CORPORATE FINANCE
LECTURE NOTES: PACKET 1

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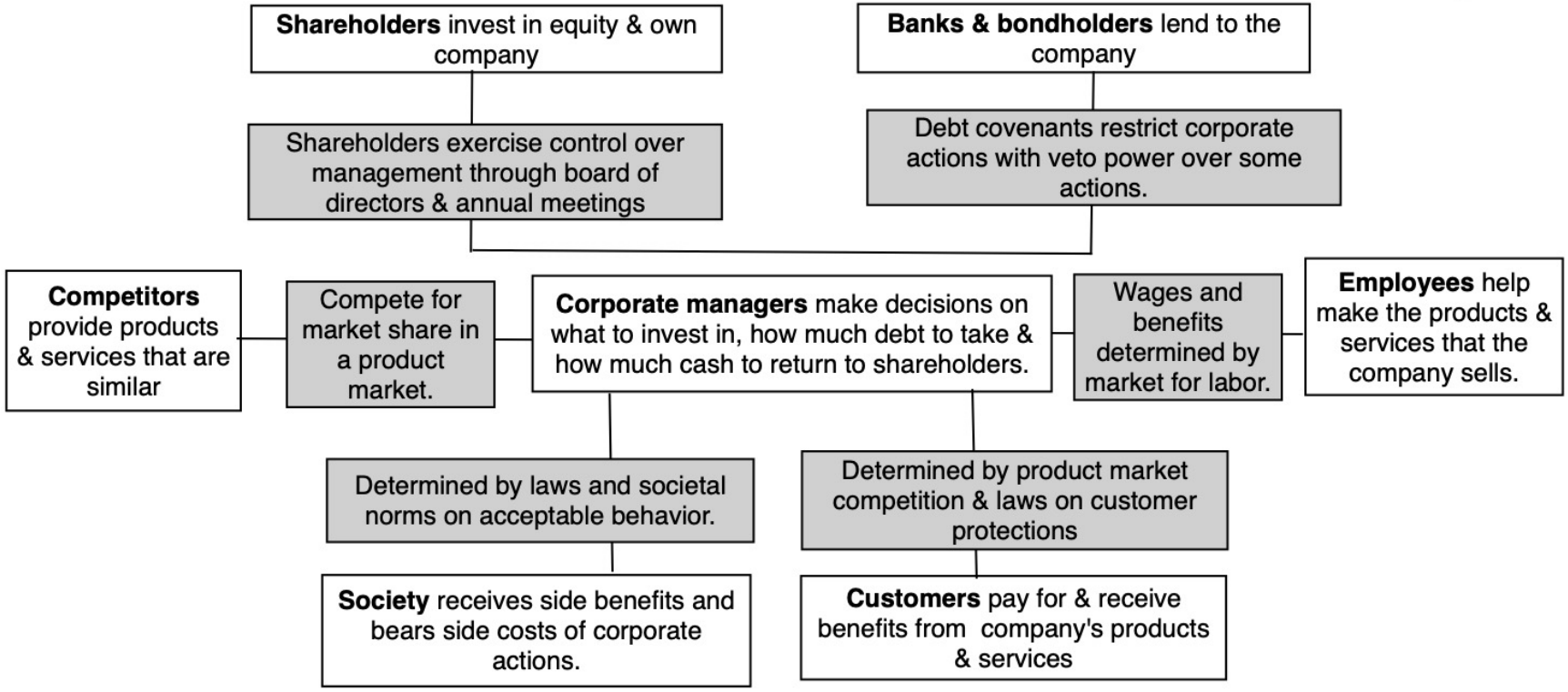
THE OBJECTIVE IN CORPORATE FINANCE

"If you don't know where you are going, it does not matter how you get there"

THE END GAME IN BUSINESS?

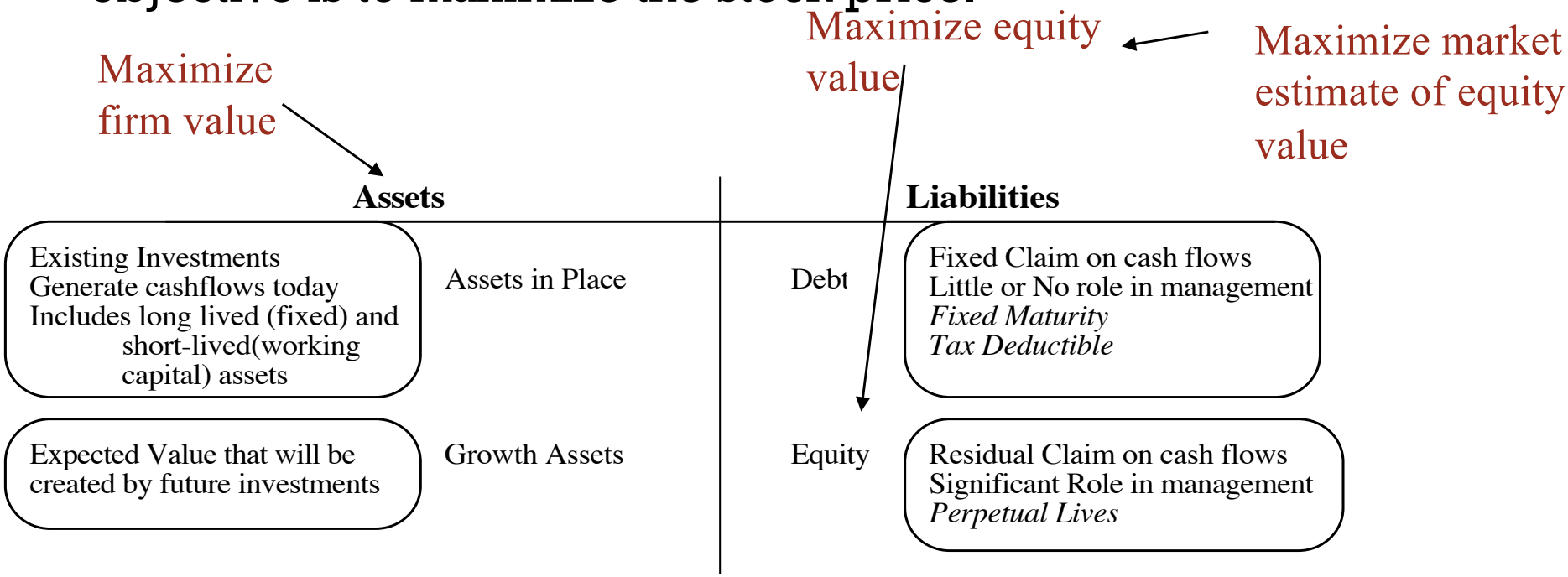
- Businesses have always struggled with mission statements. Put simply, what should the end game of a business?
  - The simplest and most pragmatic answer is that it is to sell products and services that customers want, while generating the most they can in profits for their owners, over the long term.
  - The pushback, often from non-business critics, has been that businesses should also serve society, not just minimizing social costs but also providing social benefits.
- In recent years, that pushback has found backing within business, with movements to expand business missions:
  - To put sustainability (climate? product? business?) first
  - To maximize the value to all stakeholders, not just owners
  - To incorporate environmental, social and governance goals

A BUSINESS HAS MANY STAKEHOLDERS...

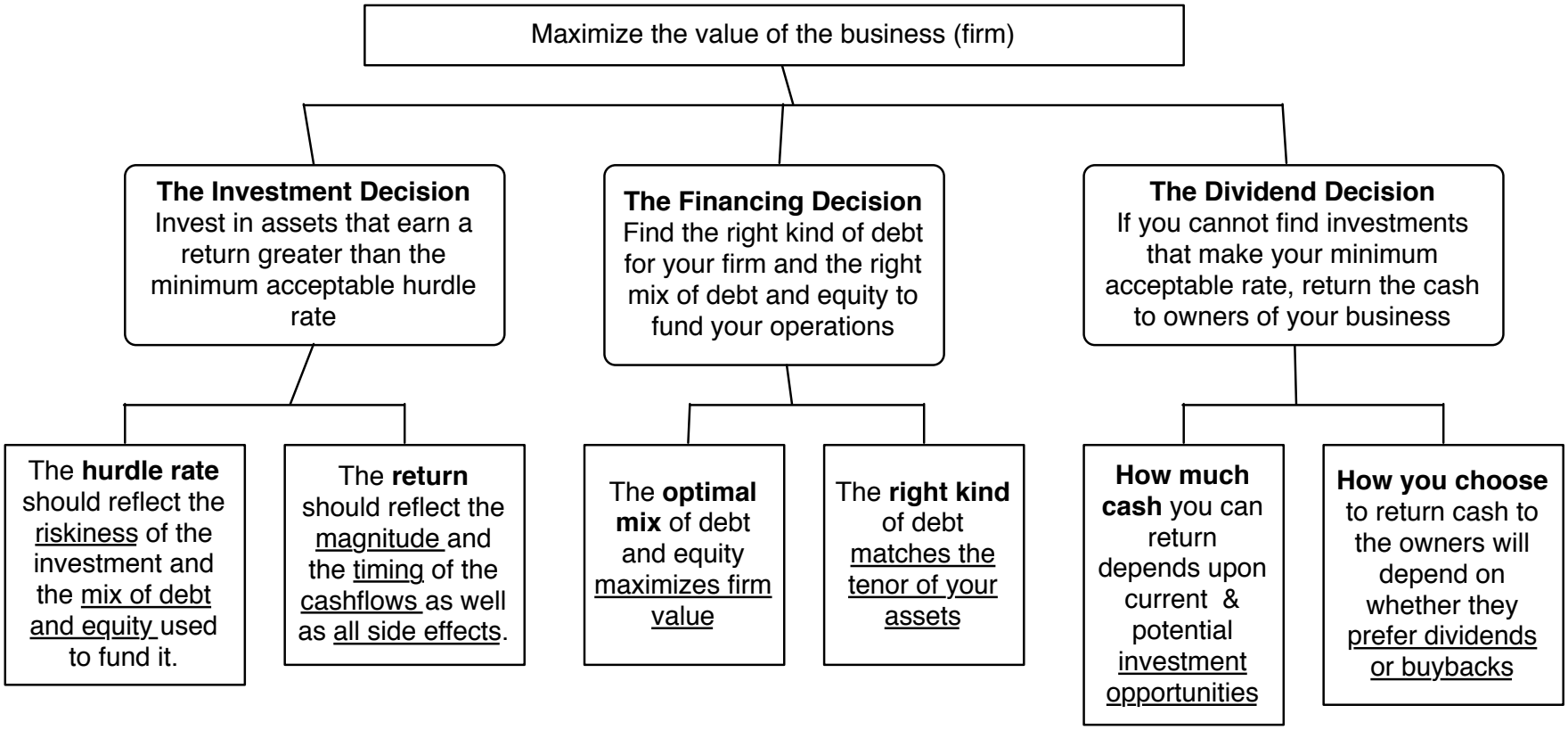


IN RUNNING A BUSINESS, ONE OF THESE STAKEHOLDERS HAS TO BE GIVEN PRIMACY...

- 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.



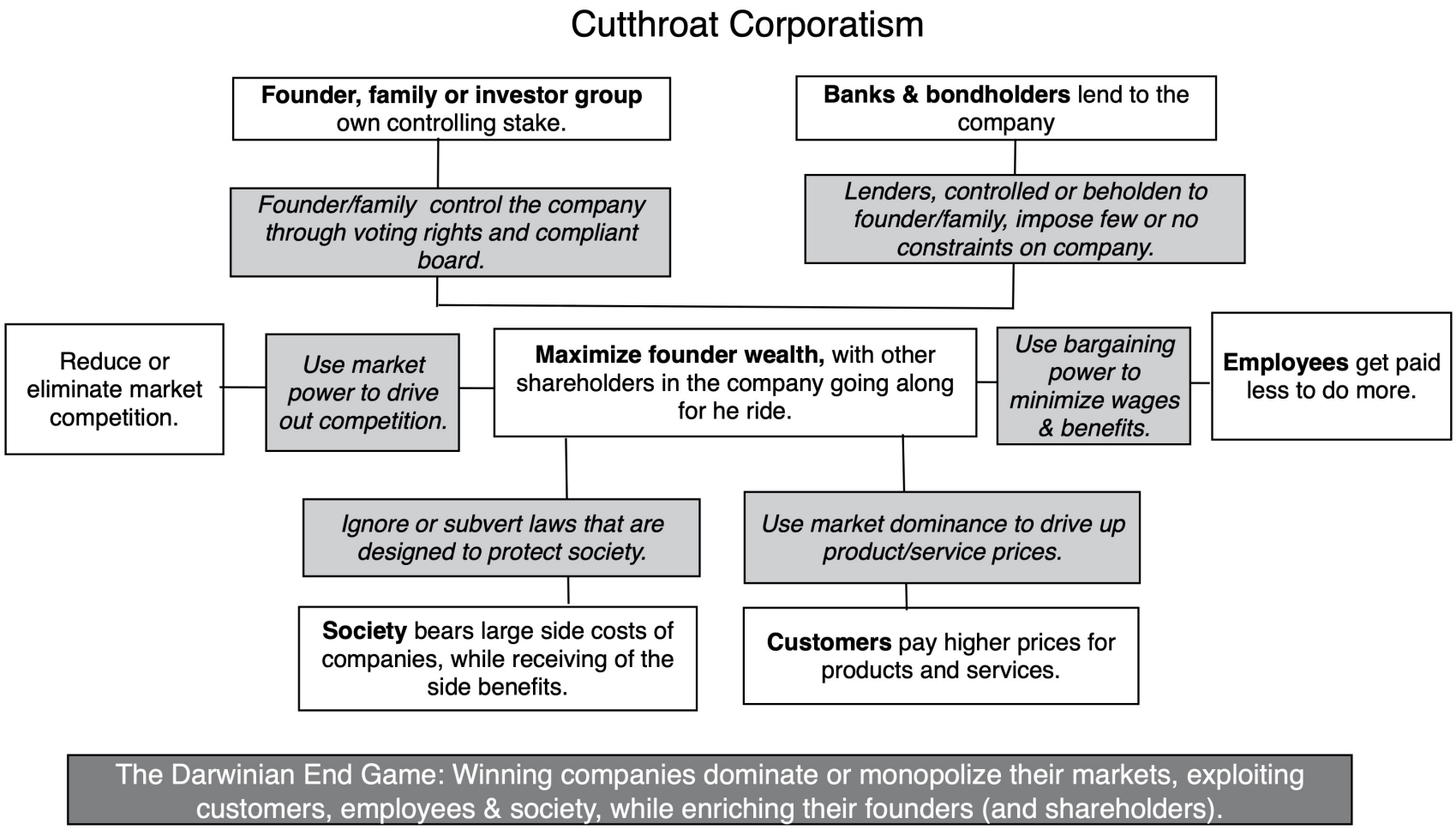
GIVING CORPORATE FINANCE ITS FOCUS...



WHY CORPORATE FINANCE FOCUSES ON MAXIMIZING STOCKHOLDER WEALTH.

- You can **have only one objective**, i.e., one interest group, whose interests get placed first.
  - Corporate finance picks shareholders because they have a residual claim, whereas every other claimholder has a contractual claim that they can negotiate to protect their interests.
- If the company is traded, **the stock price gets chosen** as the optimizing metric because:
  - Stock price is easily observable and constantly updated
  - If investors are rational, stock prices reflect the wisdom of decisions, short term and long term, instantaneously.

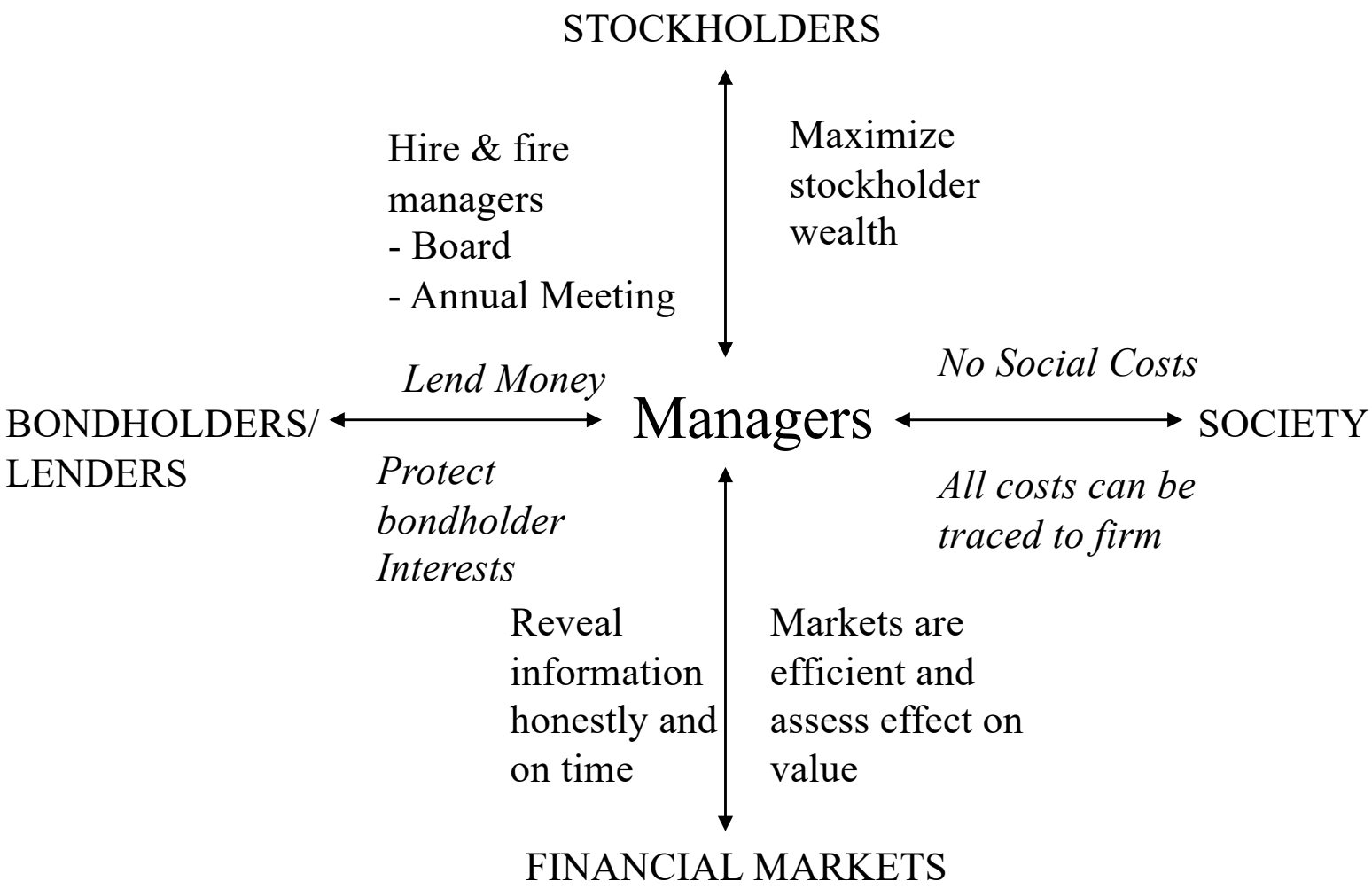
THE STRAWMAN VERSION: CUTTHROAT CORPORATISM



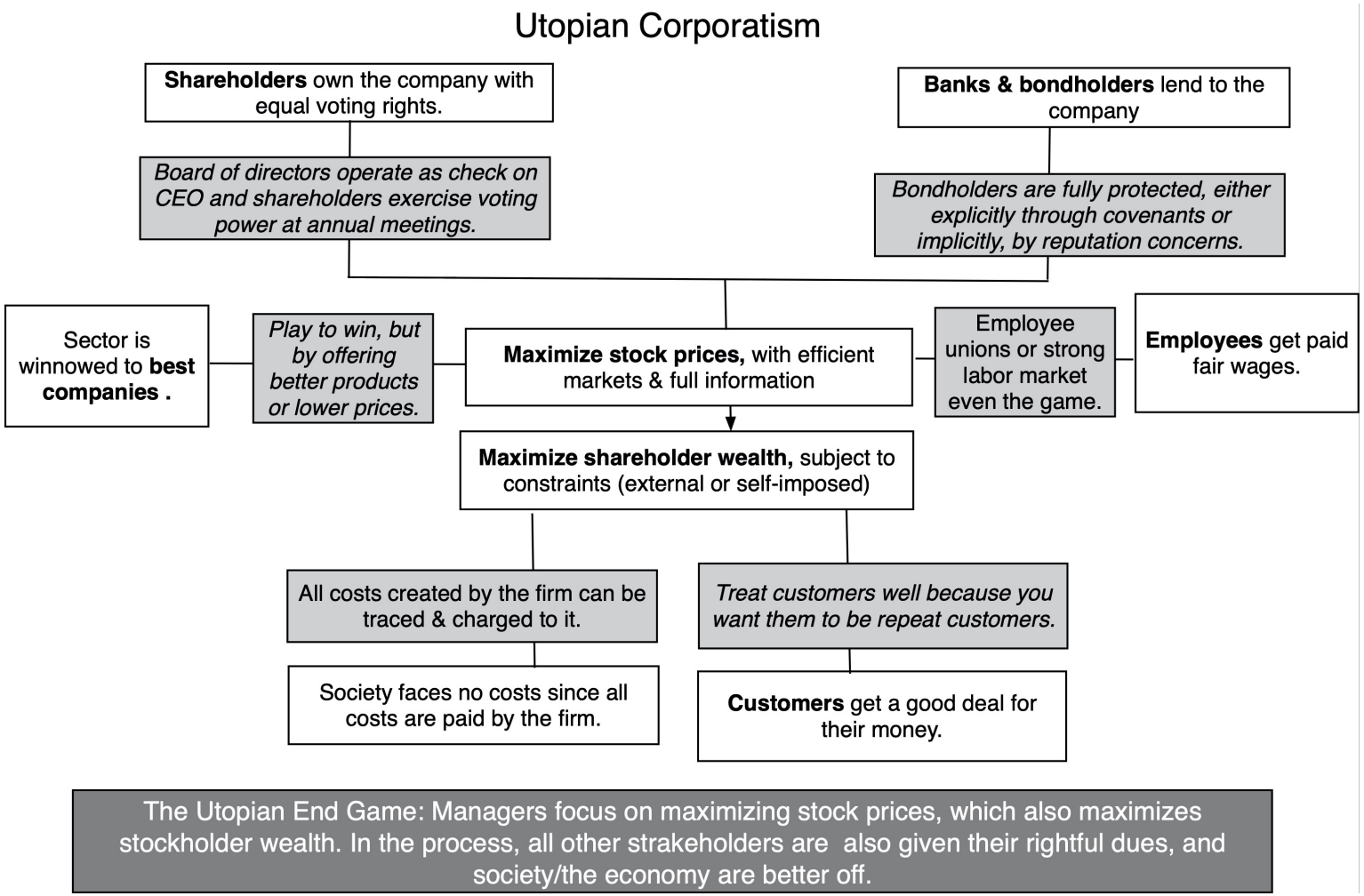
REAL CHOICES OR FALSE ONES?

- Maximizing stock price is **not incompatible with meeting employee needs/objectives.** In particular:
  - Employees are often stockholders in many firms
  - Firms that maximize stock price generally are profitable firms that can afford to treat employees well.
- Maximizing stock price does not mean **that customers are not critical to success.** In most businesses, keeping customers happy is the route to stock price maximization.
- Maximizing stock price does not imply **that a company has to be a social outlaw.** Companies that consistently flout social norms will find themselves losing business and facing regulation/targeted taxes.

THE CLASSICAL OBJECTIVE FUNCTION

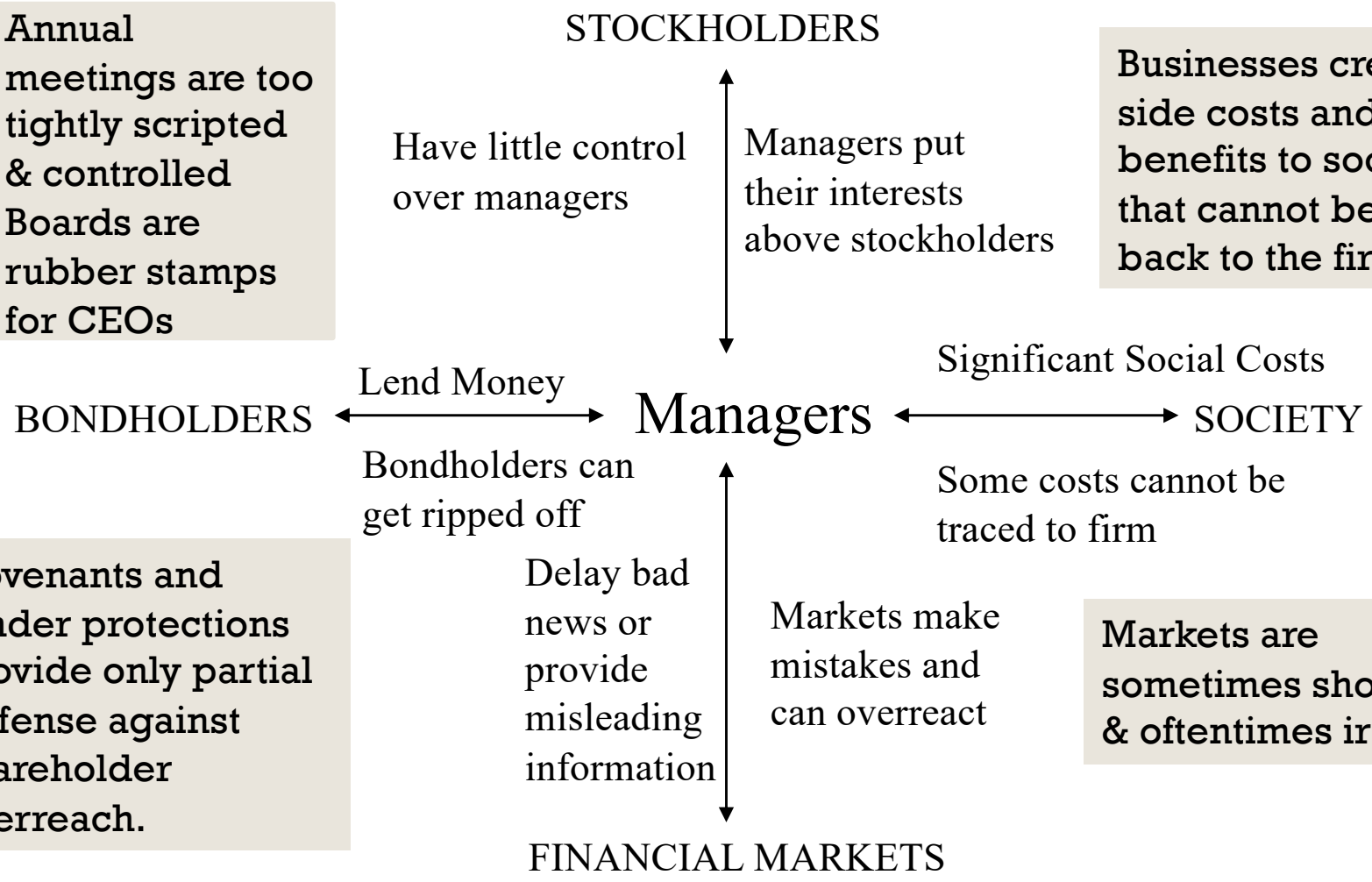


UTOPIAN CORPORATISM



SO THIS IS WHAT CAN GO WRONG...

1. Annual meetings are too tightly scripted & controlled
2. Boards are rubber stamps for CEOs



Businesses create side costs and side benefits to society that cannot be traced back to the firm.

Covenants and lender protections provide only partial defense against shareholder overreach.

Markets are sometimes short term & oftentimes irrational.

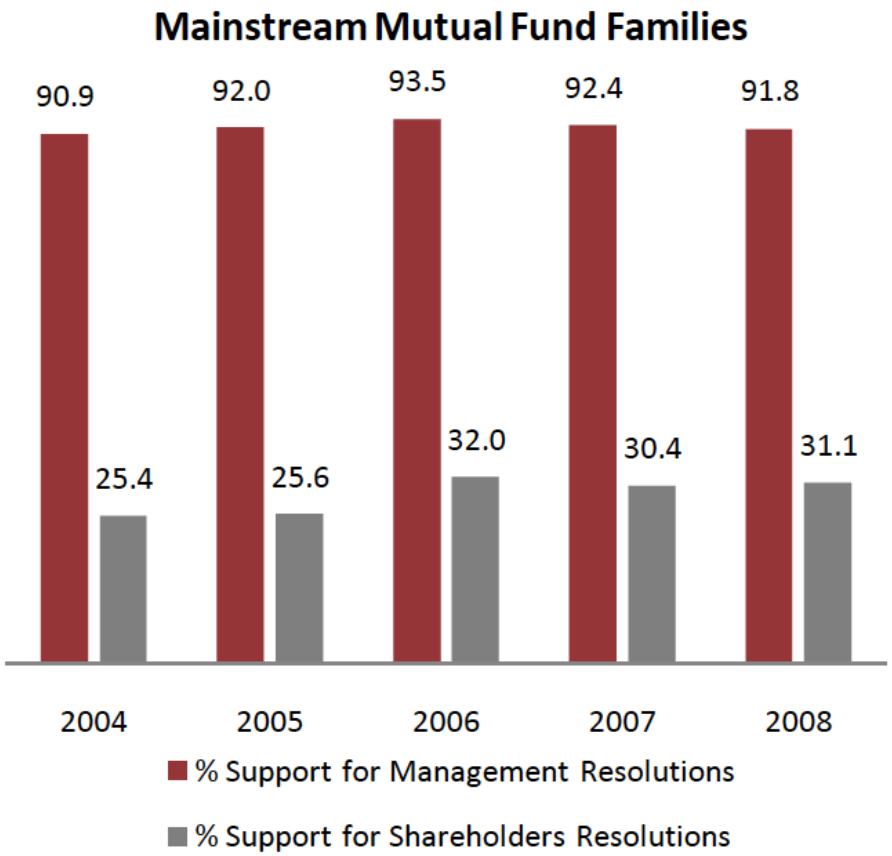
I. STOCKHOLDER INTERESTS VS. MANAGEMENT INTERESTS

- **In theory**: The stockholders have significant control over management. The two mechanisms for disciplining management are the annual meeting and the board of directors. Specifically, we assume that
  - Stockholders who are dissatisfied with managers **can not only express their disapproval** at the annual meeting, but **can also use their voting power** at the meeting to keep managers in check.
  - The board of directors **plays its true role of representing stockholders** and acting as a check on management.
- **In Practice**: Neither mechanism is as effective in disciplining management as theory posits.

THE ANNUAL MEETING AS A DISCIPLINARY VENUE

- The power of stockholders to act at annual meetings is diluted by three factors
  - Most small stockholders **do not go to meetings** because the cost of going to the meeting exceeds the value of their holdings.
  - Incumbent management starts off with a clear advantage when it comes to **the exercise of proxies.** Proxies that are not voted becomes votes for incumbent management.
  - For large stockholders, **the path of least resistance, when confronted by managers that they do not like, is to vote with their feet**, or do nothing, if they are passive investors (index funds)
- Annual meetings are also **tightly scripted and controlled events**, making it difficult for outsiders and rebels to bring up issues that are not to the management's liking.

AND INSTITUTIONAL INVESTORS GO ALONG WITH INCUMBENT MANAGERS...



BOARDS OF DIRECTORS ARE OFTEN RUBBER STAMPS...

- **CEOs pick directors**: A 1992 survey by Korn/Ferry revealed that 74% of companies relied on recommendations from the CEO to come up with new directors and only 16% used an outside search firm. While that number has decreased in recent years, CEOs still determine who sits on their boards. While more companies have outsiders involved in picking directors now, CEOs exercise significant influence over the process.
- **Directors don't have big equity stakes**: Directors often hold only token stakes in their companies. Most directors in companies today still receive more compensation as directors than they gain from their stockholdings. While share ownership is up among directors today, they usually get these shares from the firm (rather than buy them).
- **And some directors are CEOs of other firms**: Many directors are themselves CEOs of other firms. Worse still, there are cases where CEOs sit on each other's boards.

AND LACK THE EXPERTISE (AND THE WILLINGNESS) TO ASK THE NECESSARY TOUGH QUESTIONS..

- **Robert's Rules of Order?** In most boards, the CEO continues to be the chair. Not surprisingly, the CEO sets the agenda, chairs the meeting and controls the information provided to directors.
- **Be a team player?** The search for consensus overwhelms any attempts at confrontation.
- **The CEO as authority figure**: Studies of social psychology have noted that loyalty is hardwired into human behavior. While this loyalty is an important tool in building up organizations, it can also lead people to suppress internal ethical standards if they conflict with loyalty to an authority figure. In a board meeting, the CEO generally becomes the authority figure.

THE WORST BOARD EVER? 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 CALPERS TESTS FOR INDEPENDENT BOARDS

- Calpers, the California Employees Pension fund, suggested three tests in 1997 of an independent board:
  - Are a majority of the directors **outside directors**?
  - Is the **chairman of the board independent** of the company (and not the CEO of the company)?
  - Are the **compensation and audit committees** composed entirely of outsiders?
- Disney was the only S&P 500 company to fail all three tests.

BUSINESS WEEK PILES ON... THE WORST BOARDS IN 1997..

THE WORST BOARDS OF DIRECTORS

BW RANK	OVERALL SCORE	SURVEY SCORE	ANALYSIS SCORE	DETAILS	BOARD PERFORMANCE POLL				GOVERNANCE GUIDELINE ANALYSIS		
					SHAREHOLDER ACCOUNTABILITY	BOARD QUALITY	BOARD INDEPENDENCE	CORPORATE PERFORMANCE	SHAREHOLDER ACCOUNTABILITY	BOARD QUALITY	BOARD INDEPENDENCE
1. DISNEY	10.3	1.8	8.5	Investors decry board for conflicts; many directors own little if any stock	3.3	4.3	2.0	5.8	–0.4	2.8	2.2
2. AT&T	10.9	–16.6	27.5	Investors scorn board for failing to control succession, not ousting CEO	3.0	4.2	3.5	2.8	2.0	5.2	7.4
3. H.J. HEINZ	15.4	–1.1	16.5	Longtime CEO dominates insider-filled board; resists investor calls for change	2.8	3.7	2.0	4.7	4.4	6.0	1.4
4. ARCHER DANIELS MIDLAND	16.8	–12.2	29.0	Board changes fail to satisfy investors, who say directors still lack independence	2.3	2.1	1.3	3.5	5.6	7.6	5.0
5. DOW JONES	21.1	1.6	19.5	Investors disenchanted with performance; weakest attendance record of any board	2.6	4.6	2.8	2.6	6.0	0.0	5.8
6. DILLARD'S	22.0	5.0	17.0	Board loaded with insiders; lacks an outsider with retail expertise or CEO	2.0	3.0	2.0	3.5	6.4	3.2	2.0
7. ROLLINS INTERNATIONAL	22.7	1.7	21.0	Board dominated by family members and insiders; lacks nominating panel	1.0	1.0	0.0	2.0	4.0	7.6	4.4
8. OCCIDENTAL PETROLEUM	24.0	–1.5	25.5	Investors outraged over $95 million payout to CEO by cozy, aging board	1.3	2.0	1.1	2.0	2.8	6.0	5.8
9. OGDEN	27.2	4.2	23.0	Board has three consultants and a lawyer who do business with company	2.0	1.5	2.0	2.5	2.0	8.4	4.0
10. MAXXAM	28.3	4.3	24.5	Tiny board with little business experience dominated by CEO	1.5	2.0	1.0	3.5	3.6	2.0	6.0

DISNEY'S BOARD OF DIRECTORS IN 2025

guide and drive long-term value to the company.



JAMES P. GORMAN
CHAIRMAN OF THE BOARD



MARY T. BARRA
DIRECTOR SINCE 2017



AMY L. CHANG
DIRECTOR SINCE 2021



JEREMY DARROCH
DIRECTOR SINCE 2024



CAROLYN N. EVERSON
DIRECTOR SINCE 2022



MICHAEL B.G. FROMAN
DIRECTOR SINCE 2018



ROBERT A. IGER
DIRECTOR SINCE 2022



MARIA ELENA LAGOMASINO
DIRECTOR SINCE 2015



CALVIN R. MCDONALD
DIRECTOR SINCE 2021



DERICA W. RICE
DIRECTOR SINCE 2019

APPLICATION TEST: WHO'S ON BOARD?

- Look at the board of directors for your firm.
  - How many of the directors are **inside directors** (Employees of the firm, ex-managers)?
  - Is there any information on **how independent** the directors in the firm are from the managers?
- Are there any external measures of the quality of corporate governance of your firm?
  - Yahoo! Finance now reports on a **corporate governance score** for firms, where it ranks firms against the rest of the market and against their sectors.
- Is there tangible evidence that your board acts independently of management?
  - **Check news stories** to see if there are actions that the CEO has wanted to take that the board has stopped him or her from taking or at least slowed him or her down.

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

MANAGERIAL SELF INTEREST OR STOCKHOLDER WEALTH? OVERPAYING ON TAKEOVERS!

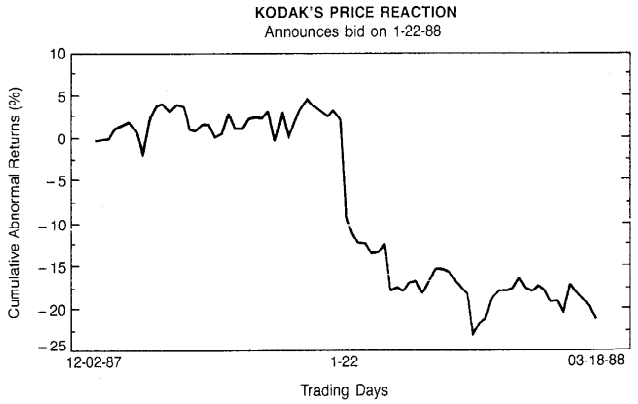
- The quickest and perhaps the most decisive way to impoverish stockholders is to **overpay on a takeover.**
- The stockholders in acquiring firms do not seem to share the enthusiasm of the managers in these firms. **Stock prices of bidding firms decline on the takeover announcements a significant proportion of the time.**
- **Many mergers do not work**, as evidenced by a number of measures:
  - The **profitability** of merged firms relative to their peer groups, does not increase after mergers.
  - An even more damning indictment is that a large number of mergers are **reversed within a few years**, which is a clear admission that the acquisitions did not work.

A CASE STUDY IN VALUE DESTRUCTION: EASTMAN KODAK & STERLING DRUGS

Kodak enters bidding war

- In late 1987, Eastman Kodak entered into a bidding war with Hoffman La Roche for Sterling Drugs, a pharmaceutical company.
- The bidding war started with Sterling Drugs trading at about $40/share.
- At $72/share, Hoffman dropped out of the bidding war, but Kodak kept bidding.
- At $89.50/share, Kodak won and claimed potential synergies explained the premium.

Kodak wins!!!!

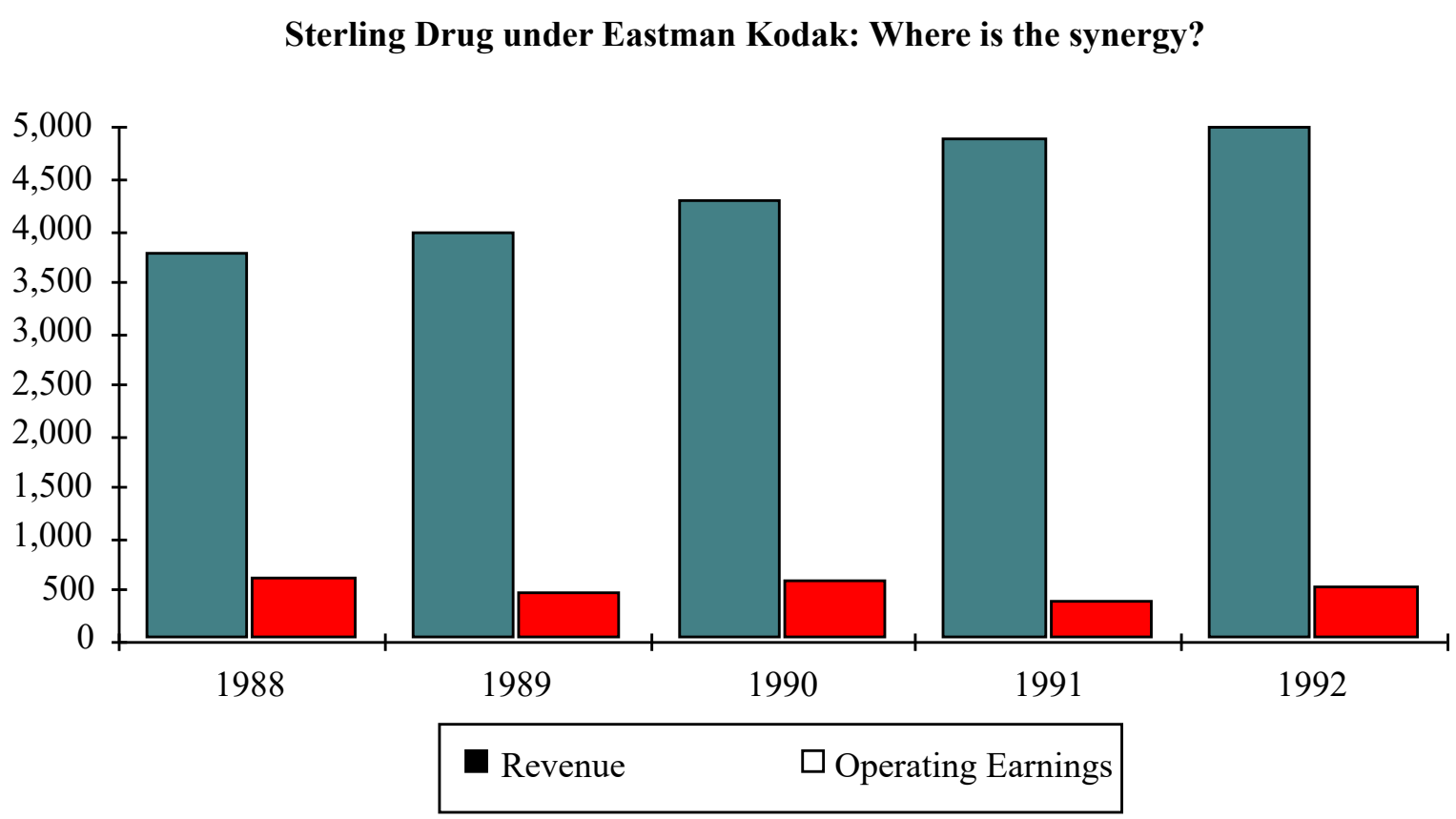


Kodak's market reaction indicates that investors expected no synergies:

Kodak's bid =	$5.1 billion
Sterling's market value 30 days prior to announcement =	3.0 billion
Premium bid	$2.1 billion
Decrease in Kodak's market value =	$2.2 billion

SOURCE: The Alcar Group, Inc.

EARNINGS AND REVENUES AT STERLING DRUGS

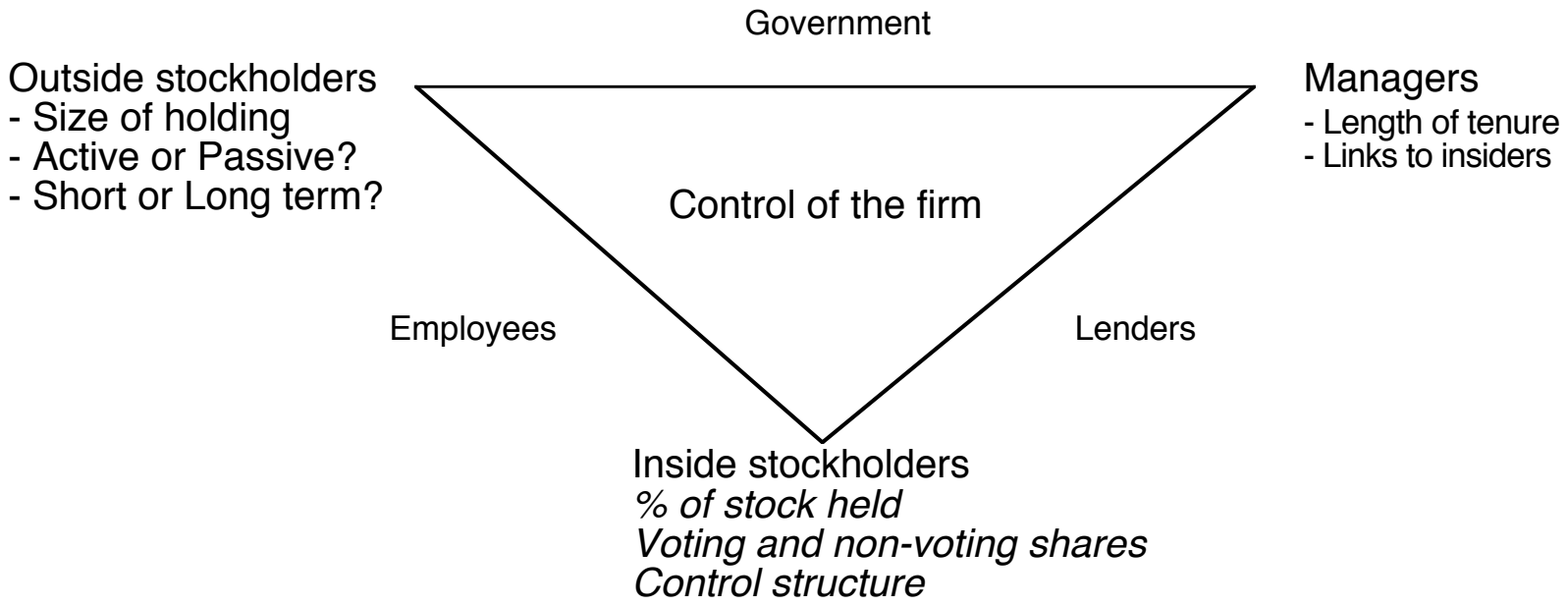


KODAK SAYS DRUG UNIT IS NOT FOR SALE … BUT…

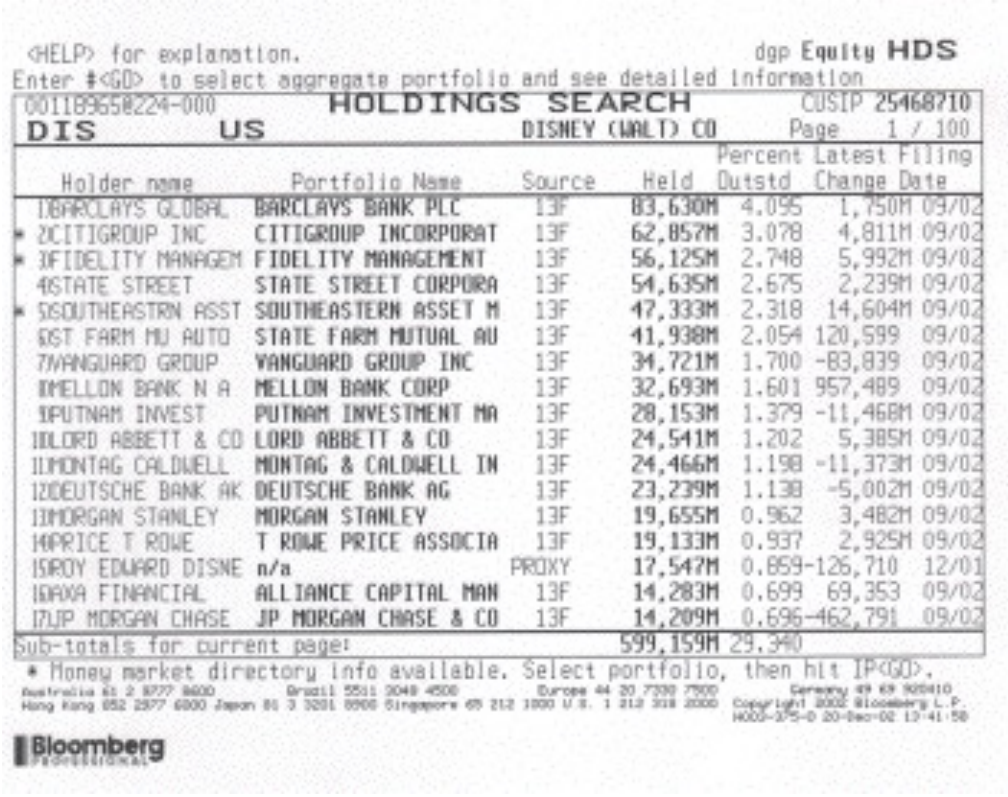
- An article in the NY Times in August of 1993 suggested that Kodak was **eager to shed its drug unit**.
  - In response, Eastman Kodak officials say they have **no plans to sell Kodak's Sterling Winthrop drug unit**.
  - Louis Mattis, Chairman of Sterling Winthrop, **dismissed the rumors** as "massive speculation, which flies in the face of the stated intent of Kodak that it is committed to be in the health business."
- A few months later…Taking a stride out of the drug business, Eastman Kodak said that the Sanofi Group, a French pharmaceutical company, **agreed to buy the prescription drug business of Sterling Winthrop for $1.68 billion.**
  - Shares of Eastman Kodak rose 75 cents yesterday, closing at $47.50 on the New York Stock Exchange.
  - Samuel D. Isaly an analyst , said the announcement was "very good for Sanofi and very good for Kodak."
  - "When the divestitures are complete, Kodak will be entirely focused on imaging," said George M. C. Fisher, the company's chief executive.
  - The rest of the Sterling Winthrop was sold to Smithkline for $2.9 billion.

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



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

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DIS US DISNEY (WALT) CO Page 1 / 100

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

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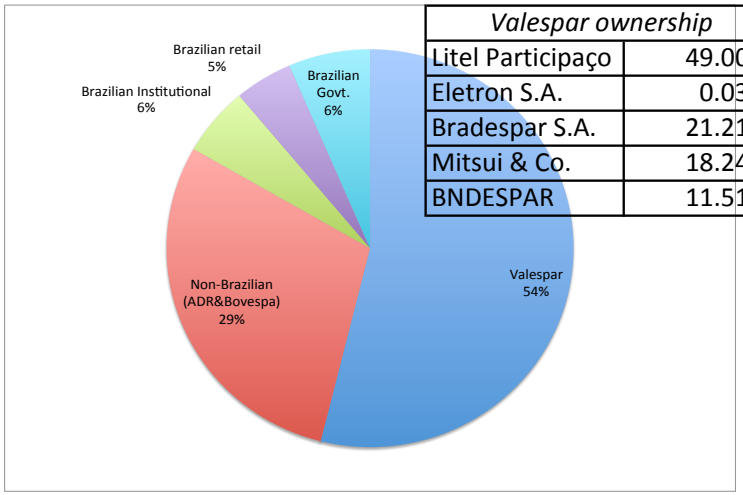
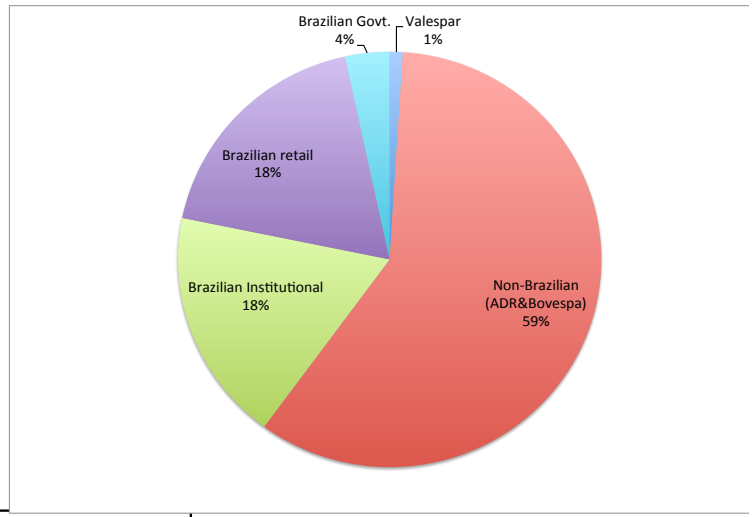
Bloomberg PROFESSIONAL

CASE 2: VOTING VERSUS NON-VOTING SHARES & GOLDEN SHARES: VALE



Valespar ownership	
Litel Participaço	49.00%
Eletron S.A.	0.03%
Bradespar S.A.	21.21%
Mitsui & Co.	18.24%
BNDESPAR	11.51%

Golden (veto) shares owned by Brazilian govt

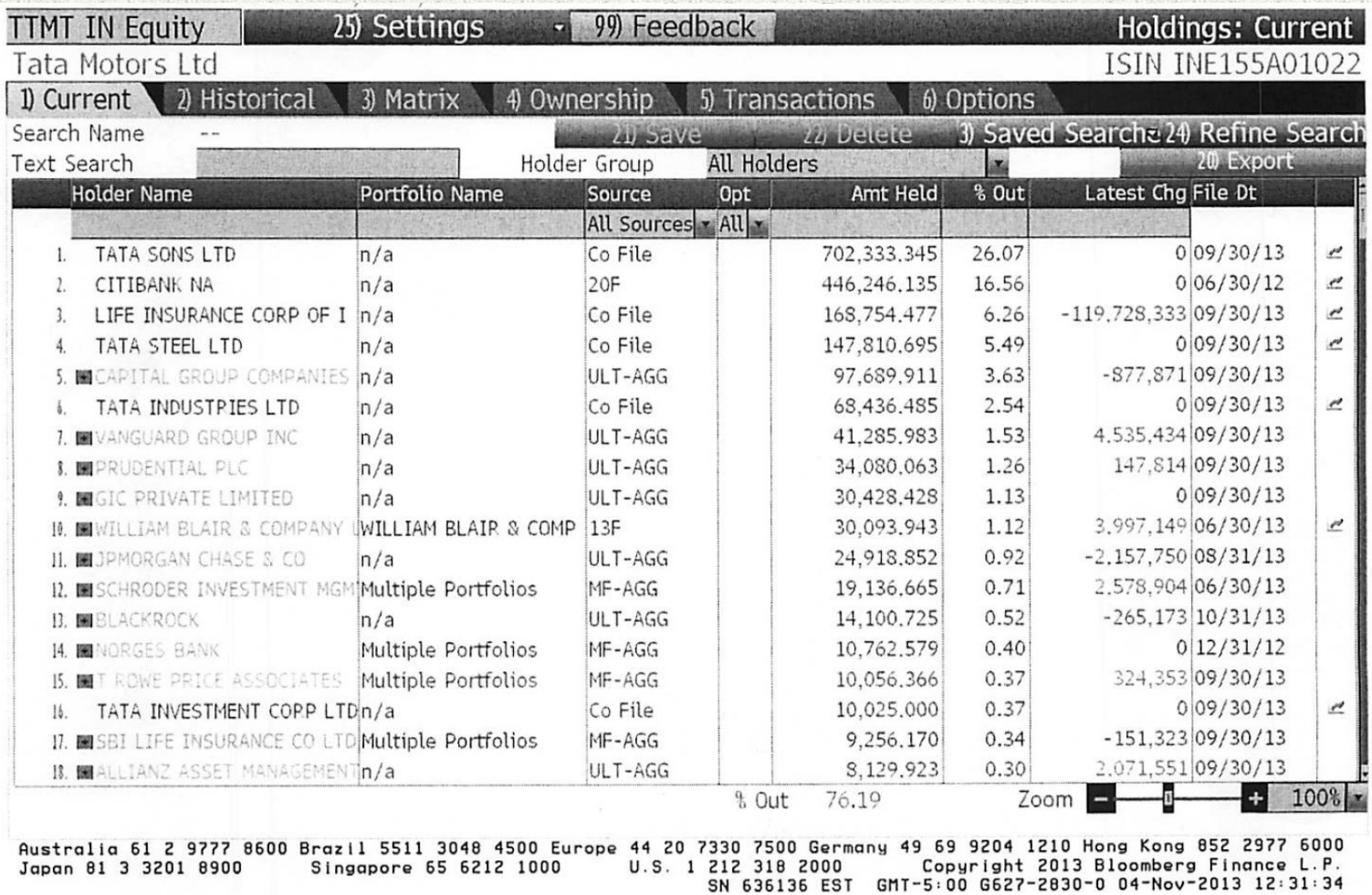


Common (voting) shares 3,172 million | Preferred (non-voting) 1,933 million

Vale Equity

Vale has eleven members on its board of directors, ten of whom were nominated by Valespar and the board was chaired by Don Conrado, the CEO of Valepar.

CASE 3: CROSS AND PYRAMID HOLDINGS
TATA MOTOR'S TOP STOCKHOLDERS IN 2013



TTMT IN Equity | 25) Settings | 99) Feedback | Holdings: Current

Tata Motors Ltd — ISIN INE155A01022

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

Search Name -- | 21) Save | 22) Delete | 23) Saved Searches | 24) Refine Search

Text Search | Holder Group: All Holders | 20) Export

	Holder Name	Portfolio Name	Source	Opt	Amt Held	% Out	Latest Chg	File Dt
			All Sources	All				
1.	TATA SONS LTD	n/a	Co File		702,333,345	26.07	0	09/30/13
2.	CITIBANK NA	n/a	20F		446,246,135	16.56	0	06/30/12
3.	LIFE INSURANCE CORP OF I	n/a	Co File		168,754,477	6.26	-119,728,333	09/30/13
4.	TATA STEEL LTD	n/a	Co File		147,810,695	5.49	0	09/30/13
5.	CAPITAL GROUP COMPANIES	n/a	ULT-AGG		97,689,911	3.63	-877,871	09/30/13
6.	TATA INDUSTRIES LTD	n/a	Co File		68,436,485	2.54	0	09/30/13
7.	VANGUARD GROUP INC	n/a	ULT-AGG		41,285,983	1.53	4,535,434	09/30/13
8.	PRUDENTIAL PLC	n/a	ULT-AGG		34,080,063	1.26	147,814	09/30/13
9.	GIC PRIVATE LIMITED	n/a	ULT-AGG		30,428,428	1.13	0	09/30/13
10.	WILLIAM BLAIR & COMPANY L	WILLIAM BLAIR & COMP	13F		30,093,943	1.12	3,997,149	06/30/13
11.	JPMORGAN CHASE & CO	n/a	ULT-AGG		24,918,852	0.92	-2,157,750	08/31/13
12.	SCHRODER INVESTMENT MGM	Multiple Portfolios	MF-AGG		19,136,665	0.71	2,578,904	06/30/13
13.	BLACKROCK	n/a	ULT-AGG		14,100,725	0.52	-265,173	10/31/13
14.	NORGES BANK	Multiple Portfolios	MF-AGG		10,762,579	0.40	0	12/31/12
15.	T ROWE PRICE ASSOCIATES	Multiple Portfolios	MF-AGG		10,056,366	0.37	324,353	09/30/13
16.	TATA INVESTMENT CORP LTD	n/a	Co File		10,025,000	0.37	0	09/30/13
17.	SBI LIFE INSURANCE CO LTD	Multiple Portfolios	MF-AGG		9,256,170	0.34	-151,323	09/30/13
18.	ALLIANZ ASSET MANAGEMENT	n/a	ULT-AGG		8,129,923	0.30	2,071,551	09/30/13

% Out 76.19 | Zoom 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 2013 Bloomberg Finance L.P.
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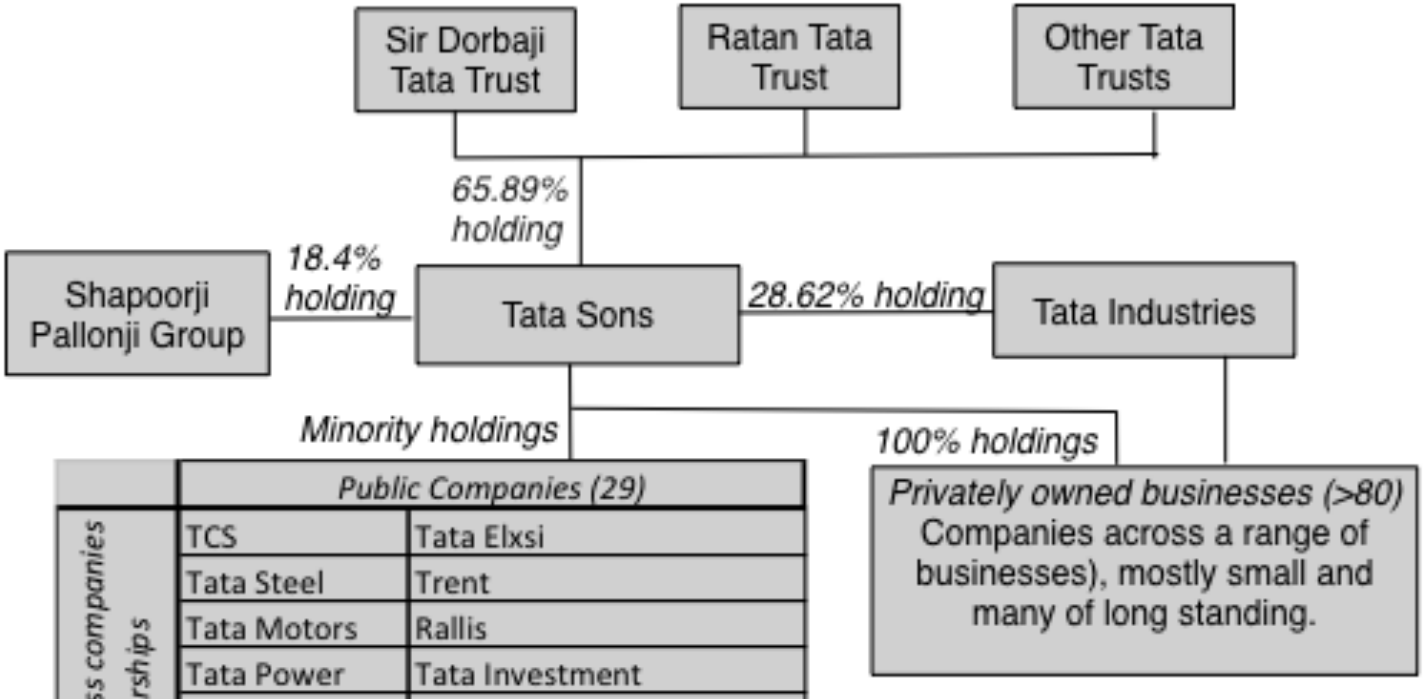
BUT IT IS A BENEVOLENT FAMILY!



CASE 4: LEGAL RIGHTS AND CORPORATE STRUCTURES: BAIDU

- **The Board**: The company has six directors, one of whom is Robin Li, who is the founder/CEO of Baidu. Mr. Li also owns a majority stake of Class B shares, which have ten times the voting rights of Class A shares, granting him effective control of the company.
- **The structure**: Baidu is a Chinese company, but it is incorporated in the Cayman Islands, its primary stock listing is on the NASDAQ and the listed company is structured as a shell company, to get around Chinese government restrictions of foreign investors holding shares in Chinese corporations.
- **The legal system**: Baidu's operating counterpart in China is structured as a Variable Interest Entity (VIE), and it is unclear how much legal power the shareholders in the shell company have to enforce changes at the VIE.

THINGS CHANGE.. DISNEY'S TOP STOCKHOLDERS IN 2009

DIS US $ ↑ 24.2422 +.7422 D 2s EquityHDS
DELAY 14:27 Vol 6,135,972 Op 23.81 Z Hi 24.34 T Lo 23.8 T ValTrd 148.014m
DIS US Equity | 95) Saved Searches | 96) Default Settings | Page 1/150 Holdings Search
Walt Disney Co/The CUSIP 25468710
21) Sources | 22) Types | 23) Countries | 24) Metro Areas | 25) Advanced Filters
Name Filter | Sort By Mkt Val

	Holder Name	Portfolio Name	Source	Mkt Val	% Out	Mkt Val Chg	File Dt
1)	JOBS STEVEN PAUL	n/a	Form 4	3.34BLN	7.46	0	5/5/06
2)	FIDELITY MANAGEMENT &	FIDELITY MANAGEMEN	13F	2.05BLN	4.58	-36.12MLN	9/30/08
3)	STATE STREET CORP	STATE STREET CORPO	13F	1.7BLN	3.79	-18.6MLN	9/30/08
4)	BARCLAYS GLOBAL INVES	BARCLAYS GLOBAL IN	13F	1.66BLN	3.70	-160.12MLN	9/30/08
5)	VANGUARD GROUP INC	VANGUARD GROUP IN	13F	1.38BLN	3.08	-6.82MLN	9/30/08
6)	SOUTHEASTERN ASSET M	SOUTHEASTERN ASSE	13F	1.12BLN	2.50	-14.03MLN	9/30/08
7)	STATE FARM MUTUAL AU	STATE FARM MUTUAL	13F	1.02BLN	2.28	0	9/30/08
8)	WELLINGTON MANAGEMEN	WELLINGTON MANAGE	13F	939.38MLN	2.09	110.6MLN	9/30/08
9)	CLEARBRIDGE ADVISORS	CLEARBRIDGE ADVISO	13F	815.91MLN	1.82	-47.04MLN	9/30/08
10)	JP MORGAN CHASE & CO	JP MORGAN CHASE &	13F	693.31MLN	1.55	-18.89MLN	9/30/08
11)	MASSACHUSETTS FINANCI	MASSACHUSETTS FINA	13F	682.16MLN	1.52	112.29MLN	9/30/08
12)	BANK OF NEW YORK MELL	BANK OF NEW YORK	13F	681.68MLN	1.52	-57.13MLN	9/30/08
13)	NORTHERN TRUST CORP	NORTHERN TRUST CO	13F	610.26MLN	1.36	-4.81MLN	9/30/08
14)	AXA	AXA	13F	486.28MLN	1.08	47.05MLN	9/30/08
15)	BLACKROCK INVESTMENT	BLACKROCK INVESTME	13F	476.12MLN	1.06	-47.11MLN	9/30/08
16)	JENNISON ASSOCIATES L	JENNISON ASSOCIATE	13F	428.85MLN	0.96	-102.77MLN	9/30/08
17)	T ROWE PRICE ASSOCIAT	T ROWE PRICE ASSOC	13F	351.61MLN	0.78	-9.94MLN	9/30/08

26) Latest Chg | 27) Hist Held % Out on Page 41.12

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Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2009 Bloomberg Finance L.P.
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II. STOCKHOLDERS' OBJECTIVES VS. BONDHOLDERS' OBJECTIVES

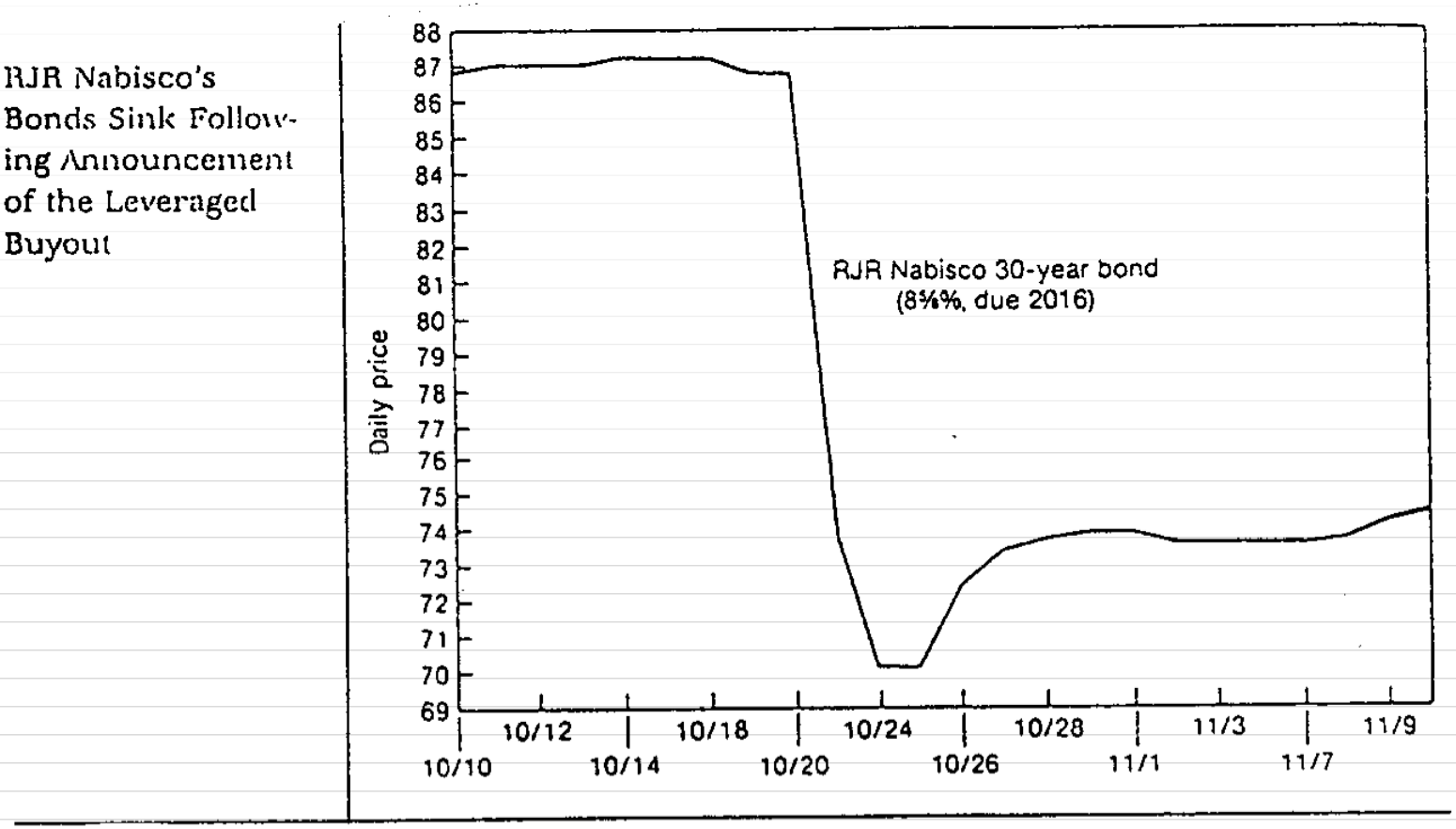
- **In theory**: There is no conflict of interests between stockholders and bondholders.
- **In practice**: Stockholders and bondholders have different objectives. Bondholders are concerned most about safety and ensuring that they get paid their claims. Stockholders are more likely to think about upside potential.

EXAMPLES OF THE CONFLICT..

- **A dividend/buyback surge**: When firms pay cash out as dividends, lenders to the firm are hurt and stockholders may be helped. This is because the firm becomes riskier without the cash.
- **Risk shifting**: When a firm takes riskier projects than those agreed to at the outset, lenders are hurt. Lenders base interest rates on their perceptions of how risky a firm's investments are. If stockholders then take on riskier investments, lenders will be hurt.
- **Borrowing more on the same assets**: If lenders do not protect themselves, a firm can borrow more money and make all existing lenders worse off.

AN EXTREME EXAMPLE: UNPROTECTED LENDERS?

RJR Nabisco's Bonds Sink Following Announcement of the Leveraged Buyout



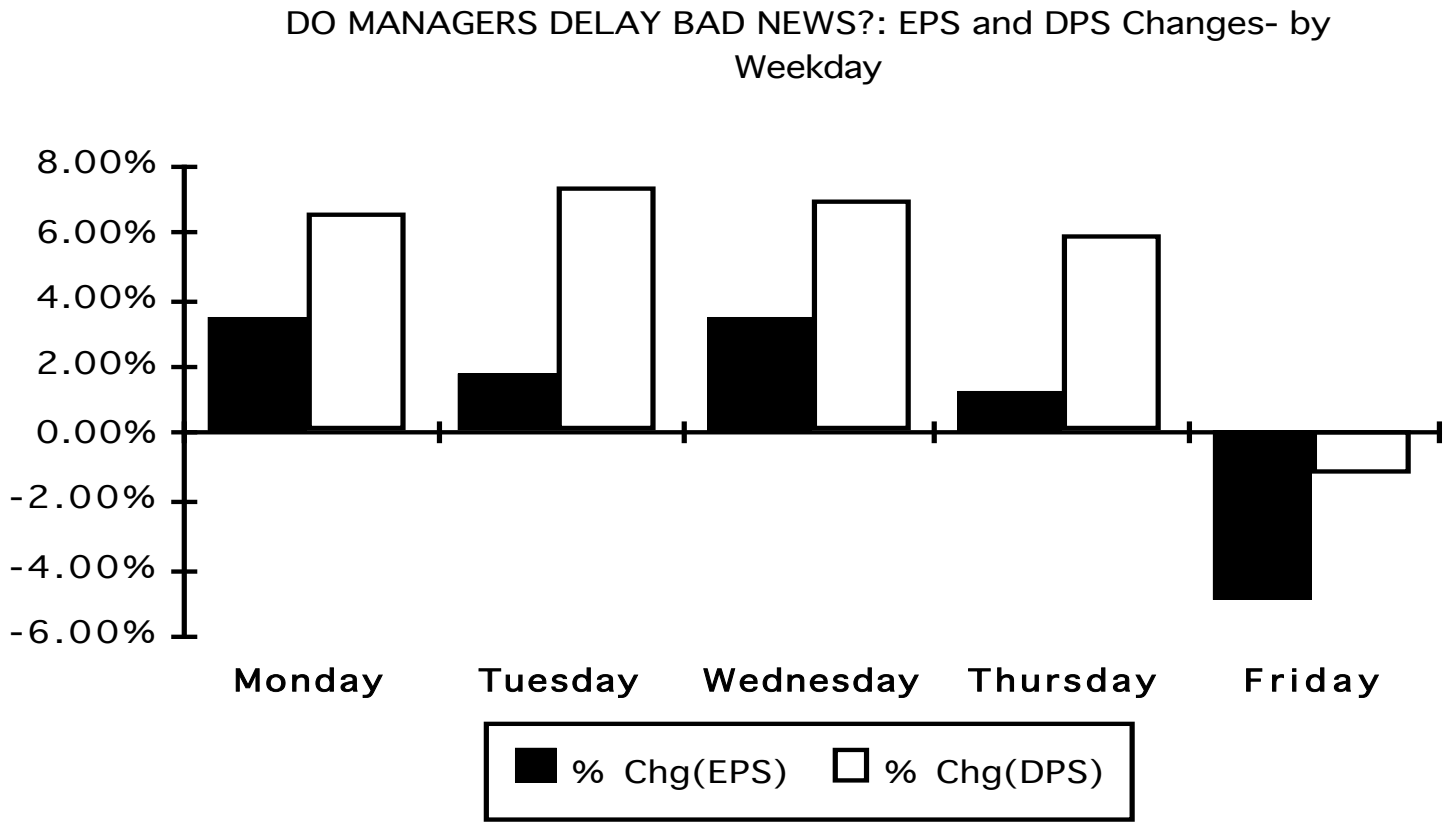
III. FIRMS AND FINANCIAL MARKETS

- **In theory**: Financial markets are efficient. Managers convey information honestly and and in a timely manner to financial markets, and financial markets make reasoned judgments of the effects of this information on 'true value'. As a consequence-
  - A company that **invests in good long-term projects** will be rewarded.
  - **Short term accounting gimmicks** will not lead to increases in market value.
  - Stock price performance is a **good measure of company performance.**
- **In practice**: There are some holes in the 'Efficient Markets' assumption.

MANAGERS CONTROL THE RELEASE OF INFORMATION TO THE GENERAL PUBLIC

- **Information management (timing and spin):** Information (especially negative) is sometimes suppressed or delayed by managers seeking a better time to release it. When the information is released, firms find ways to "spin" or "frame" it to put themselves in the best possible light.
- **Outright fraud:** In some cases, firms release intentionally misleading information about their current conditions and future prospects to financial markets.

EVIDENCE THAT MANAGERS DELAY BAD NEWS?



SOME CRITIQUES OF MARKET EFFICIENCY..

- **Investor irrationality**: The base argument is that investors are irrational, and prices often move for no reason at all. As a consequence, prices are much more volatile than justified by the underlying fundamentals. Earnings and dividends are much less volatile than stock prices.
- Manifestations of irrationality
  - **Reaction to news**: Some believe that investors overreact to news, both good and bad. Others believe that investors sometimes under react to big news stories.
  - **An insider conspiracy**: Financial markets are manipulated by insiders; Prices do not have any relationship to value.
  - **Short termism**: Investors are short-sighted, and do not consider the long-term implications of actions taken by the firm

ARE MARKETS SHORT SIGHTED AND TOO FOCUSED ON THE NEAR TERM? WHAT DO YOU THINK?

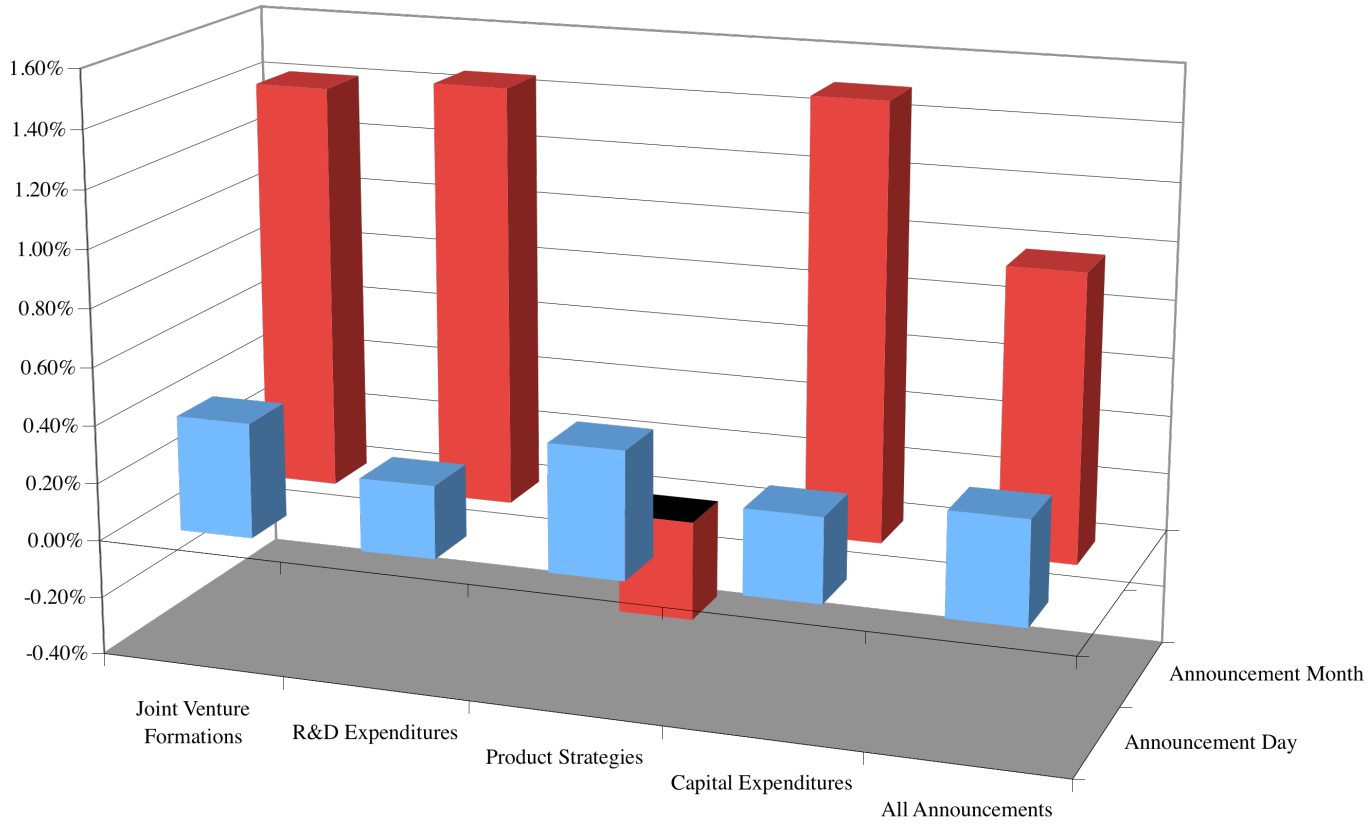
- Focusing on market prices will lead companies towards short term decisions at the expense of long-term value.
  a. I agree with the statement
  b. I do not agree with this statement
- Allowing managers to make decisions without having to worry about the effect on market prices will lead to better long term decisions.
  a. I agree with this statement
  b. I do not agree with this statement
- Neither managers nor markets are trustworthy. Regulations/laws should be written that force firms to make long term decisions.
  a. I agree with this statement
  b. I do not agree with this statement

ARE MARKETS SHORT TERM? SOME COUNTER (ALBEIT NOT CONCLUSIVE) EVIDENCE THAT THEY ARE NOT..

- **Value of young firms**: There are hundreds of start-up and small firms, with no earnings expected in the near future, that raise money on financial markets. Why would a myopic market that cares only about short-term earnings attach high prices to these firms?
- **Current earnings vs Future growth**: If the evidence suggests anything, it is that markets do not value current earnings and cashflows enough and value future earnings and cashflows too much. After all, studies suggest that low PE stocks are under priced relative to high PE stocks
- **Market reaction to investments**: The market response to research and development and investment expenditures is generally positive.

IF MARKETS ARE SO SHORT TERM, WHY DO THEY REACT TO BIG INVESTMENTS (THAT POTENTIALLY LOWER SHORT TERM EARNINGS) SO POSITIVELY?

Market Reaction to Investment Announcements



BUT WHAT ABOUT MARKET CRISES?

- **Markets are the problem**: Many critics of markets point to market bubbles and crises as evidence that markets do not work. For instance, the market turmoil between September and December 2008 is pointed to as backing for the statement that free markets are the source of the problem and not the solution.
- **The counter**: There are two counter arguments that can be offered:
  - The 2008 crisis illustrates that **we are more dependent on functioning, liquid markets, with risk taking investors**, than ever before in history. As we saw, no government or other entity (bank, Buffett) was big enough to step in and save the day.
  - The **firms that caused the market collapse (banks, investment banks) were among the most regulated businesses** in the marketplace. If anything, their failures can be traced to their attempts to take advantage of regulatory loopholes (badly designed insurance programs… capital measurements that miss risky assets, especially derivatives)

IV. FIRMS AND SOCIETY

- **In theory**: All costs and benefits associated with a firm's decisions can be traced back to the firm.
- **In practice**: Financial decisions can create social costs and benefits (externalities).
  - A **social cost or benefit** is a cost or benefit that accrues to society as a whole and not to the firm making the decision.
    - Environmental costs (pollution, health costs, etc..)
    - Quality of Life' costs (traffic, housing, safety, etc.)
  - Examples of social benefits include:
    - creating employment in areas with high unemployment
    - supporting development in inner cities
    - creating access to goods in areas where such access does not exist

SOCIAL COSTS AND BENEFITS ARE DIFFICULT TO QUANTIFY BECAUSE ..

- **Cannot know the unknown**: They might not be known at the time of the decision. In other words, a firm may think that it is delivering a product that enhances society, at the time it delivers the product but discover afterwards that there are very large costs. (Asbestos was a wonderful product, when it was devised, light and easy to work with… It is only after decades that the health consequences came to light)
- **Eyes of the beholder**: They are 'person-specific', since different decision makers can look at the same social cost and weight them very differently.
- **Decision paralysis**: They can be paralyzing if carried to extremes.

A TEST OF YOUR SOCIAL CONSCIOUSNESS: PUT YOUR MONEY WHERE YOU MOUTH IS...

- Assume that you work for Disney and that you have an opportunity to open a store in an inner-city neighborhood. The store is expected to lose about a million dollars a year, but it will create much-needed employment in the area and may help revitalize it.
- Would you open the store?
  a. Yes
  b. No
- If yes, would you tell your stockholders and let them vote on the issue?
  a. Yes
  b. No
- If no, how would you respond to a stockholder query on why you were not living up to your social responsibilities?

PUT SIMPLY, TRADITIONAL CORPORATE FINANCIAL THEORY BREAKS DOWN WHEN ...

- **Managerial self-interest drives decision making**: The interests/objectives of the decision makers in the firm conflict with the interests of stockholders.
- **Debt holders are unprotected**: Bondholders (Lenders) are not protected against expropriation by stockholders.
- **Markets are inefficient and prices don't reflect value**: Financial markets do not operate efficiently, and stock prices do not reflect the underlying value of the firm.
- **Businesses create large side costs for society (externalities):** Significant social costs can be created as a by-product of stock price maximization.

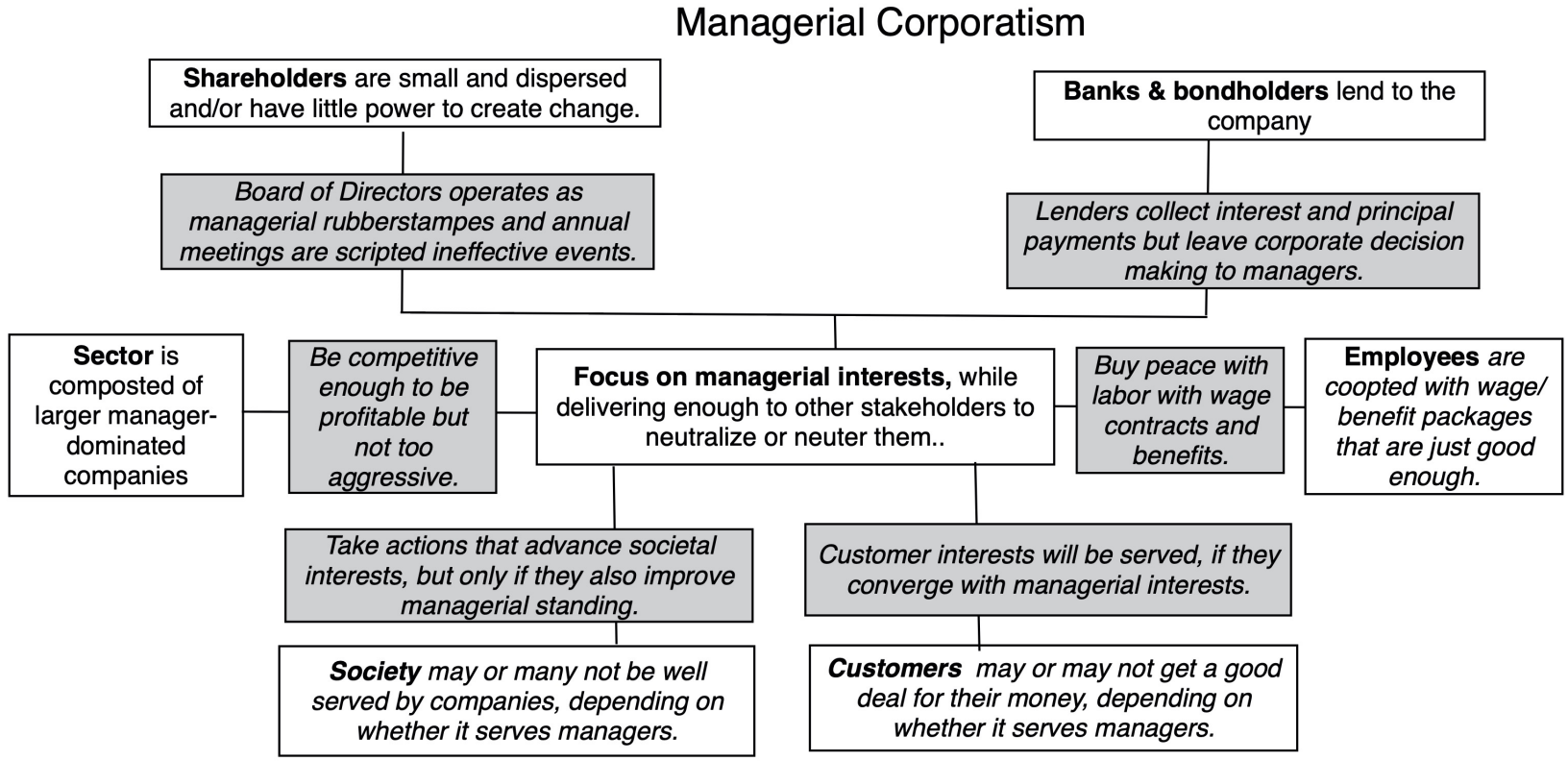
WHEN TRADITIONAL CORPORATE FINANCIAL THEORY BREAKS DOWN, THE SOLUTION IS:

- **A non stockholder-based governance system**: To choose a different mechanism for corporate governance, i.e, assign the responsibility for monitoring managers to someone other than stockholders.
- **A better objective than maximizing stock prices?** To choose a different objective for the firm, either by shifting to a different metric or stakeholder group(s).
- **Maximize stock prices but minimize side costs**: 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

I. AN ALTERNATIVE CORPORATE GOVERNANCE SYSTEM

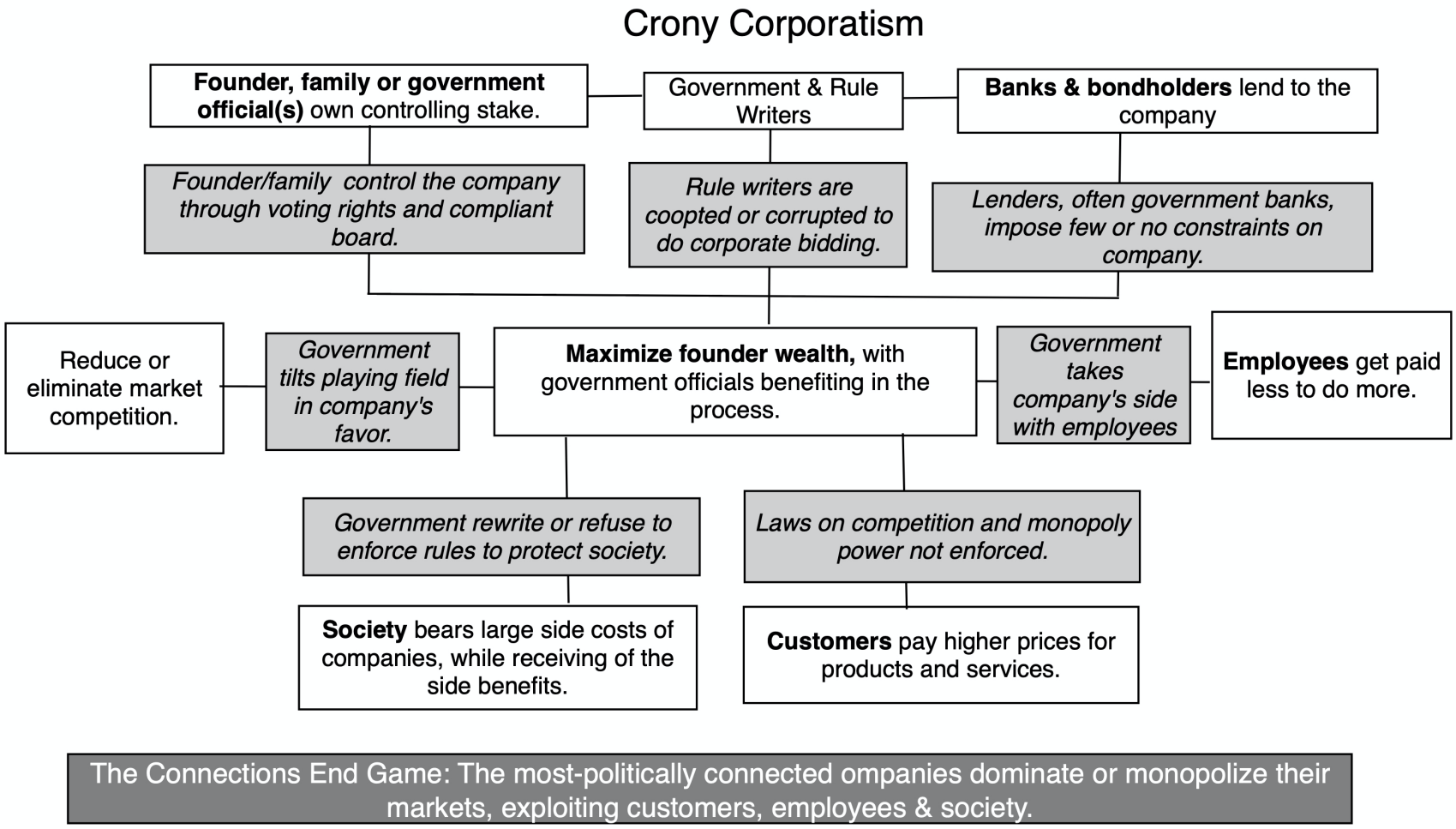
- **Germany and Japan** developed a different mechanism for corporate governance, based upon corporate cross holdings.
  - In Germany, the banks form the core of this system.
  - In Japan, it is the keiretsus
  - Other Asian countries have modeled their system after Japan, with family companies forming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

ONE END GAME: MANAGERIAL CORPORATISM



The Managerial End Game: The surviving companies are the ones that find a way to keep managers happy (either economically or with side benefits) with other stakeholders' interests being served well or badly depending on whether they converge with managerial interests.

A SKEWED VERSION: CRONY CORPORATISM



IIA. CHOOSE A DIFFERENT METRIC TO MAXIMIZE

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

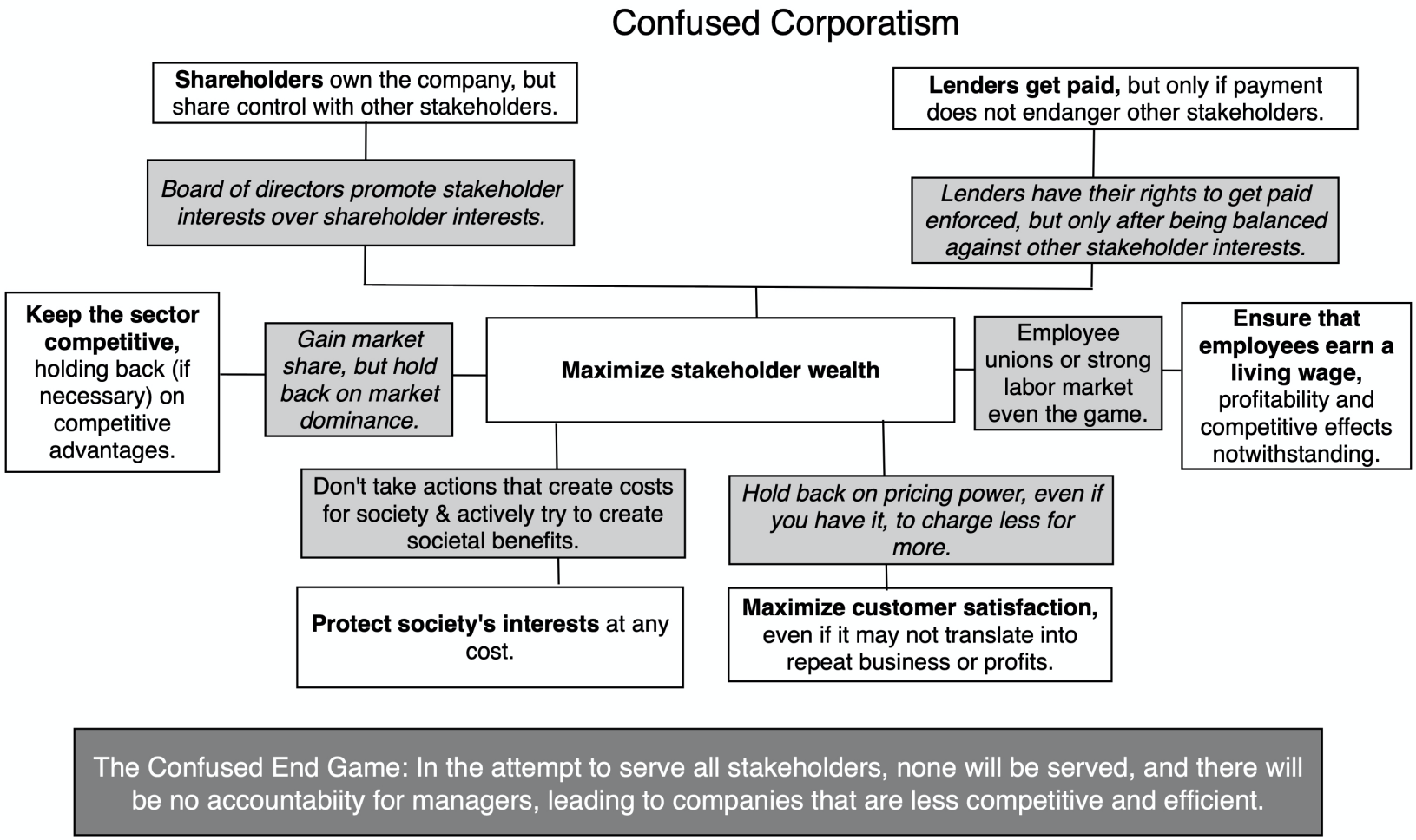
IIB. MAXIMIZE STAKEHOLDER WEALTH

- **A fairness argument**: To the extent that shareholder wealth maximization seems to, at least at first sight, put all other stakeholders in the back seat, it seems unfair.
- **An Easy Fix?** The logical response seems to be stakeholder wealth maximization, where the collective wealth of all stakeholders is maximized. That is the promise of stakeholder wealth maximization.
- **Protective response**: As corporations have found themselves losing the battle for public opinions, many CEOs and even some institutional investors seem to have bought into this idea.

THE BUSINESS ROUNDTABLE'S MESSAGE..

- While each of our individual companies serves its own corporate purpose, we share a fundamental commitment to all of our stakeholders. We commit to:
  - **Delivering value to our customers**. We will further the tradition of American companies leading the way in meeting or exceeding customer expectations.
  - **Investing in our employees**. This starts with compensating them fairly and providing important benefits. It also includes supporting them through training and education that help develop new skills for a rapidly changing world. We foster diversity and inclusion, dignity and respect.
  - **Dealing fairly and ethically with our suppliers**. We are dedicated to serving as good partners to the other companies, large and small, that help us meet our missions.
  - **Supporting the communities in which we work**. We respect the people in our communities and protect the environment by embracing sustainable practices across our businesses.
  - **Generating long-term value for shareholders**, who provide the capital that allows companies to invest, grow and innovate. We are committed to transparency and effective engagement with shareholders

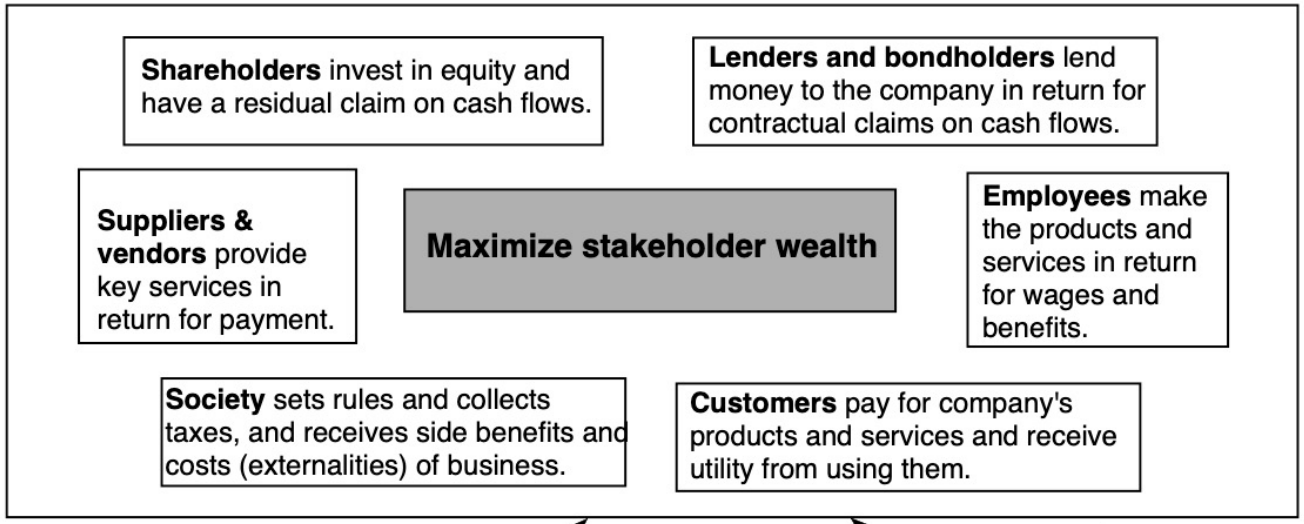
CONFUSED CORPORATISM



IF CONFUSED CORPORATISM SOUNDS LIKE A GOOD DEAL, SOME CAUTIONARY NOTES..

- **Government-owned companies**: The managers of these companies were given a laundry list of objectives, resembling in large part the listing of stakeholder objectives, and told to deliver on them all. The end results were some of the most inefficient companies on the face of the earth, with every stakeholder group feeling ill-served in the process.
- **US research universities**: These entities lack a central focus, where whose interests dominate and why shifts, depending on who you talk to and when. The end result is not just economically inefficient operations, capable of running a deficit no matter how much tuition is collection, but one where every stakeholder group feels aggrieved.

The Theocratic Trifecta



"Goodness" is inherently subjective, and any system built around it will reflect value judgments by the measurers.

Shareholder wealth comes at the expense of other stakeholders.

Scoring & disclosing how stakeholders are affected will create "better' behavior

Being good requires sacrifice, and someone has to bear the cost.

The Theocratic Trifecta

The Promise: Create a sustainable business, making sustainable products for a sustainable planet, and be more profitable and valuable at the same time.

Sustainability

The Problem: Planet, product and corporate sustainability often do not go together, and delivering on them will require sacrifice on the part of one or more stakeholders.

The Promise: A company's sustainability (E,S &G) can be measured with score, and once measured, it can be monitored, with rewards & punishments to follow.

ESG

The Problem: Measurement metrics will be flawed and gamed, and refining them will only cause more gaming. At the end, eve if ESG measures what it claims to measure, higher scores will come at a cost to both businesses and investors.

SUSTAINABILITY: OF WHAT?

- **Planet sustainability**, measuring how our actions, as consumers and businesses, affect the planet, and our collective welfare and well being. This, of course, covers everything from climate change to health care to income inequality.
- **Product sustainability,** measuring how long a product or service from a business can be used effectively, before becoming useless or waste. In a throw-away world, where planned obsolescence seems to be built into every product or service, there are consumers and governments who care about product sustainability, albeit for different reasons.
- **Business or corporate sustainability**, measuring the life of a business or company, and actions that can extend or constrict that life.

WHAT DOES A CSO DO?

CSO Role Model	*Role/Tasks*	*Training/Preparation for job*
1. Yoda	Providing vision and guidance to the companies they worked at, about the social effects of their actions, and doing so with a long-term perspective. In short, they have a better perspective than the rest of us on how the company and society would evolve over time, and advice the company on the actions that it would need to take to match that evolution.	Born brilliant and spent a decade up in a cave in the Himalayas, acquiring "wisdom" or Jedi training from Obi-wan Kenobi.
2. Jiminy Cricket	Act as corporate consciences, reminding the companies that they work for of the social effects of their actions, hoping that it prompts them to change their ways. Like Jiminy Cricket, they are usually ignored and get little glory, even in hindsight.	A past life as a pastor or a priest, with clearly defined lines between good and bad and a talent for evoking guilt.
3. PR (Mad Man)	Marketing fronts for companies, with the job of taking actions that could not remotely be argued as being good for the planet and selling them as such and stepping up during "crises" and finding someone else to blame for corporate actions.	A job in public relations, preferably working for a politician, with skills in spinning the facts.
4. Embalmer	Ensure that the company will live longer, perhaps even forever, even if it is not in the best interests of any of the stakeholders, that they should, or the planet.	Strategic consulting, preferably at a big-name consulting firm, with a matrix to guide you.

THE ESG PROMISES: MEASURABLE AND CAKE FOR ALL, WITH NO CALORIES!

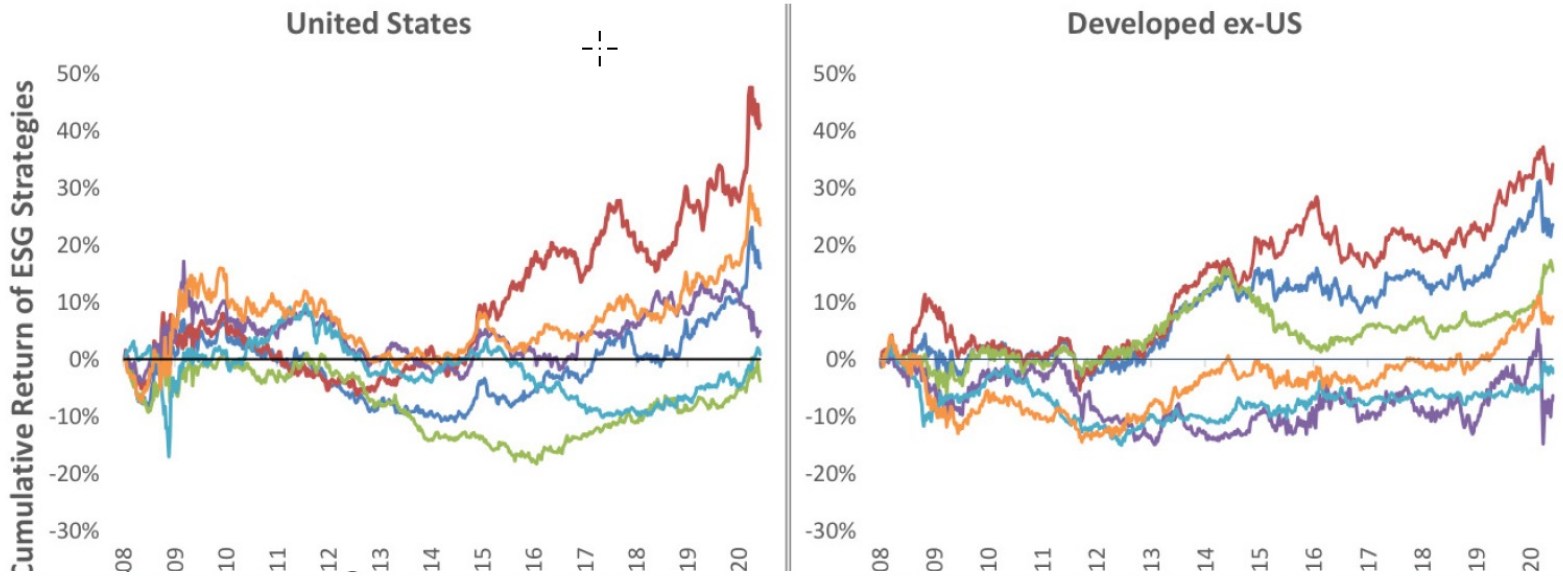
- It is measurable: Much as ESG advocates try to claim it is not about scores, it is undeniable that its growth in use has come from the scoring.
- It is good for value: For companies, the promise is that being "good" will generate higher profits for the company, at least in the long term, with lower risk, and thus make them more valuable.
- It is good for investors: For investors in these companies, the promise is that investing in "good" companies will generate higher returns than investing in "bad" or middling companies.
- It is good for society: For society, the promise is that not only would good companies help fight problems directly related to ESG, like climate change and low wages, but also counter more general problems like income inequality and healthcare crises.

ESG: THE CONTRA CASE

- **ESG is difficult (if not impossible) to measure, since goodness is in the eyes of the beholder and changes over time.** Not surprisingly, this results in (a) significant disagreements on ESG scores for the same company across different services and (b) changes in the score for a company across time from the same service.
- **The notion that increasing ESG always increases value is absurd**. It can increase value at some companies, smaller and serving niche markets (Patagonia, REI), decrease value at others (where being good costs you with no revenue gain, which is true for the vast majority of companies that spend money on ESG) or do nothing for value.
- **The notion that investing in high ESG companies will earn you alpha, risk-adjusted returns that exceed what you make, is the epitome of the "have your cake and eat it too" sales pitch** that has led ESG to where it is today. In reality, doing good will cost you, and you have to be okay with it.
- The fallback that even if ESG is not good for companies or investors, it should be pursued, because it is **good for society is also questionable**. You would be hard pressed to find a single ESG dimension where we are better off now than we were 20 years ago, when ESG was created.

THE PROBLEM WITH ESG RESEARCH: ACCIDENTAL ALPHAS!

Exhibit 3: Cumulative Returns of ESG Strategies



Jan 2008 - Jun 2020	ESG		E		S		G		ESG Momentum		Combination	
Geographic Universe	US	Dev ex-US	US	Dev ex-US	US	Dev ex-US	US	Dev ex-US	US	Dev ex-US	US	Dev ex-US
Ann. Return	1.29%	1.63%	2.89%	2.43%	-0.23%	1.07%	0.45%	-0.85%	0.15%	-0.26%	1.92%	0.48%
t-statistic	0.85	0.90	1.71	1.59	-0.05	0.70	0.40	-0.05	0.19	-0.11	1.23	0.36
CAPM Alpha	2.57%	1.63%	3.99%	2.43%	0.54%	1.08%	1.30%	-0.52%	0.06%	-0.14%	2.84%	0.53%
t-statistic	1.55	1.05	2.28	1.68	0.35	0.79	0.84	-0.23	0.04	-0.12	1.62	0.37
7 Factor Alpha	-0.33%	1.31%	0.96%	1.95%	-1.17%	1.95%	-0.22%	-1.75%	0.00%	0.86%	0.96%	0.52%
t-statistic	-0.24	0.85	0.68	1.43	-0.84	1.43	-0.16	-0.78	0.00	0.73	0.59	0.36

Source: Honey, I shrunk the ESG alpha

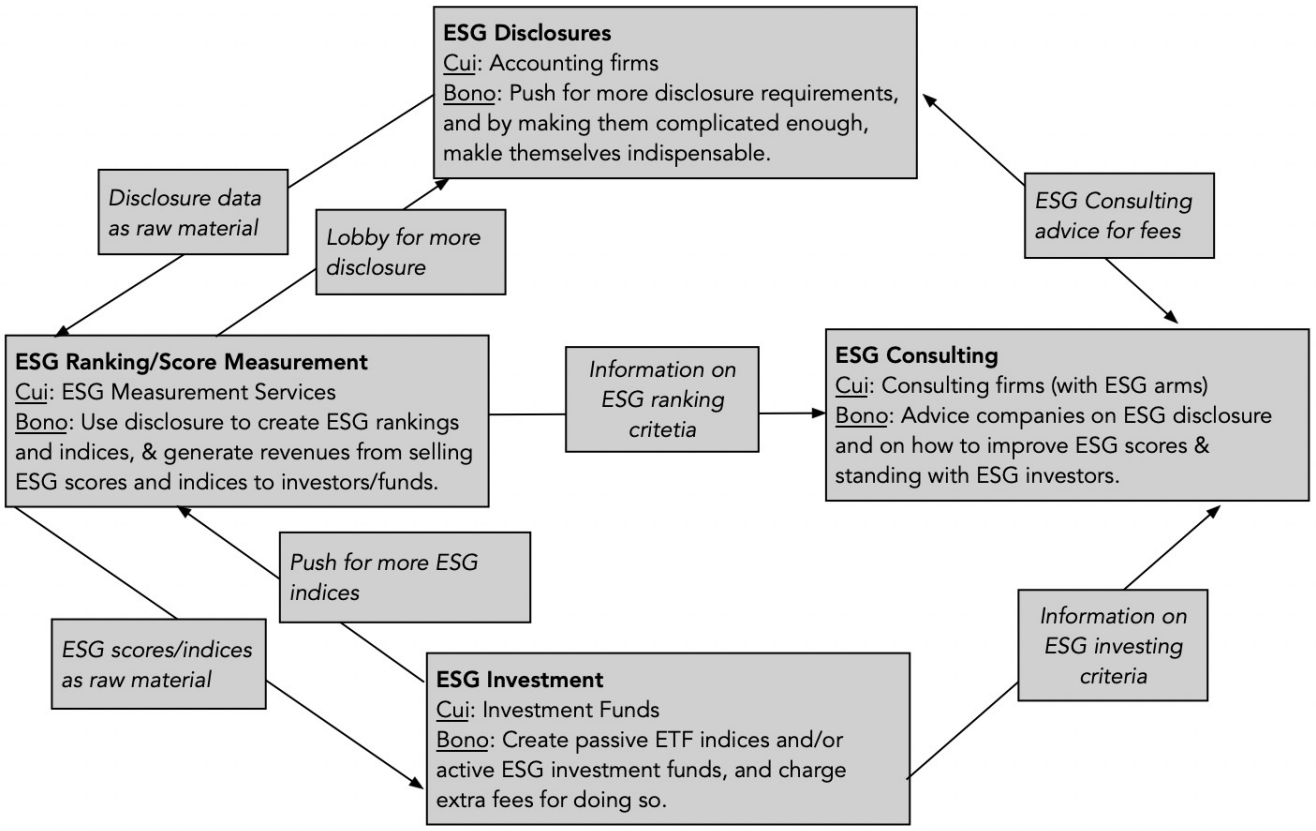
Aswath Damodaran

AND THE SOCIETAL BENEFITS ARE ILLUSORY

- There are some who argue that even if ESG is bad for companies and investors, it is good for society, because companies will treat their customers and employees better, while catering to their local communities.
- There are three fundamental flaws:
  - **Greenwashing**: ESG allows companies to sound good, while not doing good, and that it will allow for posturing and public relation ploys that do little to advance public good.
  - **Outsourcing goodness**: It makes the CEOs the arbiters of goodness and badness.
  - **Behind the curtain**: Pressuring companies to invest in the good and divest themselves or avoid the bad may only push bad behavior to less observable and monitored parts of the economy.

SO WHY IS ESG STILL BEING SOLD? CUI BONO? (WHO BENEFITS?)

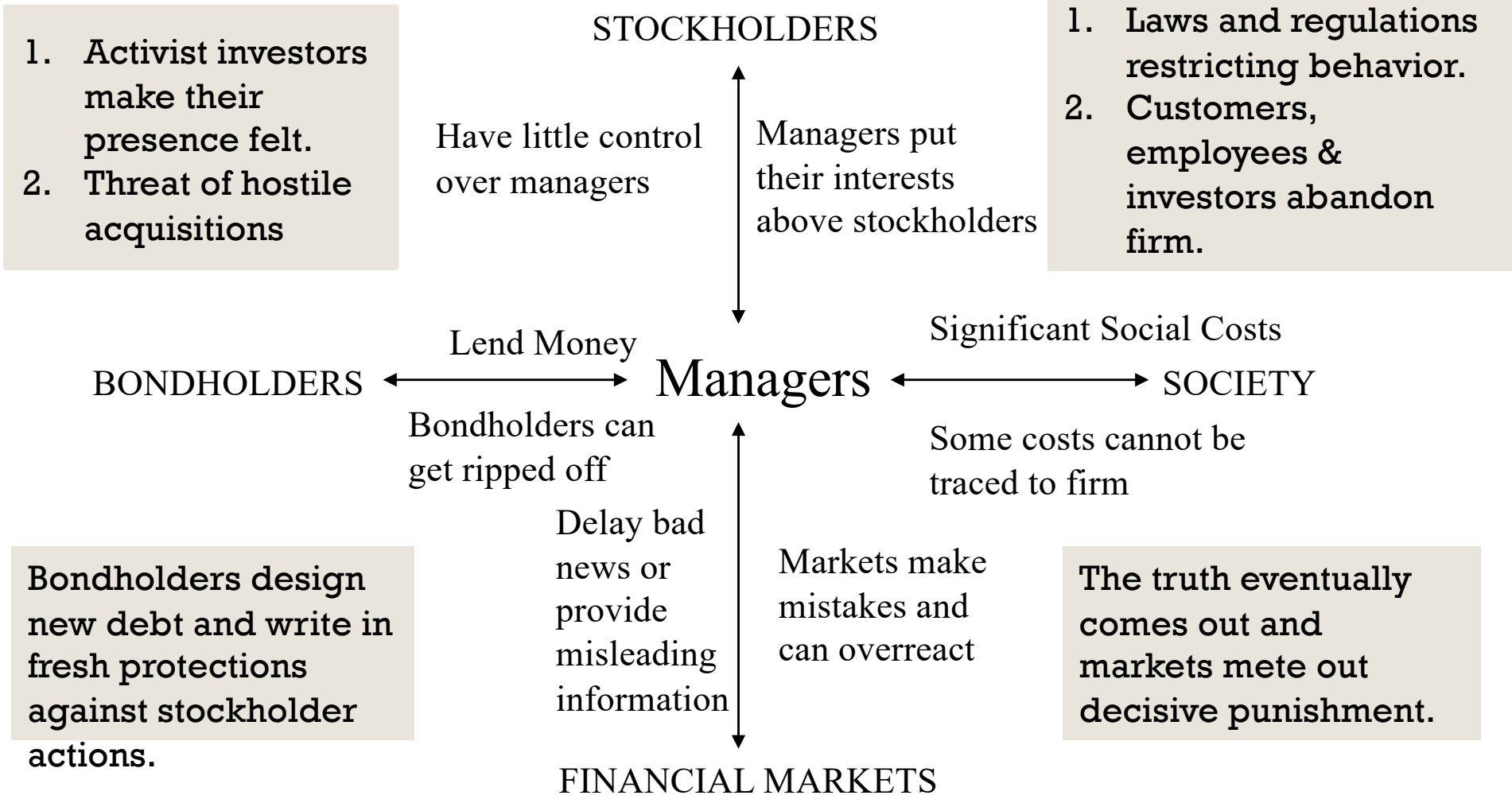
The ESG Gravy Train (or Circle)



III. MAXIMIZE STOCK PRICE, SUBJECT TO ..

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

MARKET DISCIPLINE AS SELF-CORRECTION



1. THE STOCKHOLDER BACKLASH

- **Vocal stockholders, armed with more information and new powers**: At annual meetings, stockholders have taken to expressing their displeasure with incumbent management by voting against their compensation contracts or their board of directors.
- **Shareholders become more receptive to activist investor campaigns**: Activist investors (individuals and institutions) target companies where shareholders are unhappy with the status quo and push for change.
- **Hostile acquisitions**: There is nothing that focuses management minds more than the threat of a hostile acquisition. The typical target firm in a hostile takeover has
  - a return on equity almost 5% lower than its peer group
  - had a stock that has significantly under performed the peer group over the previous 2 years
  - has managers who hold little or no stock in the firm

DISNEY: EISNER'S RISE & FALL FROM GRACE

- In his early years at Disney, Michael Eisner **brought about long-delayed changes in the company** and put it on the path to being an entertainment giant that it is today. His success allowed him to consolidate power and the boards that he created were increasingly captive ones.
- In 1996, Eisner **spearheaded the push to buy ABC and the board rubberstamped his decision**, as they had with other major decisions.
  - In the years following, the **company ran into problems** both on its ABC acquisition and on its other operations and stockholders started to get restive, especially as the stock price halved between 1998 and 2002.
  - In 2003, Roy Disney and Stanley Gold **resigned from the Disney board**, arguing against Eisner's autocratic style.
- In early 2004, **Comcast made a hostile bid for Disney** and later in the year, 43% of Disney shareholders withheld their votes for Eisner's reelection to the board of directors. Following that vote, the board of directors at Disney voted unanimously to elect George Mitchell as the Chair of the board, replacing Eisner, who vowed to stay on as CEO.

EISNER'S CONCESSION: DISNEY'S BOARD IN 2003

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

CHANGES IN CORPORATE GOVERNANCE AT DISNEY

- Required at least two executive sessions of the board, without the CEO or other members of management present, each year.
- Created the position of non-management presiding director, and appointed Senator George Mitchell to lead those executive sessions and assist in setting the work agenda of the board.
- Adopted a new and more rigorous definition of director independence.
- Required that a substantial majority of the board be comprised of directors meeting the new independence standards.
- Provided for a reduction in committee size and the rotation of committee and chairmanship assignments among independent directors.
- Added new provisions for management succession planning and evaluations of both management and board performance
- Provided for enhanced continuing education and training for board members.

EISNER'S EXIT... IGER'S ENTRY AND A NEW AGE DAWNS?

A New CEO



A Better Board?

Board Members	*Occupation*
John E. Pepper, Jr. (Chairman)	Retired Chairman and CEO, Procter & Gamble Co.
Susan E. Arnold	President, Global Business Units, Procter & Gamble Co.
John E. Bryson	Retired Chairman and CEO, Edison International
John S. Chen	Chairman,, CEO & President, Sybase, Inc.
Judith L. Estrin	CEO, JLabs, LLC.
Robert A. Iger	CEO, Disney
Steven P. Jobs	CEO, Apple
Fred Langhammer	Chairman, Global Affairs, The Estee Lauder Companies
Aylwin B. Lewis	President and CEO, Potbelly Sandwich Works
Monica Lozano	Publisher and CEO, La Opinion
Robert W. Matschullat	Retired Vice Chairman and CFO, The Seagram Co.
Orin C. Smith	Retired President and CEO, Starbucks Corporation

And a plan for transition..

In 2011, Iger announced his intent to step down as CEO in 2015 to allow a successor to be groomed.

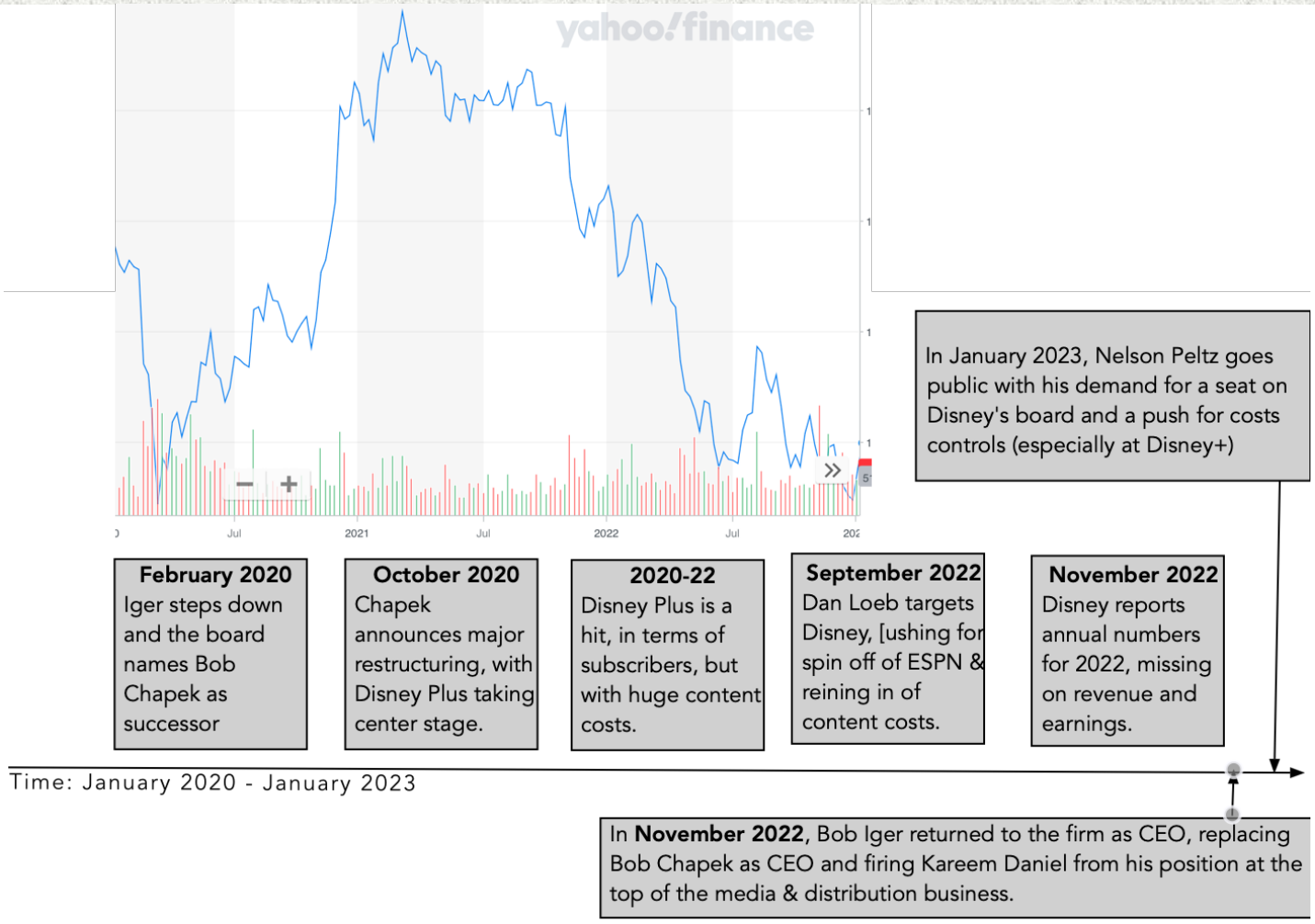
BUT AS A CEO'S TENURE LENGTHENS, DOES CORPORATE GOVERNANCE SUFFER?

- In 2011, the board voted to reinstate Iger as chair of the board in 2011, reversing a decision made to separate the CEO and Chair positions after the Eisner years.
- There were signs of restiveness among Disney's stockholders, especially those interested in corporate governance.
  - Activist investors (CalSTRS) started making noise and Institutional Shareholder Services (ISS), which gauges corporate governance at companies, raised red flags about compensation and board monitoring at Disney.
  - Shareholder votes challenging management became more common.

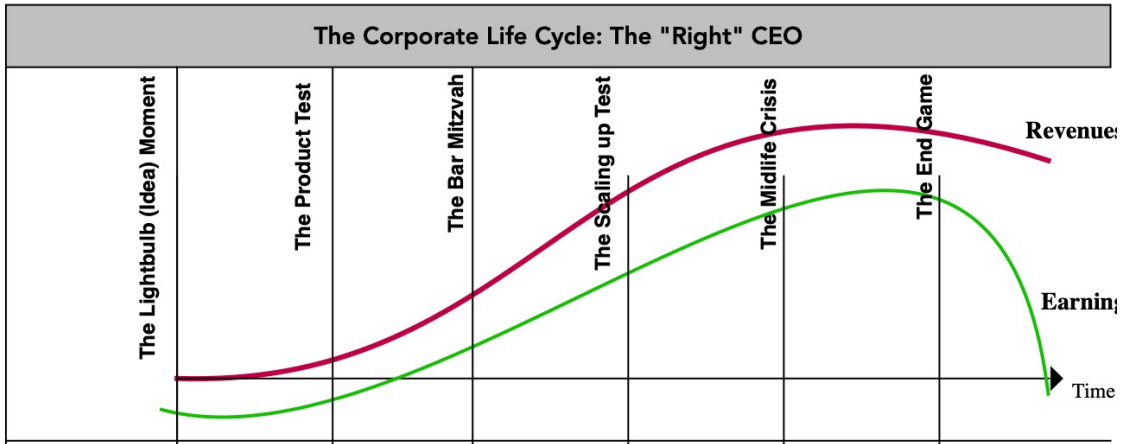
IGER'S NON-EXIT, THE DOMINO EFFECT AND A RESOLUTION?

- In 2015 but Disney's board convinced Iger to stay on as CEO for an extra year, for the "the good of the company".
  - In 2016, Thomas Staggs who was considered heir apparent to Iger left Disney. Others who were considered potential CEOs also left.
  - In 2017, Disney acquired Fox and announced that Iger's term would be extended to 2019 (and perhaps beyond) because his stewardship was essential for the merger to work.
- In February 2020, Iger stepped down as CEO (but stayed on as Exec Chair until Dec 2021), and Bob Chapek, head of Disney Theme Parks, took his place. Disney's stock price dropped about 8% in the immediate aftermath.

ACTIVISTS COME FOR DISNEY...

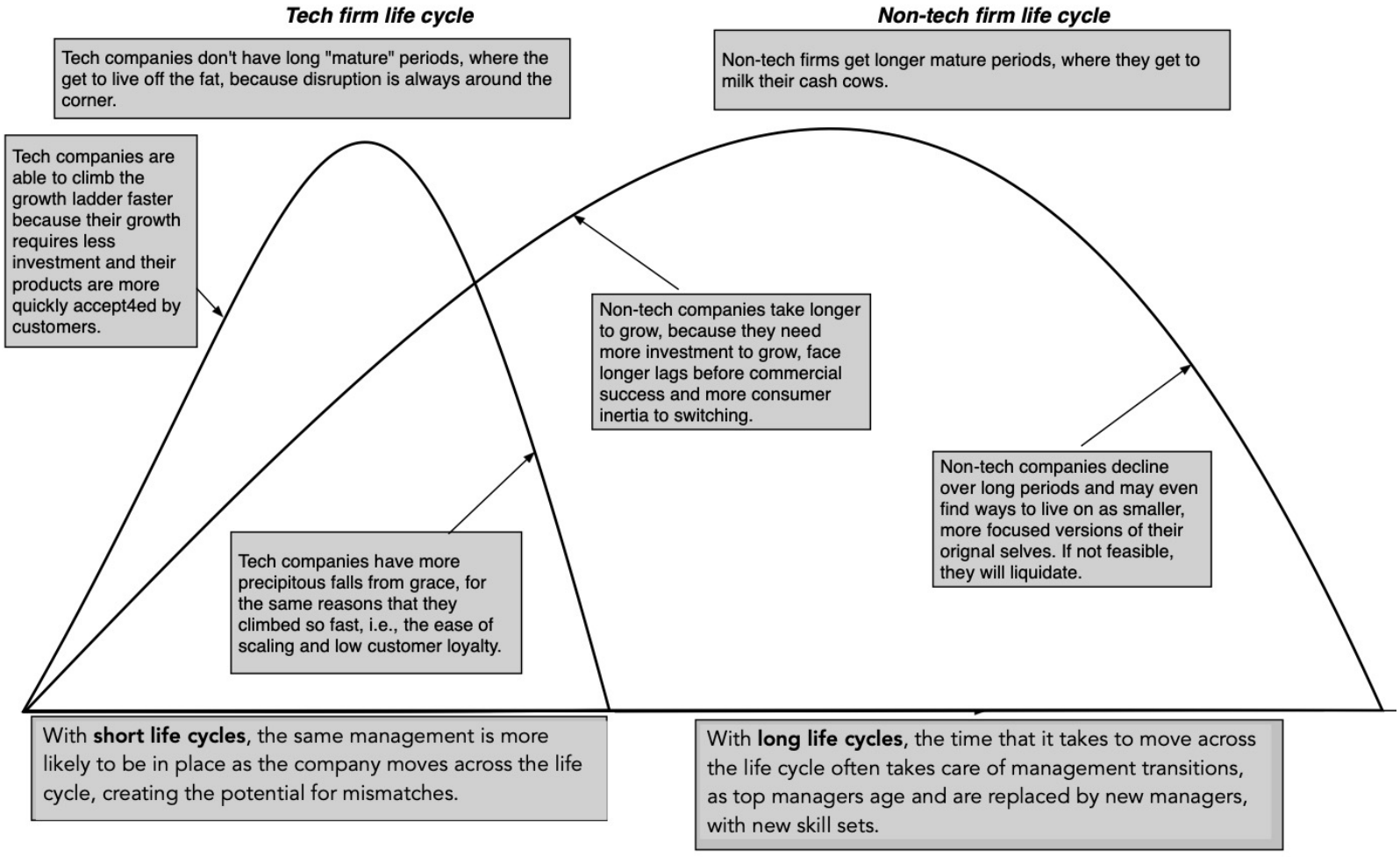


A LIFE CYCLE VIEW OF CEOS

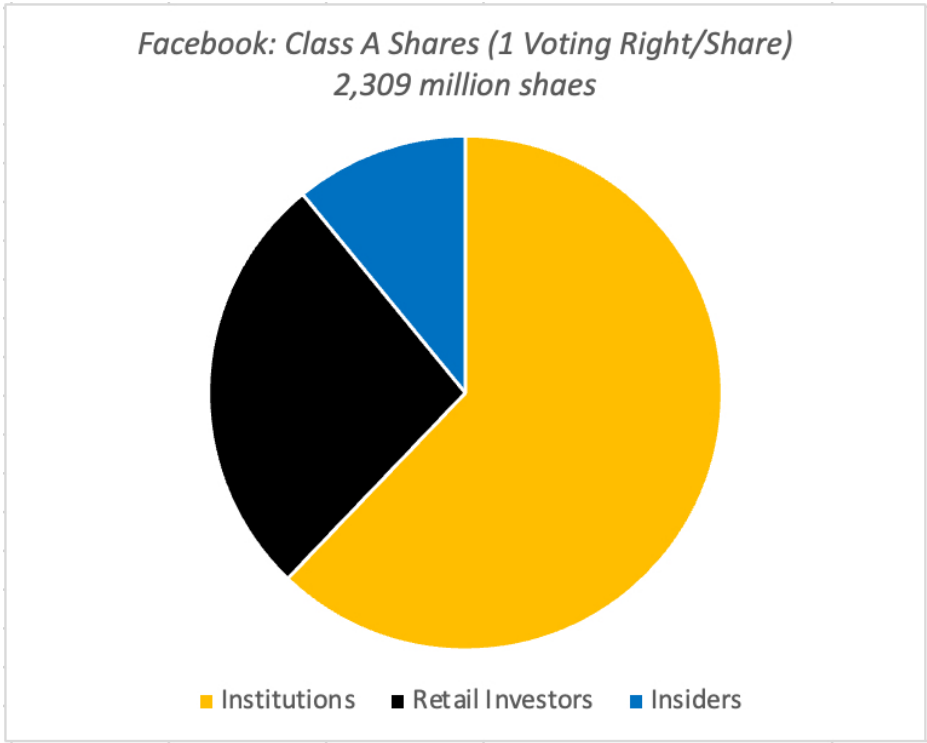


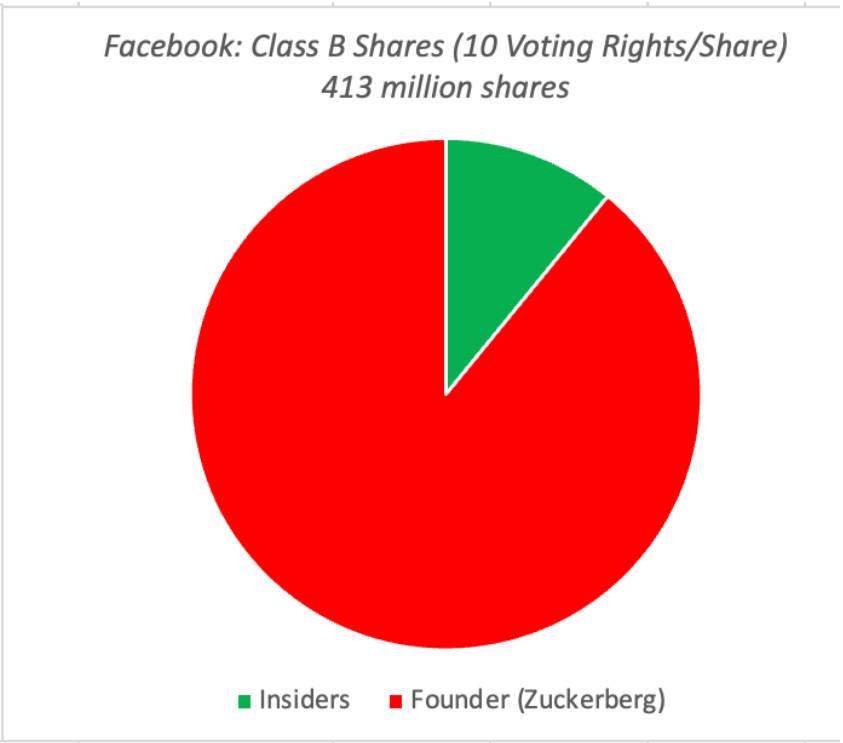
Lifecycle stage	Start-up	Young Growth	High Growth	Mature Growth	Mature Stable	Decline
Management's Importance	Critical, in selling vision & creating business model		Decreases as firm matures, and more so in macro businesses			Significant, since denial or desperation can be costly.
Management role in narrative/ numbers	Visionary/Story Teller	Stay consistent with words & actions	Deliver numbers to back up story	Keep narrative in sync with numbers	Adjust your narrative to reflect where you are in the life cycle.	Act your age (in terms of narrative & choices)
Management key function	Sell a vision (story) to investors and employees	Build a business model to deliver on vision	Scale up the business model	Extend the business model into new maarkets	Defend the business model against competitors	Scale down the business model
The Right CEO	**Steve, the Visionary**	**Paula, the Pragmatist**	**Bob, the Builder**	**Oscar, the Opportunist**	**Donna, the Defender**	**Larry, the Liquidator**

THE COMPRESSED TECH LIFE CYCLE



CORPORATE GOVERNANCE AT TECH FIRMS: THE FACEBOOK EXAMPLE





	% of shares	% of voting rights
Institutions	52.72%	22.29%
Retail Investors	22.83%	9.65%
Insiders (no Zuckerberg)	10.93%	10.92%
Zuckerberg	13.52%	57.14%

2. THE BONDHOLDERS' DEFENSE AGAINST STOCKHOLDER EXCESSES

- More restrictive covenants on investment, financing and dividend policy have been incorporated into both private lending agreements and into bond issues, to prevent future "Nabiscos".
- New types of bonds have been created to explicitly protect bondholders against sudden increases in leverage or other actions that increase lender risk substantially. Two examples of such bonds
  - Puttable Bonds, where the bondholder can put the bond back to the firm and get face value, if the firm takes actions that hurt bondholders
  - Ratings Sensitive Notes, where the interest rate on the notes adjusts to that appropriate for the rating of the firm
- More hybrid bonds (with an equity component, usually in the form of a conversion option or warrant) have been used. This allows bondholders to become equity investors, if they feel it is in their best interests to do so.

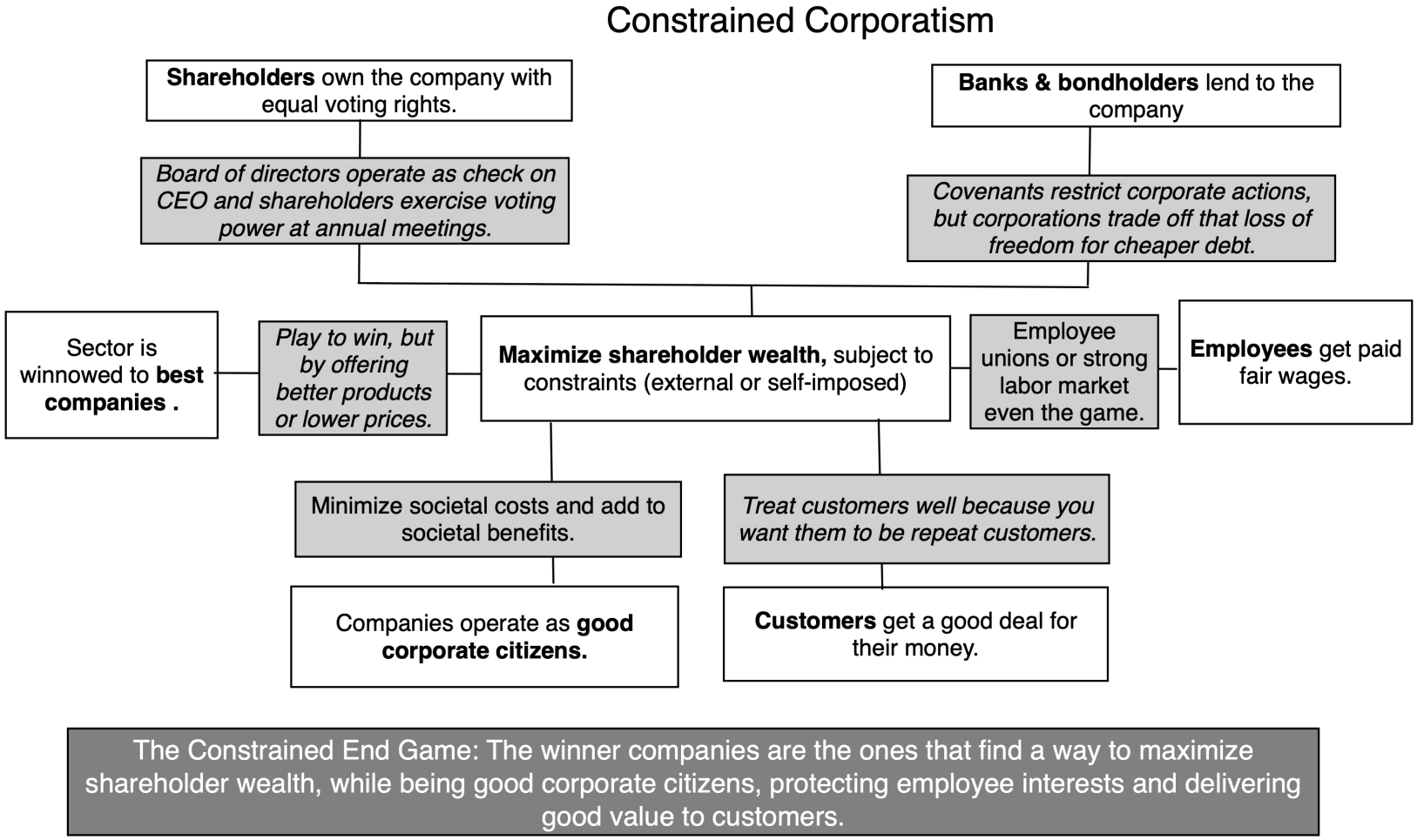
3. THE FINANCIAL MARKET RESPONSE

- Companies can mislead investors for long periods, leading stock prices away from value and skewing capital allocation across firms. (Firms that mislead have access to more capital than they should…)
  - Analysts, for the most part, seem to be ineffective at uncovering these "problems", sometimes because of tunnel vision and sometimes because of biases.
  - As investor access to information improves, it is becoming much more difficult for firms to control when and how information gets out to markets.
  - If there are ways of trading on over valuation, the payoff to uncovering negative information about companies rises, and there will be an incentive on the part of investors to uncover the truth.
- No matter what, the truth eventually does come out, and when it does:
  - The punishment is not only quick, but it is savage. Stock prices drop, as markets reset.
  - The management of the company loses credibility making it difficult for the company to find its way back to health.

4. THE SOCIETAL RESPONSE

- If firms consistently flout societal norms and create large social costs, the governmental response (especially in a democracy) is for laws and regulations to be passed against such behavior.
- Even if governments and regulators do not act, a company that deliberately flouts societal norms and acquires a reputation as a bad company can pay a price:
  - For firms catering to a more socially conscious clientele, the failure to meet societal norms (even if it is legal) can lead to loss of customers and revenues.
  - These firms may have trouble holding on to employees
  - Investors may choose not to invest in stocks of firms that they view as socially irresponsible and lenders may be reluctant to lend money to the firm.
  - If this seems like a back-handed argument for ESG, it is, but it is a very restrictive one where the advice to companies it to not be bad (rather than to be good).

CONSTRAINED CORPORATISM



The Constrained End Game: The winner companies are the ones that find a way to maximize shareholder wealth, while being good corporate citizens, protecting employee interests and delivering good value to customers.

THE MODIFIED OBJECTIVE FUNCTION

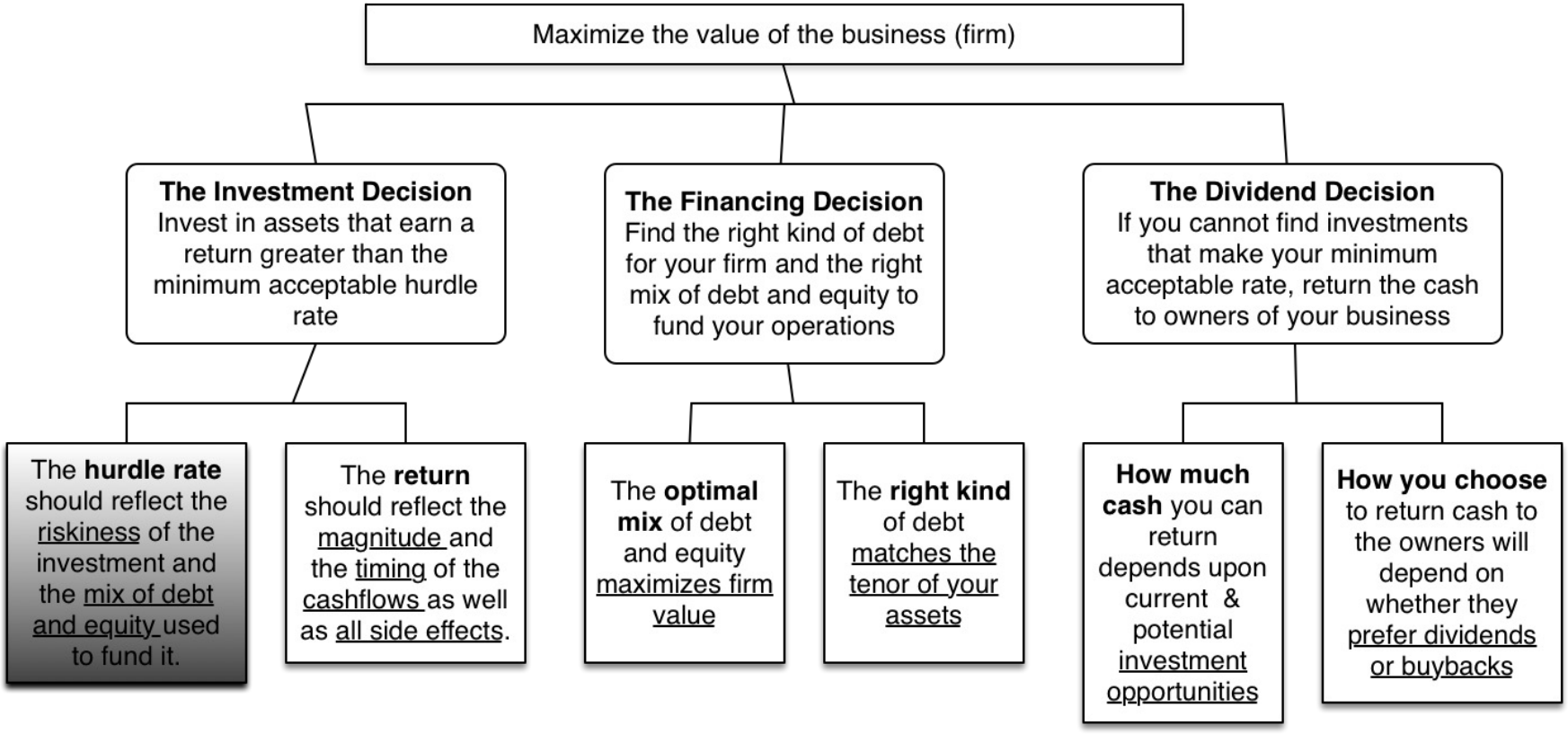
- For publicly traded firms in reasonably efficient markets, where bondholders (lenders) are protected:
  - Maximize Stock Price: This will also maximize firm value
- For publicly traded firms in inefficient markets, where bondholders are protected:
  - Maximize stockholder wealth: This will also maximize firm value, but might not maximize the stock price
- For publicly traded firms in inefficient markets, where bondholders are not fully protected
  - Maximize firm value, though stockholder wealth and stock prices may not be maximized at the same point.
- For private firms, maximize stockholder wealth (if lenders are protected) or firm value (if they are not)

THE INVESTMENT PRINCIPLE: RISK AND RETURN MODELS

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

Aswath Damodaran

FIRST PRINCIPLES



THE NOTION OF A BENCHMARK

- Since financial resources are finite, **there is a hurdle that projects have to cross before being deemed acceptable.** This hurdle should be higher for riskier projects than for safer projects.
- A simple representation of the hurdle rate is as follows:
  - **Hurdle rate = Riskless Rate + Risk Premium**
- The two basic questions that every risk and return model in finance tries to answer are:
  - How do you **measure risk**?
  - How do you **translate this risk measure into a risk premium**?

WHAT IS RISK?

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

危機

  - The first symbol is the **symbol for "danger"**.
  - 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 how to avoid risk but how best to incorporate it into their decision making.

A GOOD RISK AND RETURN MODEL SHOULD...

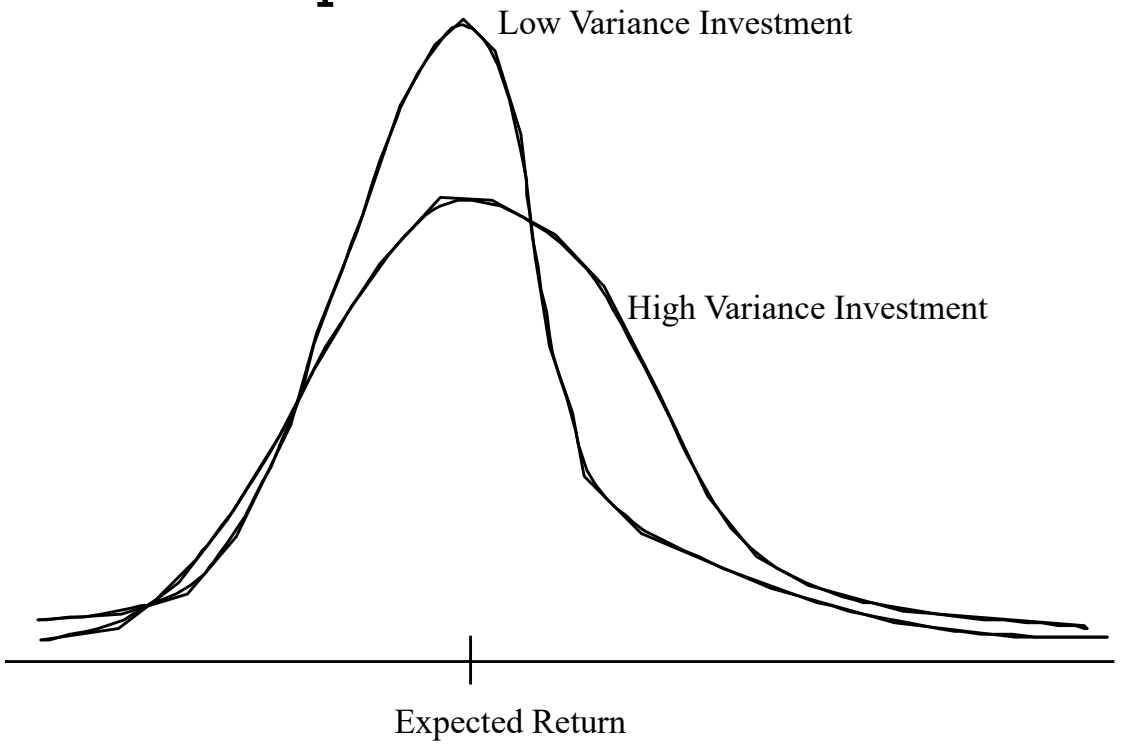
- It should come up with a **measure of risk that applies to all assets** and not be asset-specific.
- It should clearly delineate **what types of risk are rewarded and what are not**, and provide a rationale for the delineation.
- It should come up with **standardized risk measures**, i.e., an investor presented with a risk measure for an individual asset should be able to draw conclusions about whether the asset is above-average or below-average risk.
- It should **translate the measure of risk into a rate of return** that the investor should demand as compensation for bearing the risk.
- It **should work well not only at explaining past returns**, but also in predicting future expected returns.

THE CAPITAL ASSET PRICING MODEL

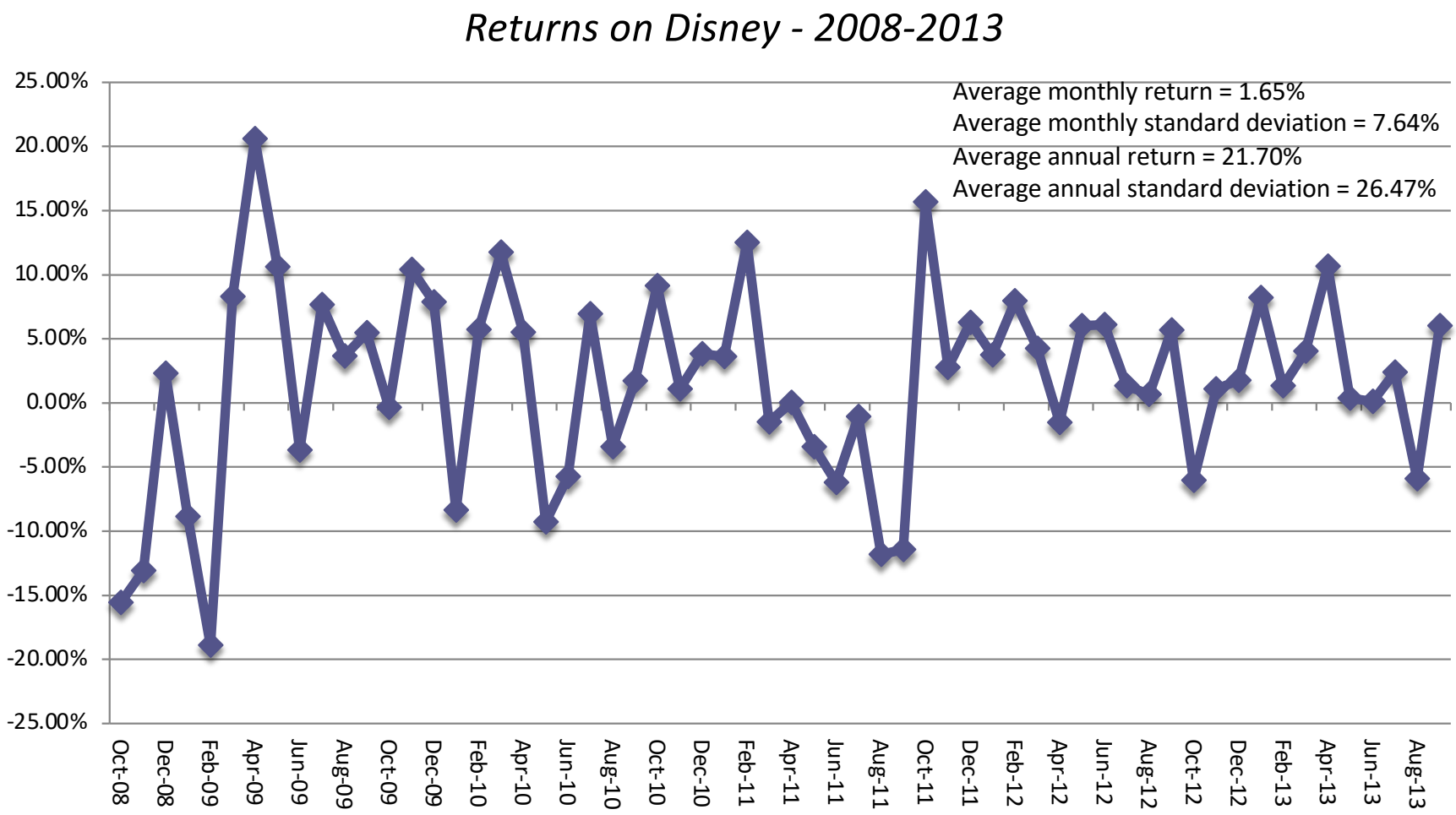
- Uses **variance of actual returns** around an expected return as a measure of risk.
- Specifies that a **portion of variance can be diversified away**, and that is only the non-diversifiable portion that is rewarded.
- Measures the **non-diversifiable risk with beta**, which is standardized around one.
- Translates **beta into expected return -**
  - Expected Return = Riskfree rate + Beta * Risk Premium
- Works **as well as the next best alternative** in most cases.

1. THE MEAN-VARIANCE FRAMEWORK

- The variance on any investment measures the disparity between actual and expected returns.



HOW RISKY IS DISNEY? A LOOK AT THE PAST...

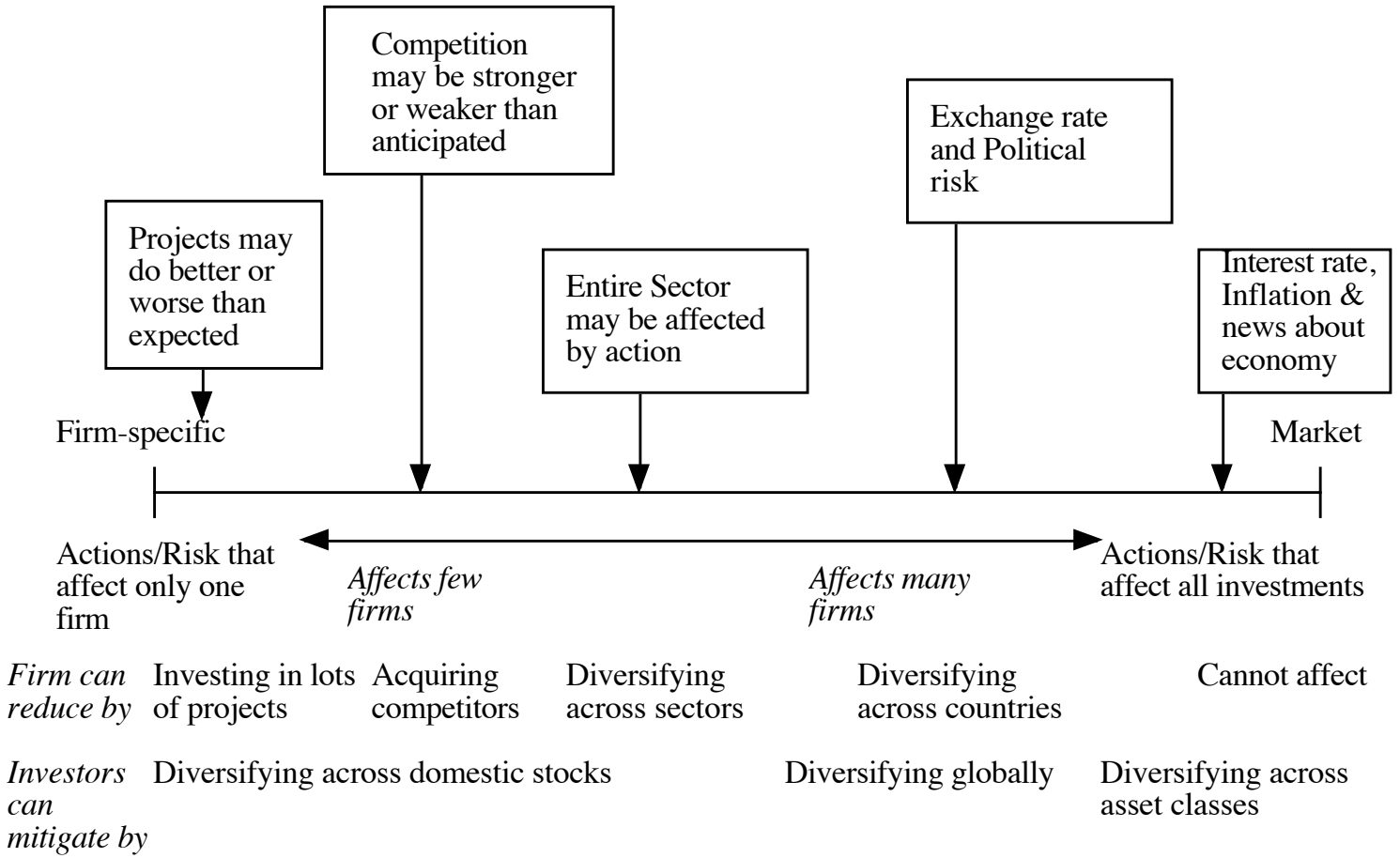


DO YOU LIVE IN A MEAN-VARIANCE WORLD?

- Assume that you had to pick between two investments. They have the same expected return of 15% and the same standard deviation of 25%; however, investment A offers a very small possibility that you could quadruple your money, while investment B's highest possible payoff is a 60% return. Would you
  - be indifferent between the two investments, since they have the same expected return and standard deviation?
  - prefer investment A, because of the possibility of a high payoff?
  - prefer investment B, because it is safer?
- Would your answer change if you were not told that there is a small possibility that you could lose 100% of your money on investment A but that your worst-case scenario with investment B is -50%?

2. THE IMPORTANCE OF DIVERSIFICATION: RISK TYPES

Figure 3.5: A Break Down of Risk



WHY DIVERSIFICATION REDUCES/ELIMINATES FIRM SPECIFIC RISK

- Firm-specific risk can be reduced, if not eliminated, by increasing the number of investments in your portfolio (i.e., by being diversified). Market-wide risk cannot. This can be justified on either economic or statistical grounds.
- On economic grounds, diversifying and holding a larger portfolio eliminates firm-specific risk for two reasons-
  - Each investment is a much smaller percentage of the portfolio, muting the effect (positive or negative) on the overall portfolio.
  - Firm-specific actions can be either positive or negative. In a large portfolio, it is argued, these effects will average out to zero. (For every firm, where something bad happens, there will be some other firm, where something good happens.)

THE ROLE OF THE MARGINAL INVESTOR

- The marginal investor in a firm is the investor who is most likely to be the buyer or seller on the next trade and to influence the stock price.
  - Generally speaking, the marginal investor in a stock has to own a lot of stock and also trade that stock on a regular basis.
  - Since trading is required, the largest investor may not be the marginal investor, especially if he or she is a founder/manager of the firm (Larry Ellison at Oracle, Mark Zuckerberg at Facebook…)
- In risk and return models in finance, we start with the marginal investor is well diversified.

IDENTIFYING THE MARGINAL INVESTOR IN YOUR FIRM...

Percent of Stock held by Institutions	*Percent of Stock held by Insiders*	*Marginal Investor*
High	Low	Institutional Investor
High	High	Institutional Investor, with insider influence
Low	High (held by founder/manager of firm)	Tough to tell; Could be insiders but only if they trade. If not, it could be individual investors.
Low	High (held by wealthy individual investor)	Wealthy individual investor, fairly diversified
Low	Low	Small individual investor with restricted diversification

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 | 23) Saved Searches | 24) Refine Search

Text Search | Holder Group: All Holders | 20) Export

	Holder Name	Portfolio Name	Source	Opt	Amt Held	% Out	Latest Chg	File Dt
			All Sources	All				
1.	LAURENE POWELL JOBS TRU	n/a	PROXY		130,844,544	7.32	0	01/07/13
2.	BLACKROCK	n/a	ULT-AGG		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 C	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%

EXTENDING THE ASSESSMENT OF THE INVESTOR BASE

- In all five of the publicly traded companies that we are looking at, institutions are big holders of the company's stock.

	Disney	*Deutsche Bank*	*Vale (preferred)*	*Tata Motors*	*Baidu (Class A)*
Institutions	70.2%	40.9%	71.2%	44%	70%
Individuals	21.3%	58.9%	27.8%	25%	20%
Insiders	7.5%	0.2%	1.0%	31%*	10%

Company	*Largest holder*	*Number of institutional investors in top ten holdings*
Disney	Laurene Jobs (7.3%)	8
Deutsche Bank	Blackrock (4.69%)	10
Vale Preferred	Aberdeen (7.40%)	8
Tata Motors	Tata Sons (26.07%)	7
Baidu (Class A)	Capital Group (12.46%)	10

3. THE LIMITING CASE: THE MARKET PORTFOLIO

- **The big assumptions & the follow up**: Assuming diversification costs nothing (in terms of transactions costs), and that all assets can be traded, the **limit of diversification is to hold a portfolio of every single asset in the economy (in proportion to market value).** This portfolio is called the market portfolio.
- The consequence: Individual investors will adjust for risk, by adjusting their allocations to this market portfolio and a riskless asset (such as a T-Bill):

Preferred risk level	*Allocation decision*
No risk	100% in T-Bills
Some risk	50% in T-Bills; 50% in Market Portfolio;
A little more risk	25% in T-Bills; 75% in Market Portfolio
Even more risk	100% in Market Portfolio
A risk hog..	Borrow money; Invest in market portfolio

4. THE RISK & EXPECTED RETURN OF AN INDIVIDUAL ASSET

- **The essence**: The risk of any asset is the risk that it adds to the market portfolio Statistically, this risk can be measured by how much an asset moves with the market (called the covariance)
- **The measure**: Beta is a standardized measure of this covariance, obtained by dividing the covariance of any asset with the market by the variance of the market. It is a measure of the non-diversifiable risk for any asset can be measured by the covariance of its returns with returns on a market index, which is defined to be the asset's beta.
- **The result**: The required return on an investment will be a linear function of its beta:
  - Expected Return = Riskfree Rate+ Beta * (Expected Return on the Market Portfolio - Riskfree Rate)

LIMITATIONS OF THE CAPM

1. The model **makes unrealistic assumptions**

2. The **parameters of the model cannot be estimated precisely**

   The market index used can be wrong.

   The 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

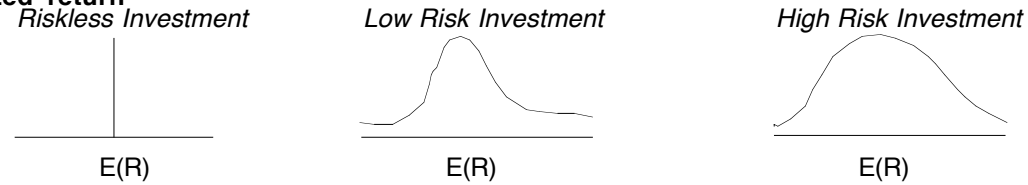
     The relationship between betas and returns is weak

     - Other variables (size, price/book value) seem to explain differences in returns better.

ALTERNATIVES TO THE CAPM

Step 1: Defining Risk

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



Step 2: Differentiating between Rewarded and Unrewarded Risk

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

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

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

Step 3: Measuring Market Risk

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

WHY THE CAPM PERSISTS...

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

APPLICATION TEST: WHO IS THE MARGINAL INVESTOR IN YOUR FIRM?

- You can get information on insider and institutional holdings in your firm from:
  - http://finance.yahoo.com/
  - Enter your company's symbol and choose profile.
- Looking at the breakdown of stockholders in your firm, consider whether the marginal investor is
  - An institutional investor
  - An individual investor
  - An insider
- Follow up by evaluating whether the marginal investor is likely to be diversified.
  - If yes, you are on safer ground using the risk and return models that assume that only non-diversifiable risk is rewarded.
  - If no, you will have to adapt your risk measure to bring in some or all o fthe company-specific risk that you were ignoring.

FROM RISK MODELS TO HURDLE RATES: ESTIMATION CHALLENGES

"The price of purity is purists…"

Aswath Damodaran

INPUTS REQUIRED TO USE THE CAPM -

- The capital asset pricing model yields the following expected return:
  - Expected Return = Riskfree Rate+ Beta * (Expected Return on the Market Portfolio - Riskfree Rate)
- To use the model, we need three inputs:
  - The **current risk-free rate**
  - The **expected equity risk premium**, the premium expected for investing in risky assets, i.e. the market portfolio, over the riskless asset.
  - The **beta of the asset** being analyzed.

THE RISKFREE RATE AND TIME HORIZON

- On a riskfree asset, **the actual return is always 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 **can 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 ra**tes, which implies that it is a zero-coupon security with the same maturity as the cash flow being analyzed.

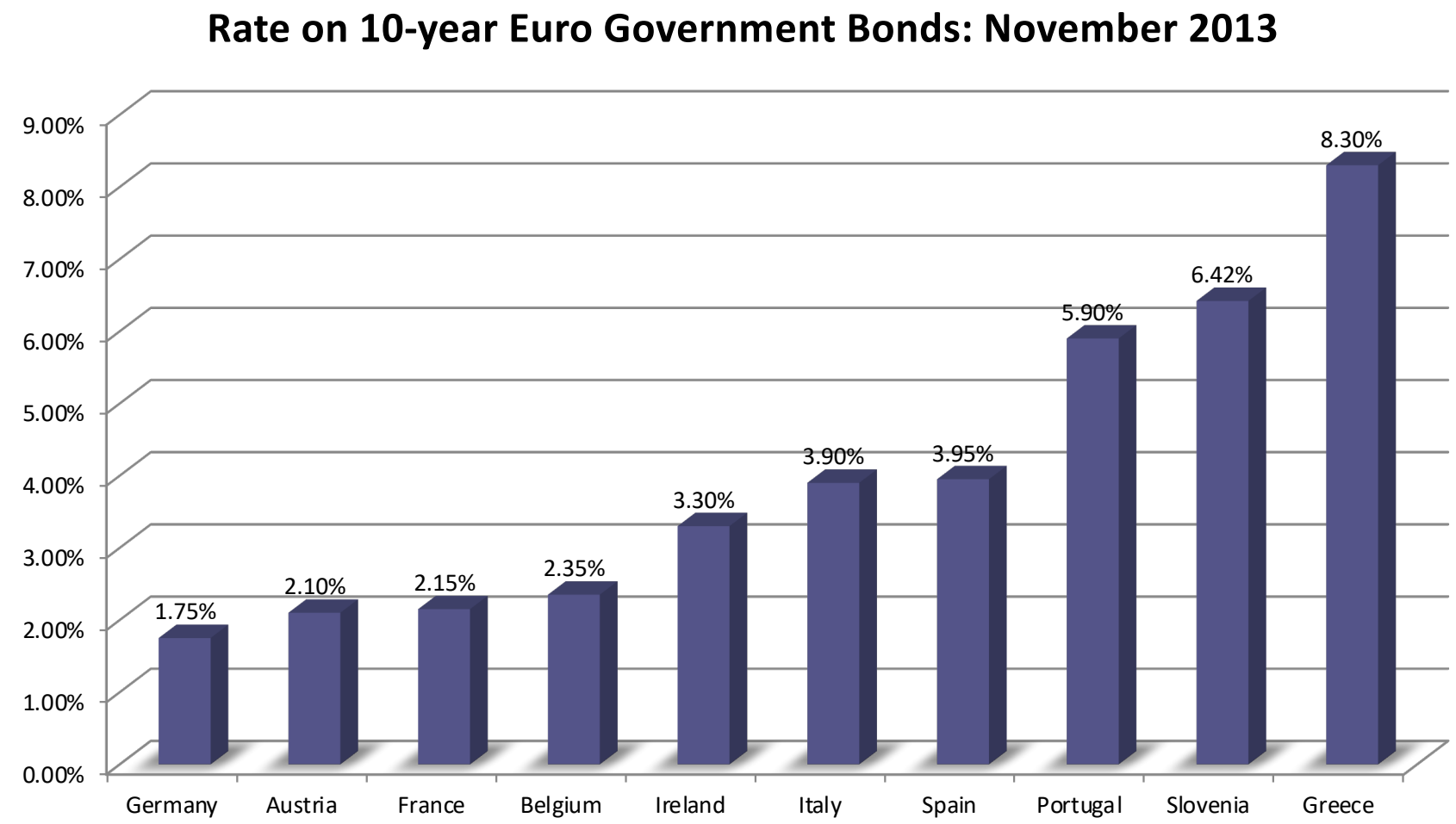
RISKFREE RATE IN PRACTICE

- **Definition**: The riskfree rate is the **rate on a zero coupon default-free bond** matching the time horizon of the cash flow being analyzed.
- **Implication**: Theoretically, this translates into **using different riskfree rates for each cash flow** - the 1 year zero coupon rate for the cash flow in year 1, the 2-year zero coupon rate for the cash flow in year 2 ...
- **A Practical Solution**: Practically speaking, if there is substantial uncertainty about expected cash flows, the present value effect of using time varying riskfree rates is small enough that it may not be worth it.
- **In corporate finance, almost everything we do is long term. So, using a long-term default free rate as the riskfree rate makes sense.**

THE BOTTOM LINE ON RISKFREE RATES

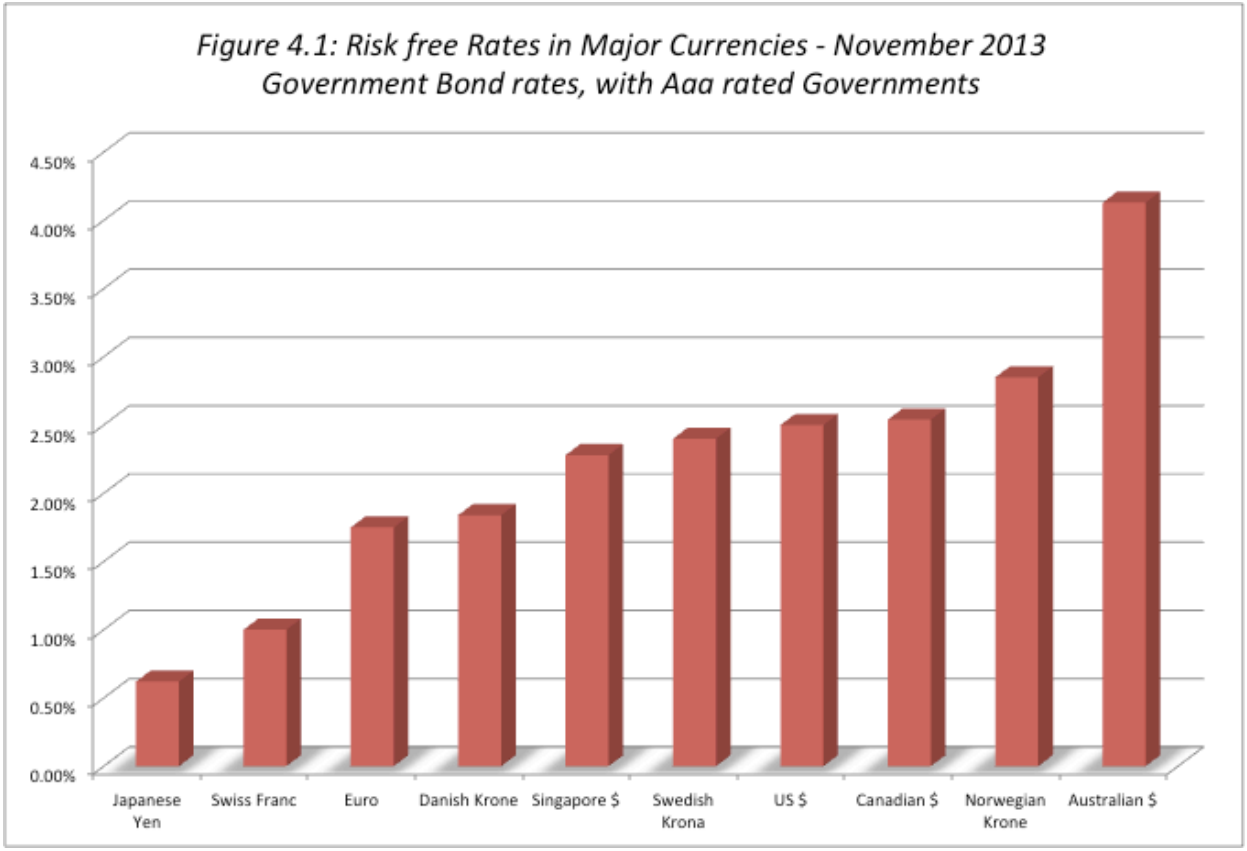
- **Currency Matching**: The riskfree rate that you use in an analysis should be in the same currency that your cashflows are estimated in.
  - In other words, if your cashflows are in U.S. dollars, your riskfree rate has to be in U.S. dollars as well.
  - If your cash flows are in Euros, your riskfree rate should be a Euro riskfree rate.
- **Just use the government bond rate?** The conventional practice of estimating riskfree rates is to use the government bond rate, with the government being the one that is in control of issuing that currency.
- **If the government is default-free**, using a long term government rate (even on a coupon bond) as the risk free rate on all of the cash flows in a long term analysis will yield a close approximation of the true value. With US dollars in November 2013, for instance, the ten-year treasury bond rate of 2.75% was used as the riskfree rate.

WHAT IS THE EURO RISKFREE RATE? AN EXERCISE IN NOVEMBER 2013



WHEN THE GOVERNMENT IS DEFAULT FREE: RISK FREE RATES – IN NOVEMBER 2013

Figure 4.1: Risk free Rates in Major Currencies - November 2013
Government Bond rates, with Aaa rated Governments



WHAT IF THERE IS NO DEFAULT-FREE ENTITY? RISK FREE RATES IN NOVEMBER 2013

- **Adjust the local currency government borrowing rate for default risk** to get a riskless local currency rate.
  - In November 2013, the Indian government rupee bond rate was 8.82%. the local currency rating from Moody's was Baa3 and the default spread for a Baa3 rated country bond was 2.25%.

    Riskfree rate in Rupees = 8.82% - 2.25% = 6.57%
  - In November 2013, the Chinese Renmimbi government bond rate was 4.30% and the local currency rating was Aa3, with a default spread of 0.8%.

    Riskfree rate in Chinese Renmimbi = 4.30% - 0.80% = 3.50%
- **Do the analysis in an alternate currency**, where getting the riskfree rate is easier. With Vale in 2013, we could choose to do the analysis in US dollars (rather than estimate a riskfree rate in R$). 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.

THREE PATHS TO ESTIMATING SOVEREIGN DEFAULT SPREADS

- **Sovereign dollar or euro denominated bonds**: The difference between the interest rate on a sovereign US $ bond, issued by the country, and the US treasury bond rate can be used as the default spread. For example, in November 2013, the 10-year Brazil US $ bond, denominated in US dollars had a yield of 4.25% and the US 10-year T.Bond rate traded at 2.75%.

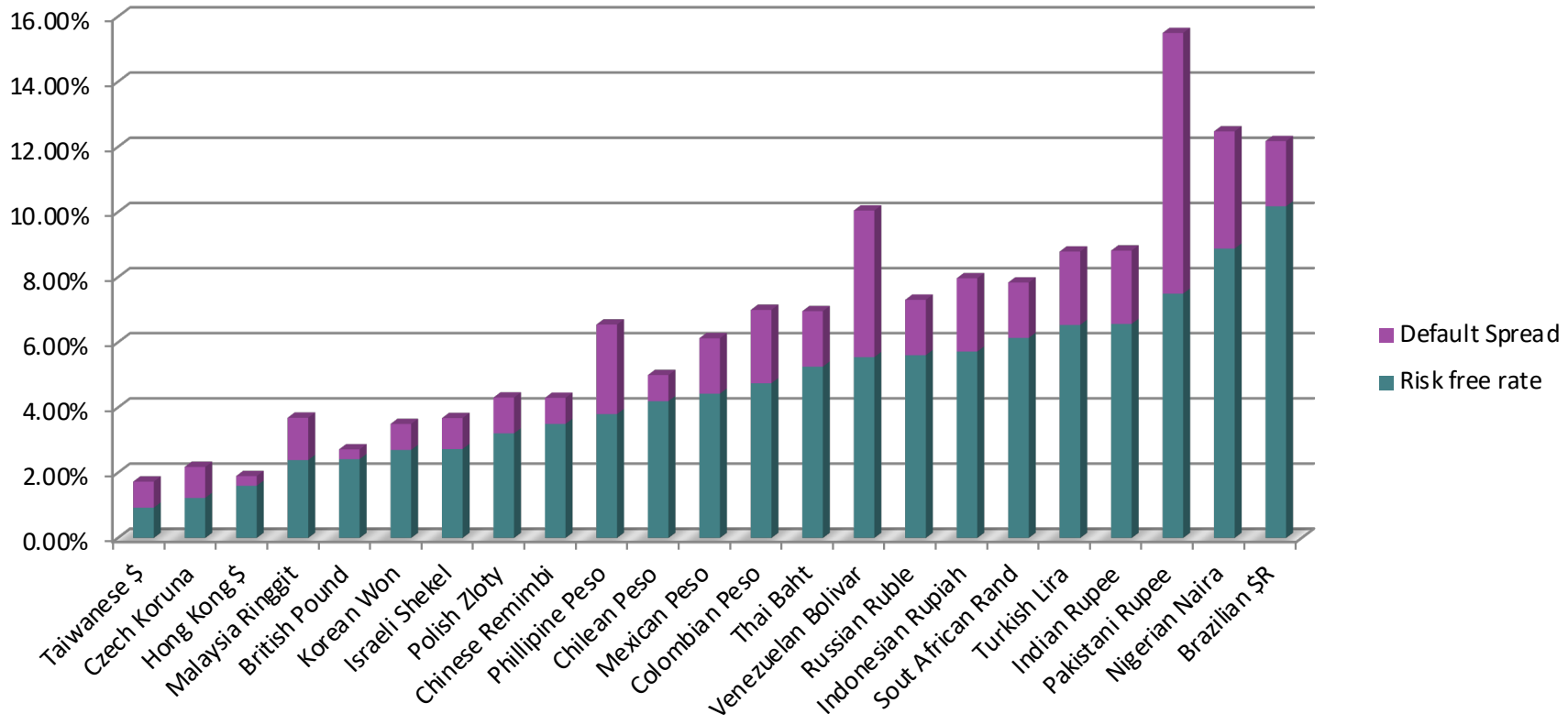
  Default spread = 4.25% - 2.75% = 1.50%

- **Sovereign CDS spreads**: Obtain the default spreads for sovereigns in the CDS market. The CDS spread for Brazil in November 2013 was 2.50%.

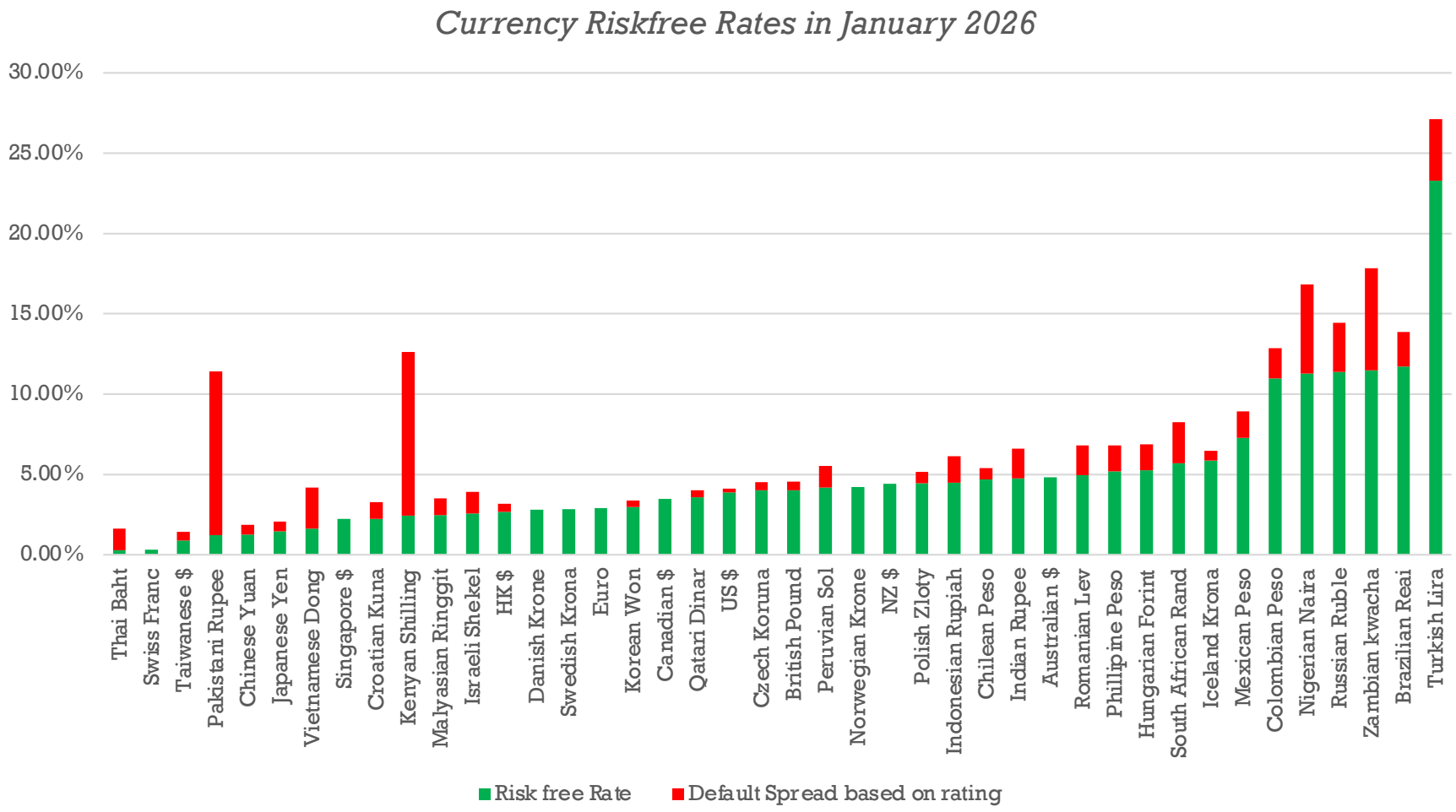
- **Ratings-based spread**: If you know the sovereign rating for a country, you can estimate the default spread based on the rating. In November 2013, Brazil's rating was Baa2, yielding a default spread of 2%.

RISK FREE RATES IN CURRENCIES: SOVEREIGNS WITH DEFAULT RISK IN NOVEMBER 2013

Figure 4.2: Risk free rates in Currencies where Governments not Aaa rated



RISK FREE RATES IN JANUARY 2026



Aswath Damodaran

MEASUREMENT OF THE EQUITY RISK PREMIUM

- The equity risk premium is **the premium that investors demand for investing in an average risk equity**, relative to the riskfree rate. In short, it is the price of risk in equity markets, rising with fear.
- 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**
- If so, it also follows that equity risk **premiums should change over time**, as economic circumstances change and investor composition also changes.

WHAT IS YOUR RISK PREMIUM?

- Assume that stocks are the only risky assets and that you are offered two investment options:
  - a **riskless investment** (say a Government Security), on which you can make 4%
  - **An index fund of all stocks**, on which the returns are uncertain
- How much of an expected return would you demand to shift your money from the riskless asset to the mutual fund?
  a. Less than 4%
  b. Between 4% - 6%
  c. Between 6% - 8%
  d. Between 8% -10%
  e. Between 10%- 12%
  f. More than 12%

RISK AVERSION AND RISK PREMIUMS

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

RISK PREMIUMS DO CHANGE..

- Go back to the previous question. Assume now that you are making the same choice but that you are making it in the aftermath of a stock market crash (it has dropped 25% in the last month). Would you change your answer?
  a. I would demand a larger premium
  b. I would demand a smaller premium
  c. I would demand the same premium
- If your equity risk premium rises, what should happen to stock prices, all else held constant?

ESTIMATING RISK PREMIUMS IN PRACTICE

- **Survey Premiums**: Survey investors on their desired risk premiums and use the average premium from these surveys.
- **Historical Premiums**: Assume that the actual premium delivered over long time periods is equal to the expected premium - i.e., use historical data.
- **Implied Premiums**: Estimate a forward-looking premium, based upon today's asset prices.

1. THE SURVEY APPROACH

- Surveying all investors in a marketplace is impractical.
- However, you can survey a few individuals and use these results. In practice, this translates into surveys of the following:

Group Surveyed	*Survey done by*	*Estimated ERP*	*Notes*
Individual Investors	Securities Industries Association	8.3% (2004)	One year premium
Institutional Investors	Merrill Lynch	4.8% (2013)	Monrthly updates
CFOs	Campbell Harvey & Graham	4.48% (2012)	5-8% response rate
Analysts	Pablo Fernandez	5.0% (2011)	Lowest standard deviation
Academics	Pablo Fernandez	5.7% (2011)	Higher for emerging markets

- The limitations of this approach are:
  - There are **no constraints on reasonability** (the survey could produce negative risk premiums or risk premiums of 50%)
  - The survey results are **more reflective of the past than the future**.
  - They **tend to be short term**; even the longest surveys do not go beyond one year.

2. THE HISTORICAL PREMIUM APPROACH

- This is the default approach used by most to arrive at the premium to use in the model
- In most cases, this approach does the following
  - Defines **a time perio**d for the estimation (1928-Present, last 50 years…)
  - Calculates **average returns on a stock in**dex during the period
  - Calculates **average returns on a riskless security** over the period
  - Calculates the difference between the two averages and uses it as a premium looking forward.
- The limitations of this approach are:
  - it assumes that the risk aversion of investors **has not changed in a systematic way across time.** (The risk aversion may change from year to year, but it reverts back to historical averages)
  - it assumes that **the riskiness of the "risky" portfolio (stock index) has not changed** in a systematic way across time.

HISTORICAL ERP: A HISTORICAL SNAPSHOT

	Arithmetic Average		*Geometric Average*	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2025	8.44%	7.03%	6.65%	5.48%
Std Error	*2.00%*	*2.12%*		
1976-2025	8.80%	6.56%	7.61%	5.79%
Std Error	*2.30%*	*2.67%*		
2016-2025	13.50%	14.52%	12.44%	13.79%
Std Error	*5.04%*	*3.65%*		

Historical premium for the US

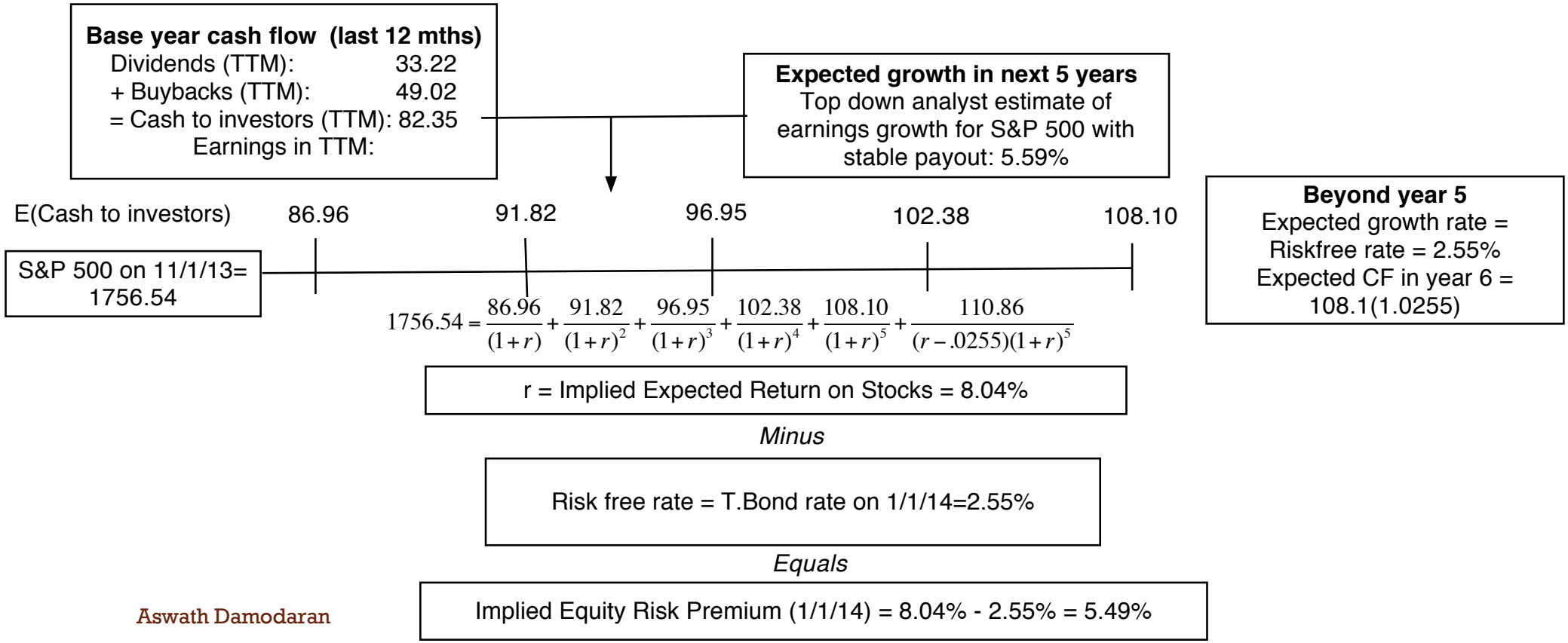
- If you are going to use a historical risk premium, make it
  - Long term (because of the standard error)
  - Consistent with your choice of risk free rate
  - A "compounded" average
- No matter which estimate you use, recognize that it is backward looking, is noisy and may reflect selection bias.

3. A FORWARD-LOOKING ERP

- If you know **the price paid for an asset and have estimates of the expected cash flows on the a**sset, you can estimate the **IRR** of these cash flows. If you paid the price, this is your expected return.
  - In the **bond market**, that is exactly what we do when we compute the yield to maturity on a bond.
  - If you assume that **stocks are correctly priced in the aggregate and you can estimate the expected cashflows from buying stocks, you can estimate the expected rate of return on stocks** by finding that discount rate that makes the present value equal to the price paid.
- Subtracting out the riskfree rate should yield **an implied equity risk premium**. This implied equity premium is a forward-looking number and can be updated as often as you want.

IMPLIED ERP IN NOVEMBER 2013: 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.



THE BOTTOM LINE ON EQUITY RISK PREMIUMS IN NOVEMBER 2013

- **Mature Markets**: In November 2013, the number that we chose to use as the equity risk premium for all mature markets was 5.5%. This was set equal to the implied premium at that point in time and it was much higher than the historical risk premium of 4.20% prevailing then.

	Arithmetic Average		Geometric Average	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2012	7.65%	5.88%	5.74%	4.20%
	2.20%	2.33%		
1962-2012	5.93%	3.91%	4.60%	2.93%
	2.38%	2.66%		
2002-2012	7.06%	3.08%	5.38%	1.71%
	5.82%	8.11%		

- **For emerging markets**, we will use the melded default spread approach (where default spreads are scaled up to reflect additional equity risk) to come up with the additional risk premium that we will add to the mature market premium. Thus, markets in countries with lower sovereign ratings will have higher risk premiums that 5.5%.
  - Emerging Market ERP = 5.5% + Country Default Spread$*\left(\frac{\sigma_{\text{Equity}}}{\sigma_{\text{Country Bond}}}\right)$

WHAT ABOUT EQUITY RISK 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.**
- You could **try to compute implied equity risk premiums** but getting the inputs, especially for long term growth are difficult to do.

ONE SOLUTION: BOND DEFAULT SPREADS AS CRP – NOVEMBER 2013

- In November 2013, the equity risk premium for the US was 5.50% Using the default spread on the sovereign bond or based upon the sovereign rating and adding that spread to the mature market premium gives you a total ERP for a country.

Country	Rating	Default Spread (Country Risk Premium)	US ERP	Total ERP for country
India	Baa3	2.25%	5.50%	7.75%
China	Aa3	0.80%	5.50%	6.30%
Brazil	Baa2	2.00%	5.50%	7.50%

- If you prefer CDS spreads:

Country	*Sovereign CDS Spread*	*US ERP*	*Total ERP for country*
India	4.20%	5.50%	9.70%
China	1.20%	5.50%	6.70%
Brazil	2.59%	5.50%	8.09%

BEYOND THE DEFAULT SPREAD? EQUITIES ARE RISKIER THAN BONDS

- While default risk spreads and equity risk premiums are highly correlated, one would expect equity spreads to be higher than debt spreads. One approach to scaling up the premium is to look at the relative volatility of equities to bonds and to scale up the default spread to reflect this:

$$\text{Country Risk Premium} = \text{Country Default Spread} * \left(\frac{\sigma_{\text{Equity}}}{\sigma_{\text{Country Bond}}} \right)$$

- Brazil: The annualized standard deviation in the Brazilian equity index over the previous year is 21 percent, whereas the annualized standard deviation in the Brazilian C-bond is 14 percent.
  - Brazil's Equity Risk Premium = 5.50% + 2.00% (21%/14%) = 8.50%
- Using the same approach for China and India:
  - China's Equity Risk Premium = 5.50% + 0.80% (18%/10%) = 6.94%
  - India's Equity Risk Premium = 5.50% + 2.25% (24%/17%) = 9.10%

THE DATA ISSUES

- **Unrated countries**: There are countries, called frontier markets, which have no ratings, and getting default spreads becomes problematic.
- **Ratings can lag reality or be wrong**: To the extent that countries are misrated (too high or too low), your country default spreads and equity risk premiums will be off.
- **No government bond**: The relative volatility requires that there be a government bond issued by the country in question that is traded. That may not be the case in many countries.
- **Global investor perspective**: The equity risk premiums you estimate will reflect the perspective of an investor who has the choice of moving money across markets. If you are an investor who is forced to invest in a domestic market, the equity risk premium may not apply.

ERP : Nov 2013

Andorra	7.45%	1.95%
Austria	5.50%	0.00%
Belgium	6.70%	1.20%
Cyprus	22.00%	16.50%
Denmark	5.50%	0.00%
Finland	5.50%	0.00%
France	5.95%	0.45%
Germany	5.50%	0.00%
Greece	15.63%	10.13%
Iceland	8.88%	3.38%
Ireland	9.63%	4.13%
Italy	8.50%	3.00%
Liechtenstein	5.50%	0.00%
Luxembourg	5.50%	0.00%
Malta	7.45%	1.95%
Netherlands	5.50%	0.00%
Norway	5.50%	0.00%
Portugal	10.90%	5.40%
Spain	8.88%	3.38%
Sweden	5.50%	0.00%
Switzerland	5.50%	0.00%
Turkey	8.88%	3.38%
United Kingdom	5.95%	0.45%
Western Europe	**6.72%**	**1.22%**

Canada	5.50%	0.00%
United States of America	5.50%	0.00%
North America	**5.50%**	**0.00%**

Argentina	15.63%	10.13%
Belize	19.75%	14.25%
Bolivia	10.90%	5.40%
Brazil	8.50%	3.00%
Chile	6.70%	1.20%
Colombia	8.88%	3.38%
Costa Rica	8.88%	3.38%
Ecuador	17.50%	12.00%
El Salvador	10.90%	5.40%
Guatemala	9.63%	4.13%
Honduras	13.75%	8.25%
Mexico	8.05%	2.55%
Nicaragua	15.63%	10.13%
Panama	8.50%	3.00%
Paraguay	10.90%	5.40%
Peru	8.50%	3.00%
Suriname	10.90%	5.40%
Uruguay	8.88%	3.38%
Venezuela	12.25%	6.75%
Latin America	**9.44%**	**3.94%**

Country	*TRP*	*CRP*
Angola	10.90%	5.40%
Benin	13.75%	8.25%
Botswana	7.15%	1.65%
Burkina Faso	13.75%	8.25%
Cameroon	13.75%	8.25%
Cape Verde	12.25%	6.75%
Egypt	17.50%	12.00%
Gabon	10.90%	5.40%
Ghana	12.25%	6.75%
Kenya	12.25%	6.75%
Morocco	9.63%	4.13%
Mozambique	12.25%	6.75%
Namibia	8.88%	3.38%
Nigeria	10.90%	5.40%
Rwanda	13.75%	8.25%
Senegal	12.25%	6.75%
South Africa	8.05%	2.55%
Tunisia	10.23%	4.73%
Uganda	12.25%	6.75%
Zambia	12.25%	6.75%
Africa	**11.22%**	**5.82%**

Albania	12.25%	6.75%
Armenia	10.23%	4.73%
Azerbaijan	8.88%	3.38%
Belarus	15.63%	10.13%
Bosnia	15.63%	10.13%
Bulgaria	8.50%	3.00%
Croatia	9.63%	4.13%
Czech Republic	6.93%	1.43%
Estonia	6.93%	1.43%
Georgia	10.90%	5.40%
Hungary	9.63%	4.13%
Kazakhstan	8.50%	3.00%
Latvia	8.50%	3.00%
Lithuania	8.05%	2.55%
Macedonia	10.90%	5.40%
Moldova	15.63%	10.13%
Montenegro	10.90%	5.40%
Poland	7.15%	1.65%
Romania	8.88%	3.38%
Russia	8.05%	2.55%
Serbia	10.90%	5.40%
Slovakia	7.15%	1.65%
Slovenia	9.63%	4.13%
Ukraine	15.63%	10.13%
E. Europe & Russia	**8.60%**	**3.10%**

Bahrain	8.05%	2.55%
Israel	6.93%	1.43%
Jordan	12.25%	6.75%
Kuwait	6.40%	0.90%
Lebanon	12.25%	6.75%
Oman	6.93%	1.43%
Qatar	6.40%	0.90%
Saudi Arabia	6.70%	1.20%
United Arab Emirates	6.40%	0.90%
Middle East	**6.88%**	**1.38%**

Bangladesh	10.90%	5.40%
Cambodia	13.75%	8.25%
China	6.94%	1.44%
Fiji	12.25%	6.75%
Hong Kong	5.95%	0.45%
India	9.10%	3.60%
Indonesia	8.88%	3.38%
Japan	6.70%	1.20%
Korea	6.70%	1.20%
Macao	6.70%	1.20%
Malaysia	7.45%	1.95%
Mauritius	8.05%	2.55%
Mongolia	12.25%	6.75%
Pakistan	17.50%	12.00%
Papua NG	12.25%	6.75%
Philippines	9.63%	4.13%
Singapore	5.50%	0.00%
Sri Lanka	12.25%	6.75%
Taiwan	6.70%	1.20%
Thailand	8.05%	2.55%
Vietnam	13.75%	8.25%
Asia	**7.27%**	**1.77%**

Australia	5.50%	0.00%
Cook Islands	12.25%	6.75%
New Zealand	5.50%	0.00%
Australia & NZ	**5.50%**	**0.00%**

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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:

Region/ Country	*Proportion of Disney's Revenues*	*ERP*
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 COMPANIES: NOVEMBER 2013

In November 2013, the mature market premium used was 5.5%

Company	*Region/ Country*	*Weight*	*ERP*
Bookscape	United States	100%	5.50%
Vale	US & Canada	4.90%	5.50%
	Brazil	16.90%	8.50%
	Rest of Latin America	1.70%	10.09%
	China	37.00%	6.94%
	Japan	10.30%	6.70%
	Rest of Asia	8.50%	8.61%
	Europe	17.20%	6.72%
	Rest of World	3.50%	10.06%
	Company	100.00%	7.38%
Tata Motors	India	23.90%	9.10%
	China	23.60%	6.94%
	UK	11.90%	5.95%
	United States	10.00%	5.50%
	Mainland Europe	11.70%	6.85%
	Rest of World	18.90%	6.98%
	Company	100.00%	7.19%
Baidu	China	100%	6.94%
Deutsche Bank	Germany	35.93%	5.50%
	North America	24.72%	5.50%
	Rest of Europe	28.67%	7.02%
	Asia-Pacific	10.68%	7.27%
	South America	0.00%	9.44%
	Company	100.00%	6.12%

AN UPDATED IMPLIED ERP

In the trailing 12 months, across all companies in the index.

Base year cash flow (last 12 mths)
Dividends (TTM): 78.51
+ Buybacks (TTM): 120.47
= Cash to investors (TTM): **198.99**

Expected earnings/cashflow growth in next 5 years
Earnings growth rate of 10.50% based upon analyst estimates for 2026 and 2027 and growth dropping to 4.18% over the following years.

Modified Payout
This computation assumes that the payout ratio changes over time to reflect a sustainable payout ratio = g/ROE, in the stable growth. The resulting ERP is 4.18%

Actual numbers | Forecasted numbers

	Last 12 mths	*2026*	*2027*	*2028*	*2029*	*2030*	*Term Year*
Earnings	271.52	300.03	331.54	366.35	404.82	447.33	466.03
Cash Payout (%)	77.85%	77.85%	77.85%	77.85%	77.85%	77.85%	77.85%
Cash Payout	198.99	$233.58	$258.11	$285.21	$315.16	$348.25	362.81

Earnings and Cash flows grow @4.18% (set equal to US T.Bond rate) a year forever.

S&P 500 on 12/31/25 = **6845.50**

$$6845.50 = \frac{233.58}{(1+r)} + \frac{258.11}{(1+r)^2} + \frac{285.21}{(1+r)^3} + \frac{315.16}{(1+r)^4} + \frac{348.25}{(1+r)^5} + \frac{362.81}{(r-.0418)(1+r)^5}$$

The last term in this equation is the expected index level at the end of year 5 (capturing price appreciation)

Solve for r

r = Implied Expected Return on Stocks = 8.41%

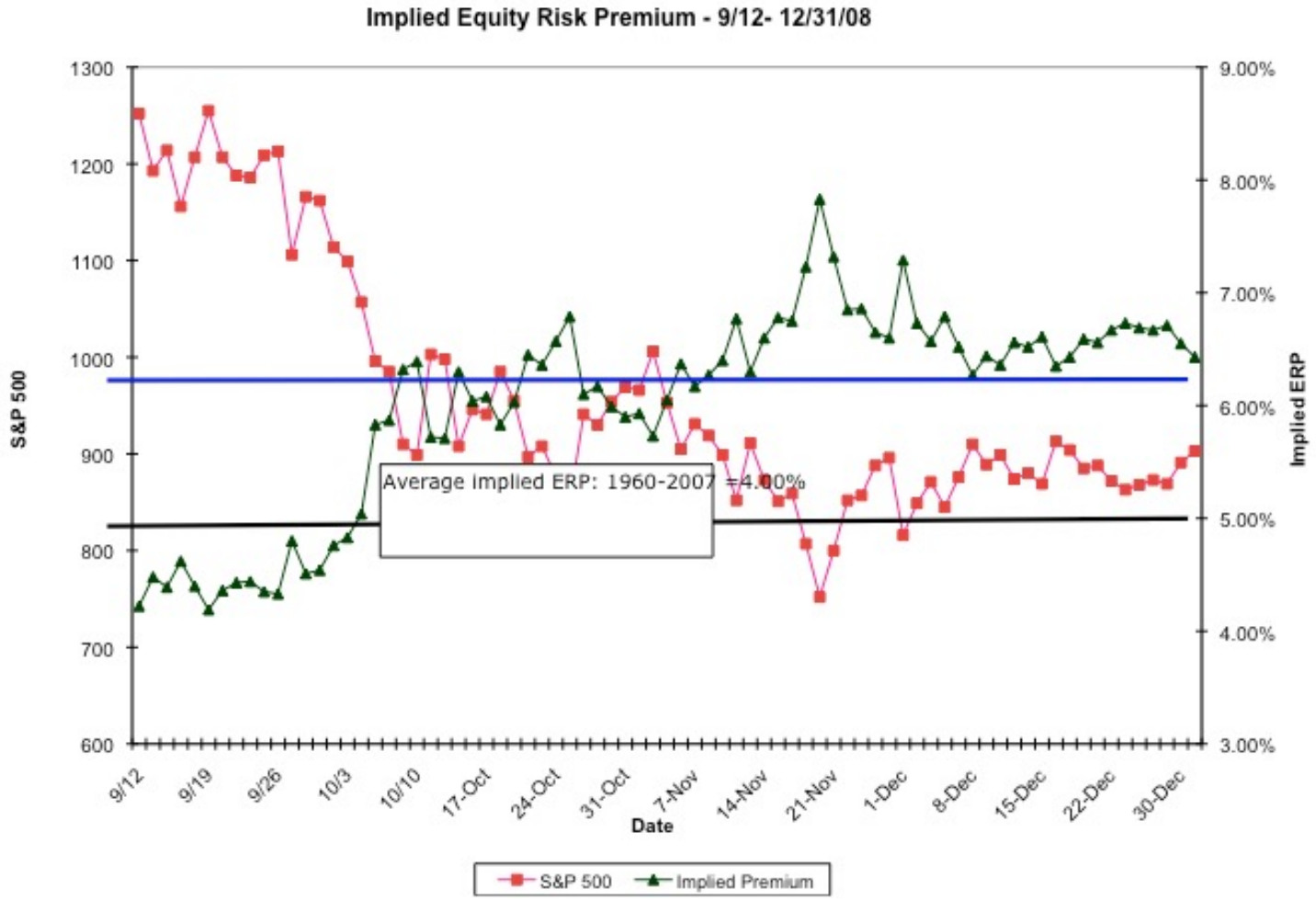
Minus

US $ Risk free rate =10-yr T.Bond rate on 12/31/25 minus Default Spread for Aa1 rating= 4.18% - 0.23% = 3.95%

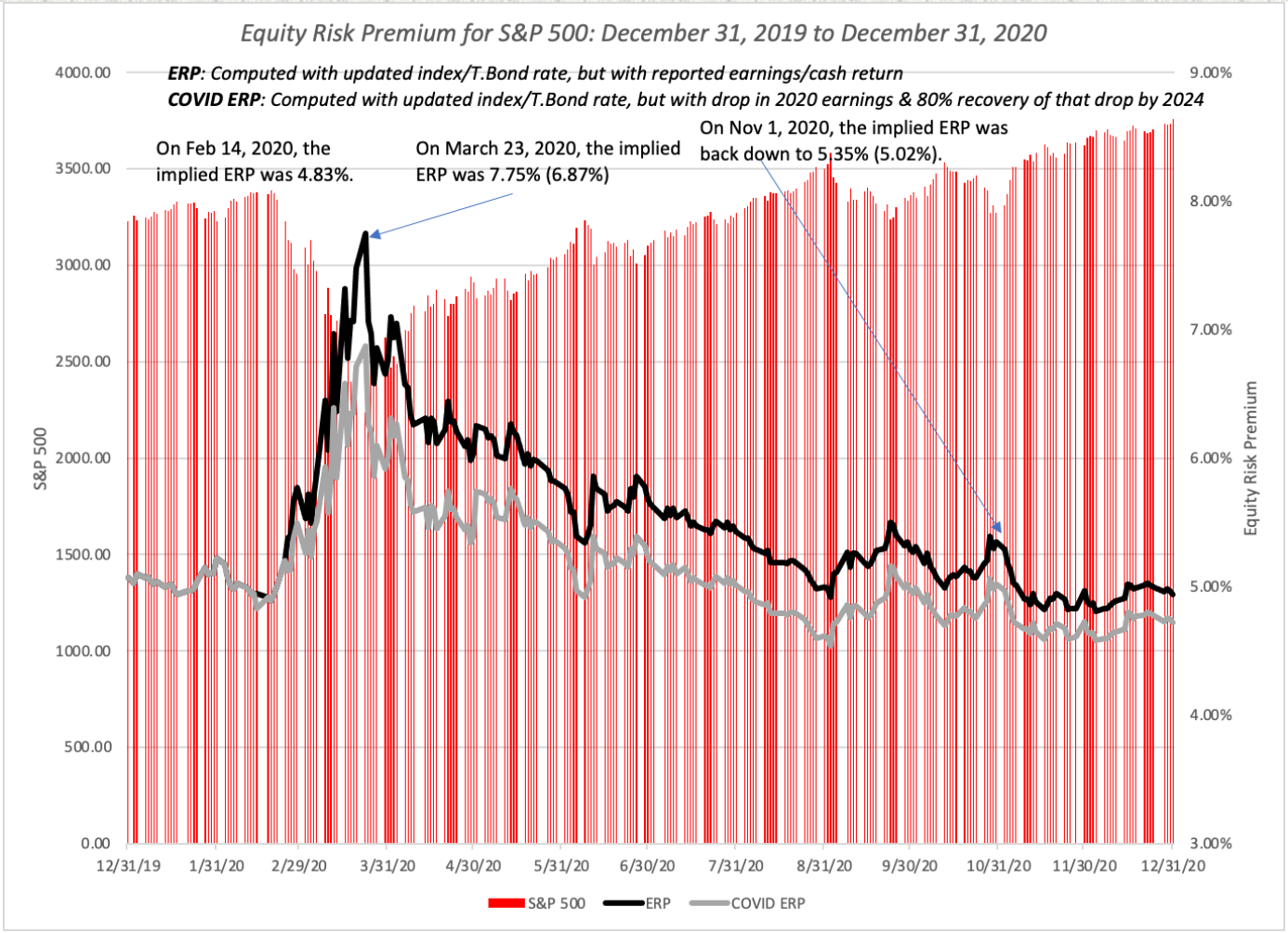
Equals

Implied Equity Risk Premium (12/31/25) = 8.41% - 3.95% = 4.46%

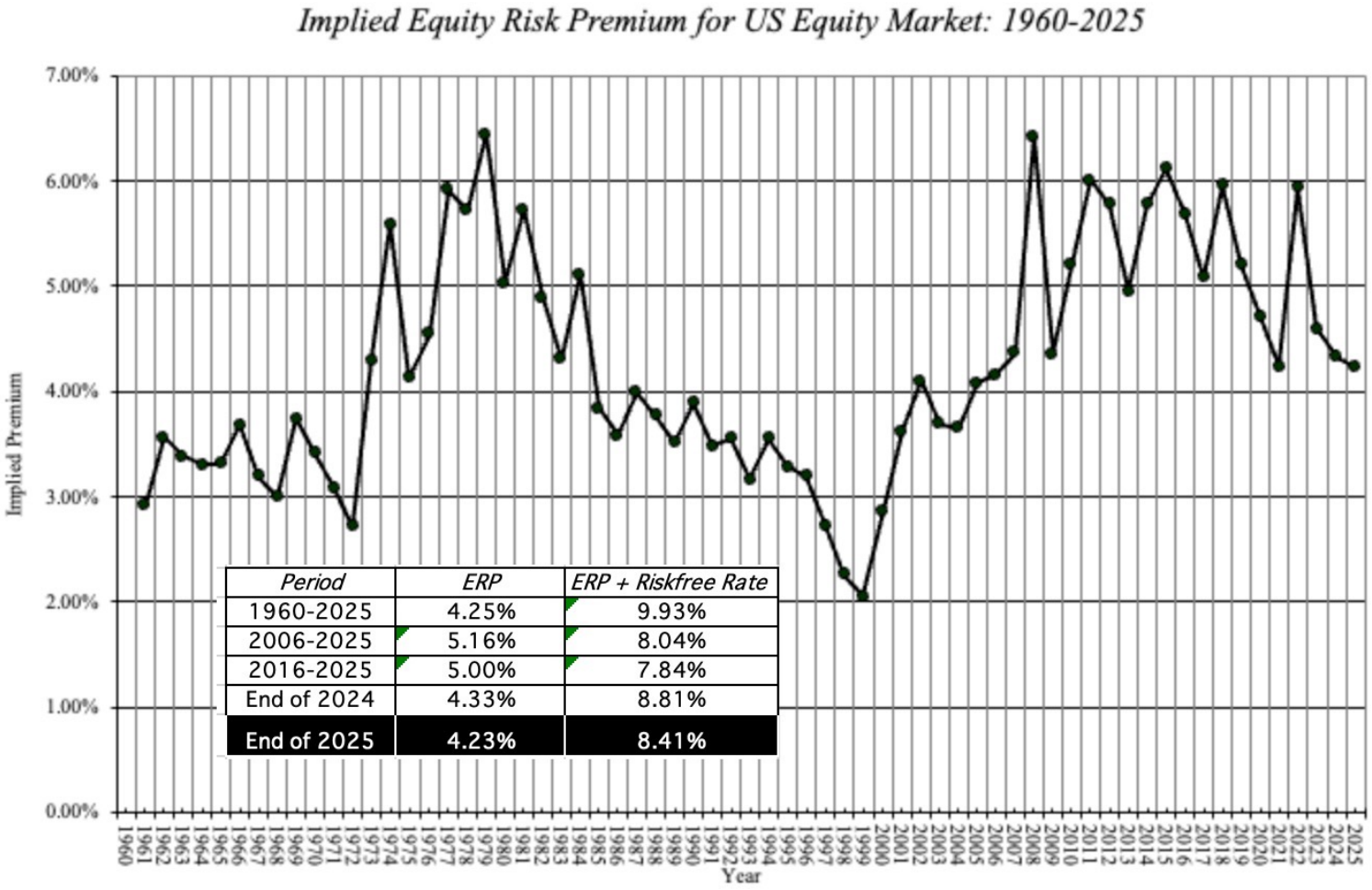
THE ANATOMY OF A CRISIS: IMPLIED ERP FROM SEPTEMBER 12, 2008 TO JANUARY 1, 2009



AND IN 2020.. COVID EFFECTS

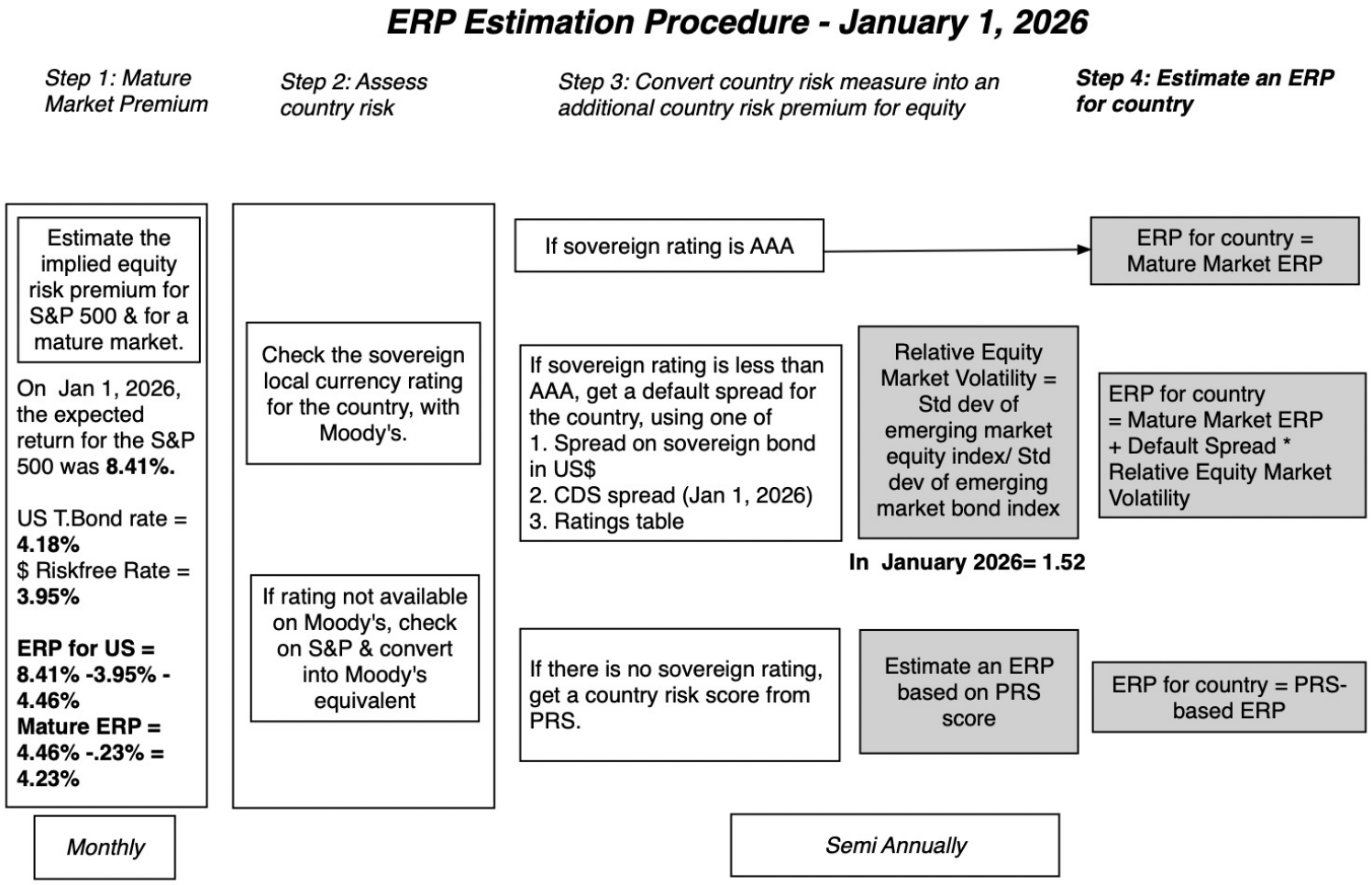


IMPLIED PREMIUMS IN THE US: 1960-2025



Period	ERP	ERP + Riskfree Rate
1960-2025	4.25%	9.93%
2006-2025	5.16%	8.04%
2016-2025	5.00%	7.84%
End of 2024	4.33%	8.81%
End of 2025	4.23%	8.41%

A TEMPLATE FOR ESTIMATING THE ERP



ERP : January 1, 2026

Andorra (Principality of)	Baa1	2.07%	6.30%	Jersey (States of)	Aa3	0.78%	5.01%
Austria	Aa1	0.36%	4.59%	Liechtenstein	Aaa	0.00%	4.23%
Belgium	Aa3	0.78%	5.01%	Luxembourg	Aaa	0.00%	4.23%
Cyprus	A3	1.55%	5.78%	Malta	A2	1.10%	5.33%
Denmark	Aaa	0.00%	4.23%	Netherlands	Aaa	0.00%	4.23%
Finland	Aa1	0.36%	4.59%	Norway	Aaa	0.00%	4.23%
France	Aa3	0.78%	5.01%	Portugal	A3	1.55%	5.78%
Germany	Aaa	0.00%	4.23%	Spain	A3	1.55%	5.78%
Greece	Baa3	2.85%	7.08%	Sweden	Aaa	0.00%	4.23%
Guernsey (States of)	A1	0.91%	5.14%	Switzerland	Aaa	0.00%	4.23%
Iceland	A1	0.91%	5.14%	Turkey	B1	5.83%	10.06%
Ireland	Aa3	0.78%	5.01%	United Kingdom	Aa3	0.78%	5.01%
Isle of Man	Aa3	0.78%	5.01%	**Western Europe**		**1.04%**	5.27%
Italy	Baa2	2.46%	6.69%				

Canada	Aaa	0.00%	4.23%
United States	Aa1	0.23%	4.46%
North America		**0.22%**	4.45%

Caribbean		**7.49%**	11.72%

Argentina	Caa1	9.71%	13.94%
Belize	Caa1	9.71%	13.94%
Bolivia	Ca	15.54%	19.77%
Brazil	Ba1	3.24%	7.47%
Chile	A2	1.10%	5.33%
Colombia	Baa3	2.85%	7.08%
Costa Rica	Ba2	3.90%	8.13%
Ecuador	Caa3	12.95%	17.18%
El Salvador	B3	8.41%	12.64%
Guatemala	Ba1	3.24%	7.47%
Honduras	B1	5.83%	10.06%
Mexico	Baa2	2.46%	6.69%
Nicaragua	B2	7.12%	11.35%
Panama	Baa3	2.85%	7.08%
Paraguay	Baa3	2.85%	7.08%
Peru	Ba1	2.07%	6.30%
Suriname	Caa1	9.71%	13.94%
Uruguay	Ba1	2.07%	6.30%
Venezuela	C	26.66%	30.89%
Latin America		**4.23%**	8.46%

Country	*Rating*	*CRP*	*ERP*
Angola	B3	8.41%	12.64%
Benin	B1	5.83%	10.06%
Botswana	Baa1	2.07%	6.30%
Burkina Faso	Caa1	9.71%	13.94%
Cameroon	Caa1	9.71%	13.94%
Cape Verde	B2	7.12%	11.35%
Congo (Dem Re	B3	8.41%	12.64%
Congo (Rep. of	Caa2	11.66%	15.89%
Côte d'Ivoire	Ba2	3.90%	8.13%
Egypt	Caa1	9.71%	13.94%
Ethiopia	Caa2	11.66%	15.89%
Gabon	Caa2	11.66%	15.89%
Ghana	Caa1	9.71%	13.94%
Kenya	Caa1	9.71%	13.94%
Mali	Caa2	11.66%	15.89%
Mauritius	Baa3	2.85%	7.08%
Morocco	Ba1	3.24%	7.47%
Mozambique	Caa3	12.95%	17.18%
Namibia	B1	5.83%	10.06%
Niger	Caa3	12.95%	17.18%
Nigeria	B3	8.41%	12.64%
Rwanda	B2	7.12%	11.35%
Senegal	Caa1	9.71%	13.94%
South Africa	Ba2	3.90%	8.13%
Swaziland	B2	7.12%	11.35%
Tanzania	B1	5.83%	10.06%
Togo	B3	8.41%	12.64%
Tunisia	Caa1	9.71%	13.94%
Uganda	B3	8.41%	12.64%
Zambia	Caa2	11.66%	15.89%
Africa		**7.72%**	11.95%

Albania	Ba3	4.66%	8.89%
Armenia	Ba3	4.66%	8.89%
Azerbaijan	Baa3	2.85%	7.08%
Belarus	C	26.66%	30.89%
Bosnia and Herzegovina	B3	8.41%	12.64%
Bulgaria	Baa1	2.07%	6.30%
Croatia	A3	1.55%	5.78%
Czech Republic	Aa3	0.78%	5.01%
Estonia	A1	0.91%	5.14%
Georgia	Ba2	3.90%	8.13%
Hungary	Baa2	2.46%	6.69%
Kazakhstan	Baa1	2.07%	6.30%
Kyrgyzstan	B3	8.41%	12.64%
Latvia	A3	1.55%	5.78%
Lithuania	A2	1.10%	5.33%
Macedonia	Ba3	4.66%	8.89%
Moldova	B3	8.41%	12.64%
Montenegro	B1	5.83%	10.06%
Poland	A2	1.10%	5.33%
Romania	Baa3	2.85%	7.08%
Serbia	Ba2	3.90%	8.13%
Slovakia	A3	1.55%	5.78%
Slovenia	A3	1.55%	5.78%
Tajikistan	B3	8.41%	12.64%
Ukraine	Ca	15.54%	19.77%
Uzbekistan	Ba3	4.66%	8.89%
E. Europe (no Russia)		**3.35%**	7.58%

Abu Dhabi	Aa2	0.64%	4.87%
Bahrain	B2	7.12%	11.35%
Iraq	Caa1	9.71%	13.94%
Israel	Baa1	2.07%	6.30%
Jordan	Ba3	4.66%	8.89%
Kuwait	A1	0.91%	5.14%
Lebanon	C	26.66%	30.89%
Oman	Baa3	2.85%	7.08%
Qatar	Aa2	0.64%	4.87%
Ras Al Khaimah	A3	1.55%	5.78%
Saudi Arabia	Aa3	0.78%	5.01%
Sharjah	Ba1	3.24%	7.47%
United Arab Emirates	Aa2	0.64%	4.87%
Middle East		**2.01%**	6.24%

Country	*PRS*	*CRP*	*ERP*
Algeria	67	5.83%	10.06%
Brunei	80.75	0.78%	5.01%
Gambia	65.5	7.12%	11.35%
Guinea	59.5	11.66%	15.89%
Guinea-Bissa	60.75	9.71%	13.94%
Guyana	75.5	2.07%	6.30%
Haiti	56.75	12.95%	17.18%
Iran	61.25	9.71%	13.94%
Korea, D.P.R.	51	15.54%	19.77%
Liberia	57.75	11.66%	15.89%
Libya	71.5	3.90%	8.13%
Madagascar	62.5	8.41%	12.64%
Malawi	56	12.95%	17.18%
Myanmar	54.75	15.54%	19.77%
Russia	70.25	3.90%	8.13%
Sierra Leone	62.75	8.41%	12.64%
Somalia	55.5	12.95%	17.18%
Sudan	47.75	26.66%	30.89%
Syria	51.5	15.54%	19.77%
Yemen, Repu	51.75	15.54%	19.77%
Zimbabwe	58.5	11.66%	15.89%

Bangladesh	B2	7.12%	11.35%
Cambodia	B2	7.12%	11.35%
China	A1	0.91%	5.14%
Fiji	B1	5.83%	10.06%
Hong Kong	Aa3	0.78%	5.01%
India	Baa3	2.85%	7.08%
Indonesia	Baa2	2.46%	6.69%
Japan	A1	0.91%	5.14%
Korea	Aa2	0.64%	4.87%
Laos	Caa2	11.66%	15.89%
Macao	Aa3	0.78%	5.01%
Malaysia	A3	1.55%	5.78%
Maldives	Caa2	11.66%	15.89%
Mongolia	B1	5.83%	10.06%
Nepal	Ba3	4.66%	8.89%
Pakistan	Caa1	9.71%	13.94%
Papua New Guinea	B2	7.12%	11.35%
Philippines	Baa2	2.46%	6.69%
Singapore	Aaa	0.00%	4.23%
Solomon Islands	Caa1	9.71%	13.94%
Sri Lanka	Ca	15.54%	19.77%
Taiwan	Aa3	0.78%	5.01%
Thailand	Baa1	2.07%	6.30%
Vietnam	Ba2	3.90%	8.13%
Asia		**1.49%**	5.72%

Australia	Aaa	0.00%	4.23%
Cook Islands	B1	5.83%	10.06%
New Zealand	Aaa	0.00%	4.23%
Australia & NZ		**0.00%**	4.23%

Aswath Damodaran

Region: GDP-weighted average

Blue: Moody's Rating
Red: Added Country Risk
Green #: Total ERP

APPLICATION TEST: ESTIMATING AN EQUITY RISK PREMIUM FOR YOUR COMPANY!

- For your company, **get the geographical breakdown of revenues in the most recent year.** Based upon this revenue breakdown and the most recent country risk premiums, estimate the equity risk premium that you would use for your company.

- This computation was **based entirely on revenues.** With your company, what concerns would you have about your estimate being too high or too low?

ESTIMATING BETA

- The standard procedure for estimating betas is to regress stock returns (Rj) against market returns (Rm):

$$R_j = a + b\, R_m$$

  - 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.
-

ESTIMATING PERFORMANCE

- The intercept of the regression provides a simple measure of performance during the period of the regression, relative to the capital asset pricing model.
  - Rj = Rf + b (Rm - Rf)
  - = Rf (1-b) + b Rm ..... Capital Asset Pricing Model
  - Rj = a + b Rm ..... Regression Equation
- If
  - a > Rf (1-b) .... Stock did better than expected during regression period
  - a = Rf (1-b) .... Stock did as well as expected during regression period
  - a < Rf (1-b) .... Stock did worse than expected during regression period
- The difference between the intercept and Rf (1-b) is Jensen's alpha. If it is positive, your stock did perform better than expected during the period of the regression.

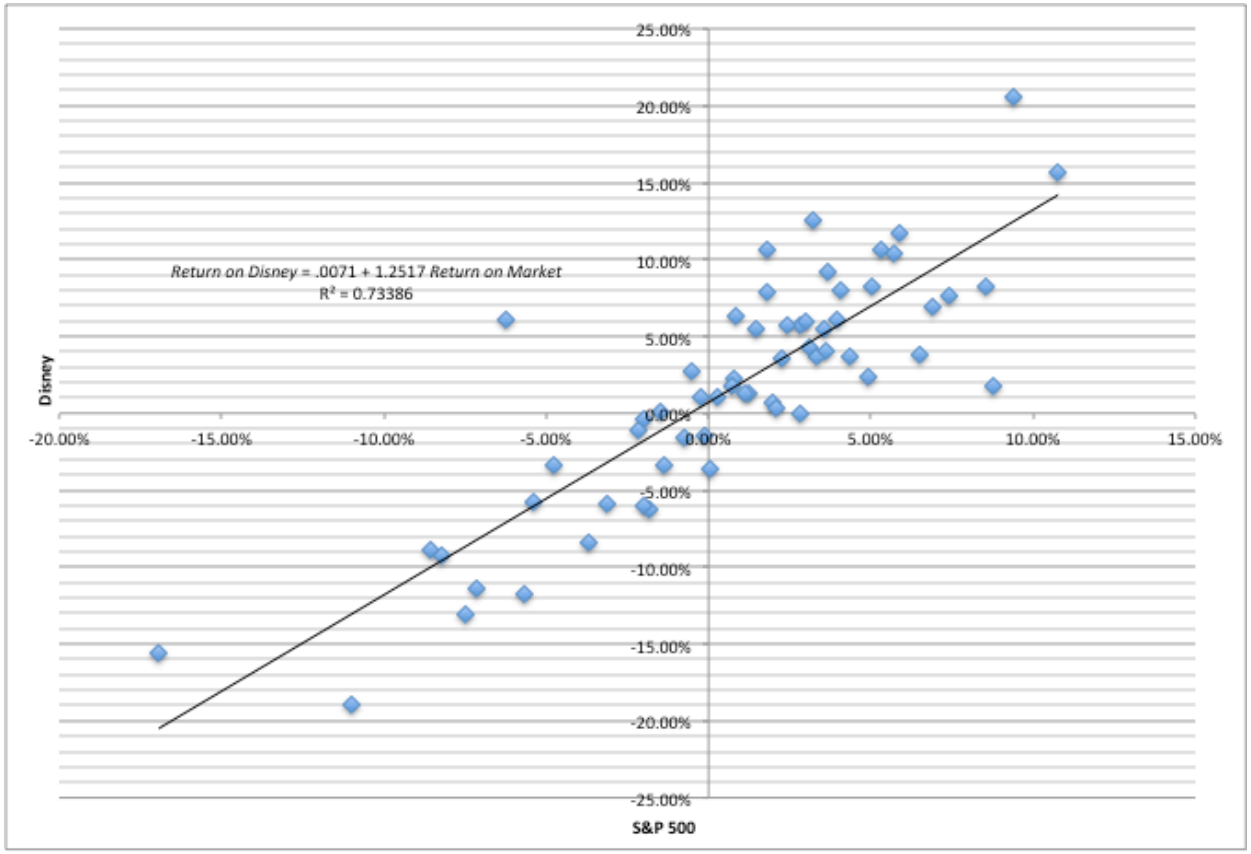
SETTING UP FOR THE ESTIMATION

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

CHOOSING THE PARAMETERS: DISNEY

- Period used: 5 years
- Return Interval: Monthly
- Market Index: S&P 500 Index.
- For instance, to calculate returns on Disney in December 2009,
  - Price for Disney at end of November 2009 = $ 30.22
  - Price for Disney at end of December 2009 = $ 32.25
  - Dividends during month = $0.35 (It was an ex-dividend month)
  - Disney Return =($32.25 - $30.22 + $ 0.35)/$30.22= 7.88%
- To estimate returns on the index in the same month
  - Index level at end of November 2009 = 1095.63
  - Index level at end of December 2009 = 1115.10
  - Dividends on index in December 2009 = 1.683
  - S&P 500 Return =(1115.1 – 1095.63+1.683)/ 1095.63 = 1.78%

DISNEY'S HISTORICAL BETA



Return on Disney = .0071 + 1.2517 *Return on Market* $R^2 = 0.73386$

(.0053) (0.10)

ANALYZING DISNEY'S PERFORMANCE

- Intercept = 0.712%
  - This is an intercept based on monthly returns. Thus, it has to be compared to a monthly riskfree rate.
  - Between 2008 and 2013
    - Average Annualized T.Bill rate = 0.50%
    - Monthly Riskfree Rate = 0.5%/12 = 0.042%
    - Riskfree Rate (1-Beta) = 0.042% (1-1.252) = -.0105%
- The Comparison is then between
  - Intercept versus Riskfree Rate (1 - Beta)
  - 0.712% versus 0.0105%
  - Jensen's Alpha = 0.712% - (-0.0105)% = 0.723%
- Disney did 0.723% better than expected, per month, between October 2008 and September 2013
  - Annualized, Disney's annual excess return = $(1.00723)^{12}$ -1= 9.02%

MORE ON JENSEN'S ALPHA

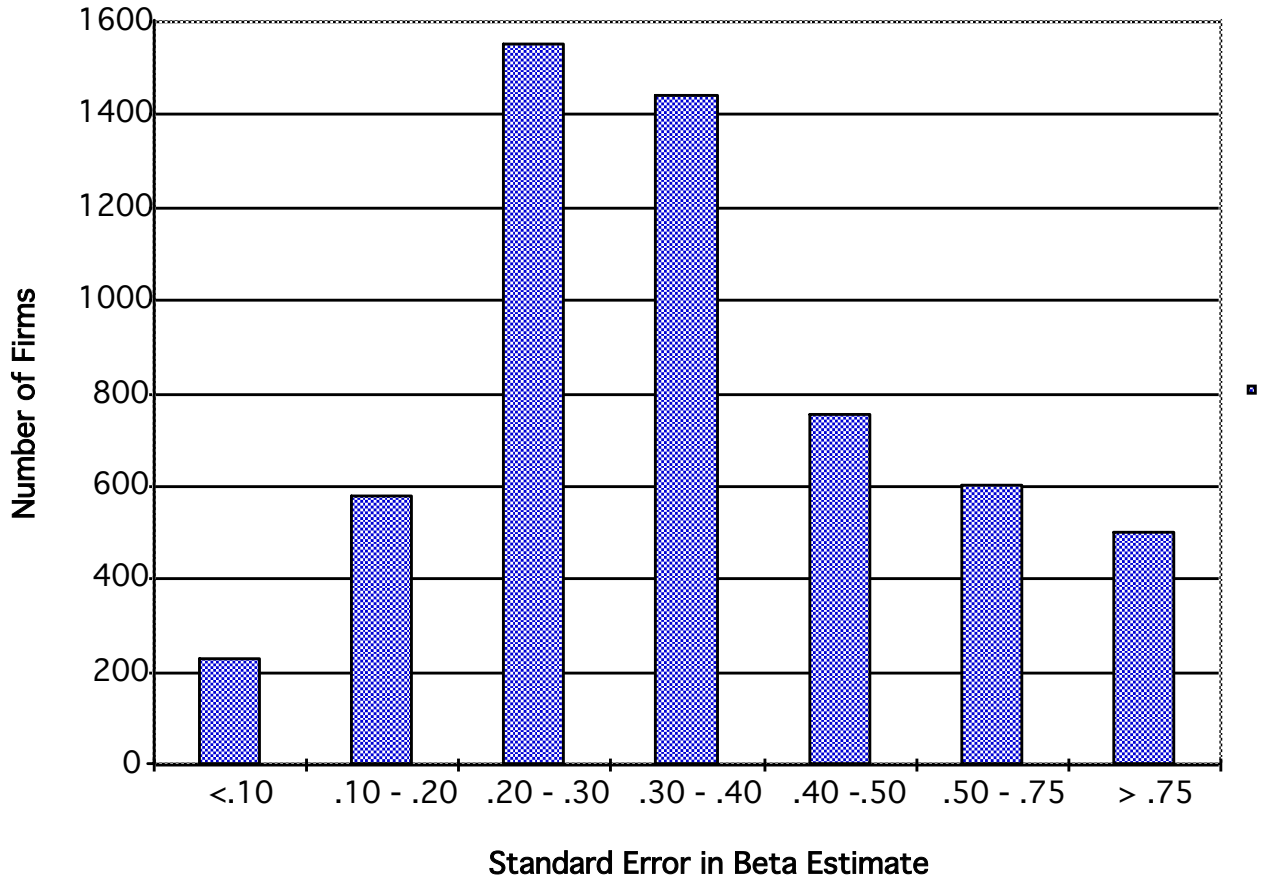
- If you did this analysis on every stock listed on an exchange, what would the average Jensen's alpha be across all stocks?
  a. Depend upon whether the market went up or down during the period
  b. Should be zero
  c. Should be greater than zero, because stocks tend to go up more often than down.
- Disney has a positive Jensen's alpha of 9.02% a year between 2008 and 2013. This can be viewed as a sign that management in the firm did a good job, managing the firm during the period.
  a. True
  b. False
- Disney has had a positive Jensen's alpha between 2008 and 2013. If you were an investor in early 2014, looking at the stock, you would view this as a sign that the stock will be a:
  a. Good investment for the future
  b. Bad investment for the future
  c. No information about the future

ESTIMATING DISNEY'S BETA

- The **slope of the regression** of 1.25 is the beta.
- The regression parameters are **always estimated with error.** The error is captured in the standard error of the beta estimate, which in the case of Disney is 0.10.
- Assume that I asked you what Disney's true beta is, after this regression.
  - What is your best point estimate?
  - What range would you give me, with 67% confidence?
  - What range would you give me, with 95% confidence?

THE DIRTY SECRET OF "STANDARD ERROR"

Distribution of Standard Errors: Beta Estimates for U.S. stocks



BREAKING DOWN DISNEY'S RISK

- The R Squared = 73%. This implies that
  - 73% of the risk at Disney comes from market sources
  - 27%, therefore, comes from firm-specific sources
- If investors diversify, the firm-specific risk is diversifiable and will not be rewarded. It is only the market risk that will be rewarded with a higher expected return.
- The R-squared for companies, globally, has increased significantly since 2008.

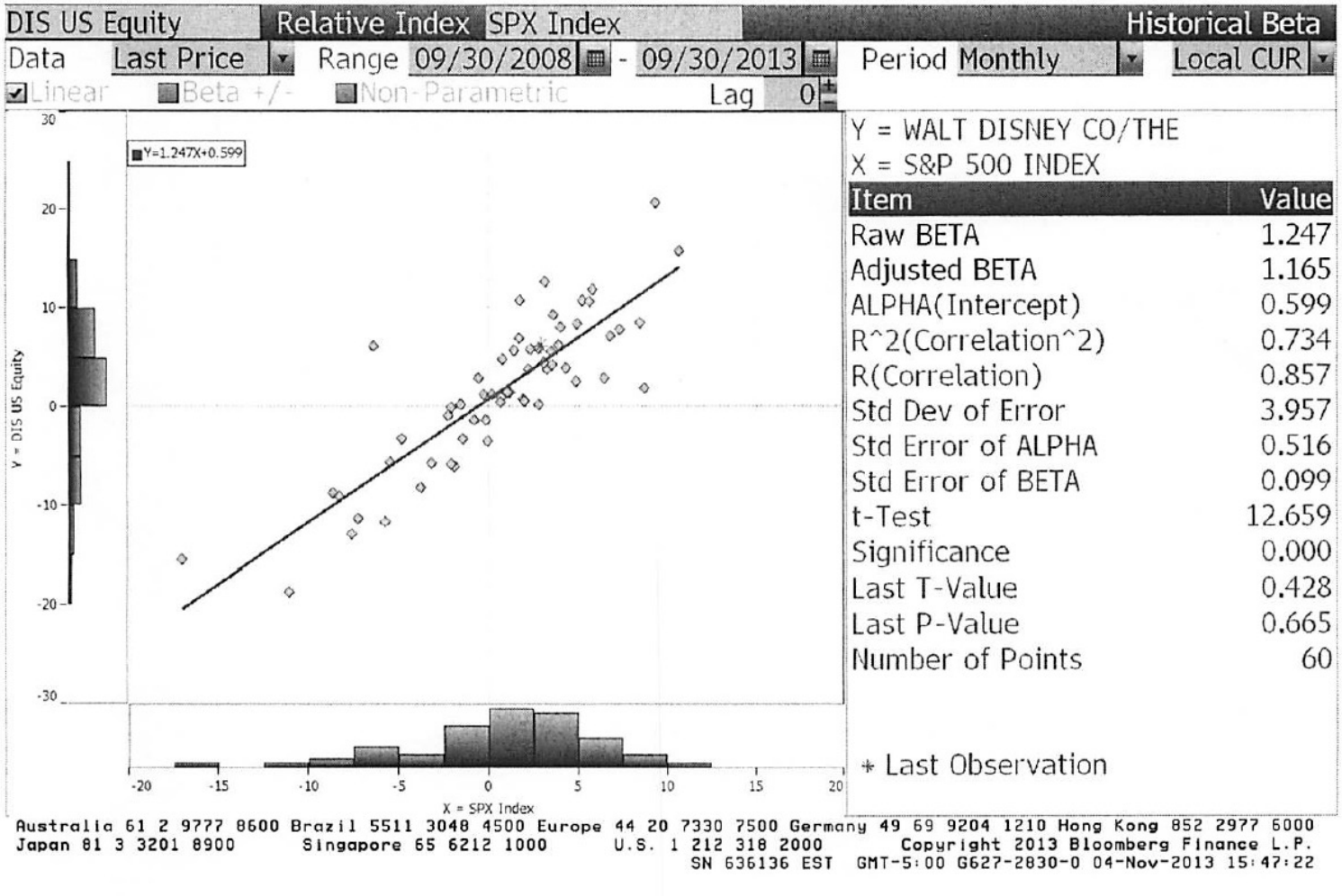
a. Why might this be happening?

b. What are the implications for investors?

THE RELEVANCE OF R SQUARED

- You are a diversified investor trying to decide whether you should invest in Disney or Amgen. Both companies have betas of 1.25, but Disney has an R Squared of 73% while Amgen's R squared is only 25%. Which one would you invest in?
  a. Amgen, because it has the lower R squared
  b. Disney, because it has the higher R squared
  c. You would be indifferent
- Would your answer be different if you were an undiversified investor?

BETA ESTIMATION: USING A SERVICE (BLOOMBERG)



ESTIMATING EXPECTED RETURNS FOR DISNEY IN NOVEMBER 2013

- Inputs to the expected return calculation
  - Disney's Beta = 1.25
  - Riskfree Rate = 2.75% (U.S. ten-year T.Bond rate in November 2013)
  - Risk Premium = 5.76% (Based on Disney's operating exposure)
- Expected Return = Riskfree Rate + Beta (Risk Premium)

  = 2.75% + 1.25 (5.76%) = 9.95%

USE TO A POTENTIAL INVESTOR IN DISNEY

- As a potential investor in Disney, what does this expected return of 9.95% tell you?
  a. This is the return that I can expect to make in the long term on Disney, if the stock is correctly priced and the CAPM is the right model for risk,
  b. This is the return that I need to make on Disney in the long term to break even on my investment in the stock
  c. Both
- Assume now that you are an active investor and that your research suggests that an investment in Disney will yield 12.5% a year for the next 5 years. Based upon the expected return of 9.95%, you would
  a. Buy the stock
  b. Sell the stock

HOW MANAGERS USE THIS EXPECTED RETURN

- Managers at Disney
  - need to make at least 9.95% as a return for their equity investors to break even.
  - this is the hurdle rate for projects, when the investment is analyzed from an equity standpoint
- In other words, Disney's cost of equity is 9.95% and it should try to deliver a return on equity that exceeds this value.
- What is the cost of not delivering this cost of equity?

APPLICATION TEST: ANALYZING THE RISK REGRESSION

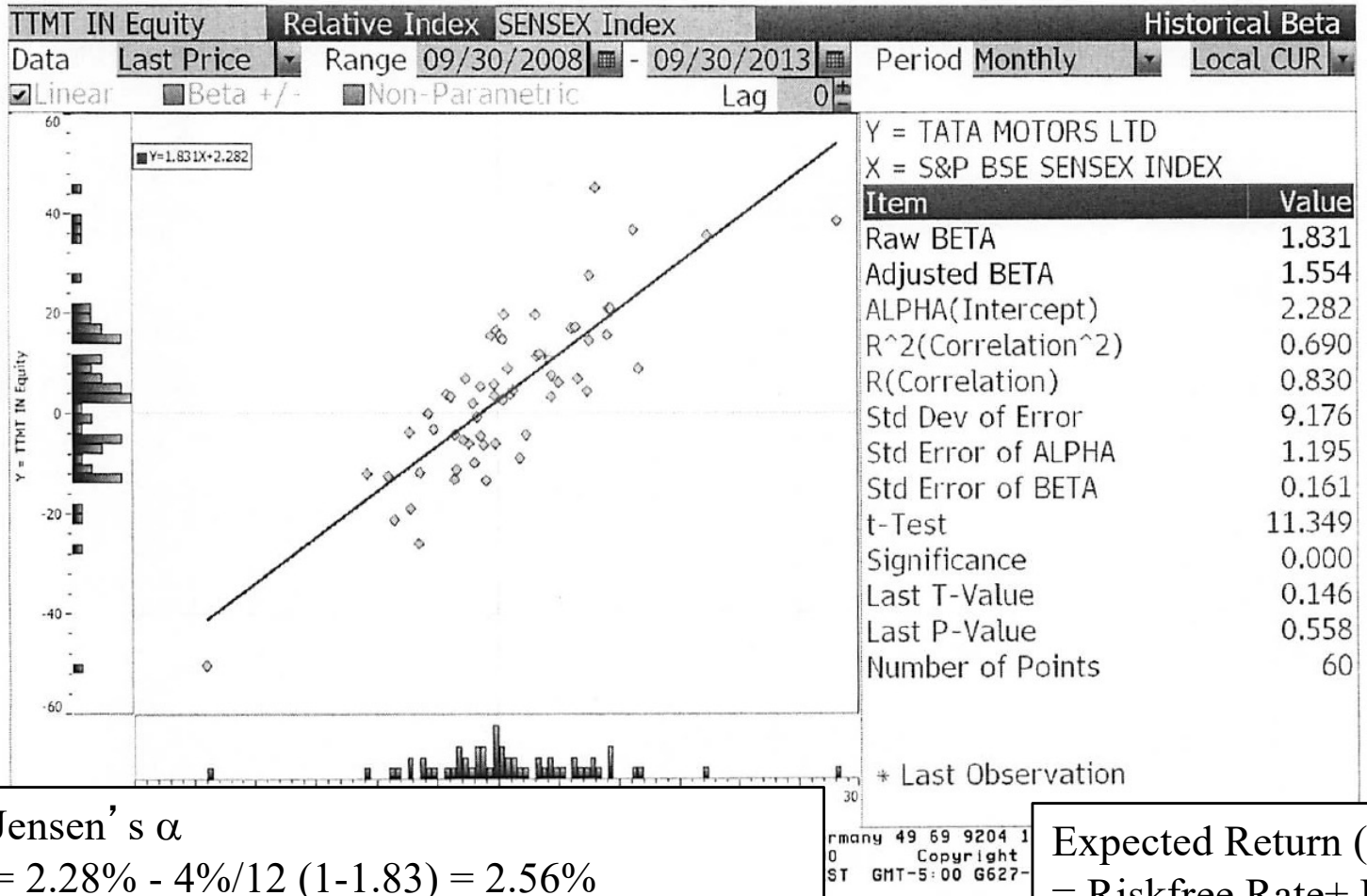
- Using your Bloomberg risk and return print out, answer the following questions:
  - How well or badly did your stock do, relative to the market, during the period of the regression?
  - Intercept - (Riskfree Rate/n) (1- Beta) = Jensen's Alpha
    - where n is the number of return periods in a year (12 if monthly; 52 if weekly)
  - What proportion of the risk in your stock is attributable to the market? What proportion is firm-specific?
  - What is the historical estimate of beta for your stock? What is the range on this estimate with 67% probability? With 95% probability?
  - Based upon this beta, what is your estimate of the required return on this stock?
  - Riskless Rate + Beta * Risk Premium

A QUICK TEST

- You are advising a very risky software firm on the right cost of equity to use in project analysis. You estimate a beta of 3.0 for the firm and come up with a cost of equity of 20%. The CFO of the firm is concerned about the high cost of equity and wants to know whether there is anything he can do to lower his beta.
- How do you bring your beta down?

- Should you focus your attention on bringing your beta down?
  - Yes
  - No

REGRESSION DIAGNOSTICS FOR TATA MOTORS



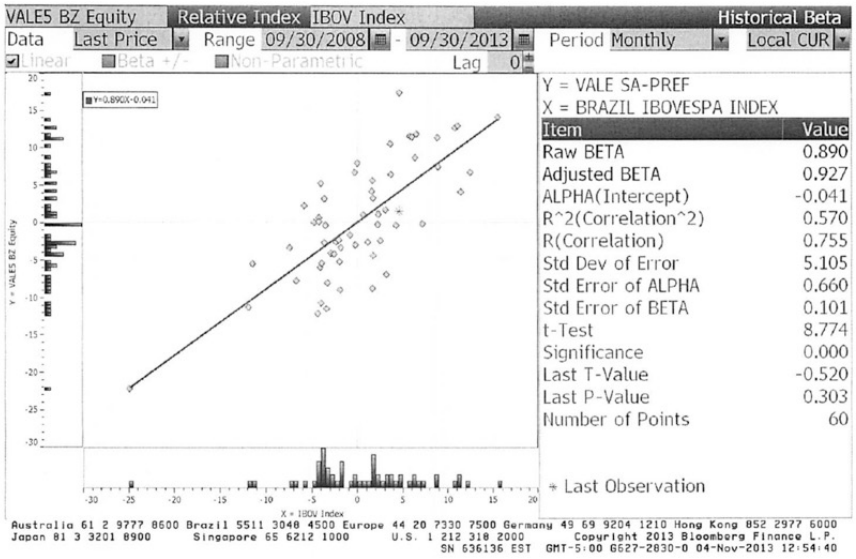
Beta = 1.83
67% range
1.67-1.99

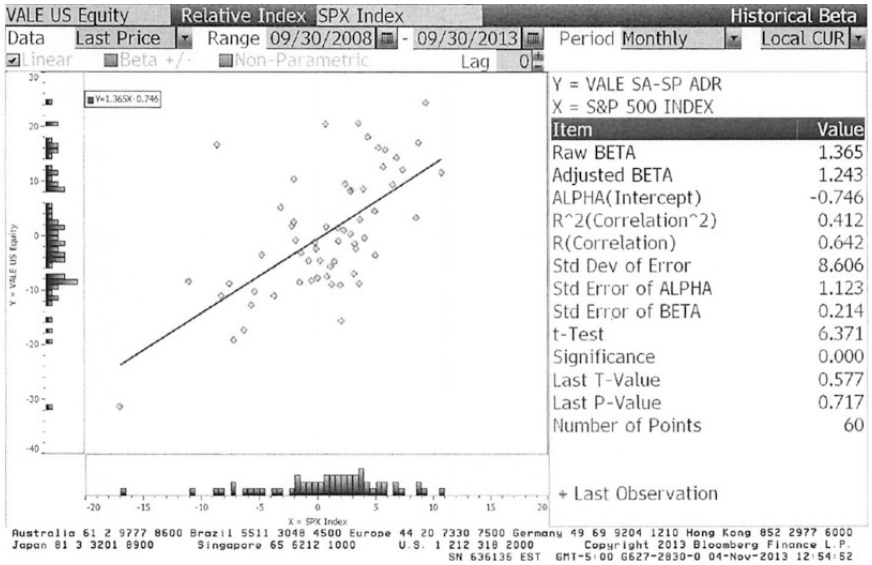
69% market risk
31% firm specific

Jensen's α
= 2.28% - 4%/12 (1-1.83) = 2.56%
Annualized = $(1+.0256)^{12}$-1= 35.42%
Average monthly riskfree rate (2008-13) = 4%

Expected Return (in Rupees)
= Riskfree Rate+ Beta*Risk premium
= 6.57%+ 1.83 (7.19%) = 19.73%

A BETTER BETA? FOR VALE..





DEUTSCHE BANK AND BAIDU: INDEX EFFECTS ON RISK PARAMETERS

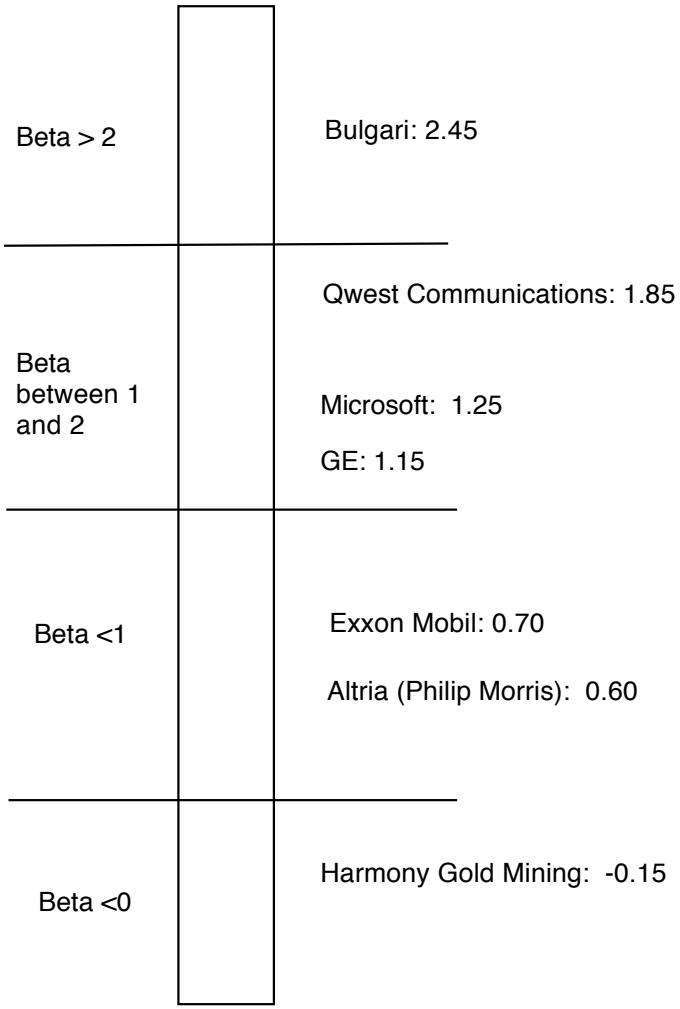
- For Deutsche Bank, a widely held European stock, we tried both the DAX (German index) and the FTSE European index.

	DAX	*FTSE Euro 100*
Intercept	-0.90%	-0.15%
Beta	1.58	1.98
Std Error of beta	0.21	0.29
R^2	51%	29%

- For Baidu, a NASDAQ listed stock, we ran regressions against both the S&P 500 and the NASDAQ.

	S&P 500	*NASDAQ*
Intercept	2.84%	2.15%
Beta	1.63	1.65
Std Error of beta	0.28	0.23
R^2	37%	47%

BETA: EXPLORING FUNDAMENTALS



DETERMINANT 1: PRODUCT/ SERVICE TYPE

- Betas measure a company's exposure to macroeconomic risks. Consequently, you would expect the beta to be a function of the **sensitivity of the demand for its products and services to macroeconomic factors.**
  - To the extent that **cyclical companies are more likely to move with the macroeconomy, they are** likely to have higher betas.
  - Firms which sell more discretionary products will have higher betas than firms that sell less discretionary product

A SIMPLE TEST

- Phone service is close to being non-discretionary in the United States and Western Europe. However, in much of Asia and Latin America, there are large segments of the population for which phone service is a luxury.
- Given our discussion of discretionary and non-discretionary products, which of the following conclusions would you be willing to draw:
  a. Emerging market telecom companies should have higher betas than developed market telecom companies.
  b. Developed market telecom companies should have higher betas than emerging market telecom companies
  c. The two groups of companies should have similar betas

DETERMINANT 2: OPERATING LEVERAGE EFFECTS

- Operating leverage refers to the proportion of the total costs of the firm that are fixed.
- When a company has higher fixed costs, small changes in revenues will translate into larger changes in earnings, and by extension, into more variable earnings.
  - Other things remaining equal, sectors with **higher operating leverage should have higher betas** than sectors with less operating leverage.
  - Within sectors, companies with **more flexible cost structures (where costs adjust more quickly to revenues) should have lower betas** than companies with more rigid cost structures.

MEASURES OF OPERATING LEVERAGE

- Fixed Costs Measure = Fixed Costs / Variable Costs
  - This measures the **relationship between fixed and variable costs.** The higher the proportion, the higher the operating leverage.
  - The problem with this measure is that companies **do not break costs down into fixed and variable.**
- EBIT Variability Measure = % Change in EBIT / % Change in Revenues
  - This measures **how quickly the earnings before interest and taxes changes as revenue changes.** The higher this number, the greater the operating leverage.
  - There is **noise in this number** on a year-to-year basis.

DISNEY'S OPERATING LEVERAGE: 1987- 2013

Year	Net Sales	% Change in Sales	EBIT	% Change in EBIT
1987	$2,877		$756	
1988	$3,438	19.50%	$848	12.17%
1989	$4,594	33.62%	$1,177	38.80%
1990	$5,844	27.21%	$1,368	16.23%
1991	$6,182	5.78%	$1,124	-17.84%
1992	$7,504	21.38%	$1,287	14.50%
1993	$8,529	13.66%	$1,560	21.21%
1994	$10,055	17.89%	$1,804	15.64%
1995	$12,112	20.46%	$2,262	25.39%
1996	$18,739	54.71%	$3,024	33.69%
1997	$22,473	19.93%	$3,945	30.46%
1998	$22,976	2.24%	$3,843	-2.59%
1999	$23,435	2.00%	$3,580	-6.84%
2000	$25,418	8.46%	$2,525	-29.47%
2001	$25,172	-0.97%	$2,832	12.16%
2002	$25,329	0.62%	$2,384	-15.82%
2003	$27,061	6.84%	$2,713	13.80%
2004	$30,752	13.64%	$4,048	49.21%
2005	$31,944	3.88%	$4,107	1.46%
2006	$33,747	5.64%	$5,355	30.39%
2007	$35,510	5.22%	$6,829	27.53%
2008	$37,843	6.57%	$7,404	8.42%
2009	$36,149	-4.48%	$5,697	-23.06%
2010	$38,063	5.29%	$6,726	18.06%
2011	$40,893	7.44%	$7,781	15.69%
2012	$42,278	3.39%	$8,863	13.91%
2013	$45,041	6.54%	$9,450	6.62%
Average: 87-13		**11.79%**		**11.91%**
Average: 96-13		**8.16%**		**10.20%**

The average for this statistic across entertainment companies is 1.15.

Operating Leverage
11.91/11.79 =1.01
10.20/8.16 =1.25

DETERMINANT 3: FINANCIAL LEVERAGE

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

$$\beta_{Levered} = \beta_{unlevered}\,(1 + ((1-t)D/E))$$

where

- β_L = Levered or Equity Beta D/E = Market value Debt to equity ratio
- β_u = Unlevered or Asset Beta t = Marginal tax rate

- Earlier, we estimated the beta for Disney from a regression. Was that beta a levered or unlevered beta?
  a. Levered
  b. Unlevered

EFFECTS OF LEVERAGE ON BETAS: DISNEY

- The regression beta for Disney is 1.25. This beta is a levered beta (because it is based on stock prices, which reflect leverage) and the leverage implicit in the beta estimate is the average market debt equity ratio during the period of the regression (2008 to 2013)
  - The average debt equity ratio during this period was 19.44%.
  - The unlevered beta for Disney can then be estimated (using a marginal tax rate of 36.1%)
    - Disney's Unlevered Beta

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

    = 1.25 / (1 + (1 - 0.361)(0.1944))= 1.11

DISNEY : BETA AND FINANCIAL LEVERAGE

Debt to Capital	*Debt/Equity Ratio*	*Beta*	*Effect of Leverage*
0.00%	0.00%	1.11	0.00
10.00%	11.11%	1.1908	0.08
20.00%	25.00%	1.29	0.18
30.00%	42.86%	1.42	0.30
40.00%	66.67%	1.59	0.47
50.00%	100.00%	1.82	0.71
60.00%	150.00%	2.18	1.07
70.00%	233.33%	2.77	1.66
80.00%	400.00%	3.95	2.84
90.00%	900.00%	7.51	6.39

BETAS ARE WEIGHTED AVERAGES

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

THE DISNEY/CAP CITIES MERGER (1996): PRE-MERGER

Disney: The Acquirer

Equity Beta
1.15

Debt = $3,186 million
Market value of equity = $31,100 million
Debt + Equity = Firm value = $31,100 + $3186 = $34,286 million
D/E Ratio = 3186/31100 = 0.10

+

Capital Cities: The Target

Equity Beta
0.95

Debt = $ 615 million
Market value of equity = $18, 500 million
Debt + Equity = Firm value = $18,500 + $615 = $19,115 million
D/E Ratio = 615/18500 = 0.03

DISNEY CAP CITIES BETA ESTIMATION: STEP 1

- Calculate the unlevered betas for both firms
  - Disney's unlevered beta = 1.15/(1+0.64*0.10) = 1.08
  - Cap Cities unlevered beta = 0.95/(1+0.64*0.03) = 0.93
- Calculate the unlevered beta for the combined firm
  - Unlevered Beta for combined firm

  = 1.08 (34286/53401) + 0.93 (19115/53401)

  = 1.026
  - The weights used are the firm values (and not just the equity values) of the two firms, since these are unlevered betas and thus reflects the risks of the entire businesses and not just the equity]

DISNEY CAP CITIES BETA ESTIMATION: STEP 2

- If Disney had **used all equity** to buy Cap Cities equity, while assuming Cap Cities debt, the consolidated numbers would have looked as follows:
  - Debt = $ 3,186+ $615 = $ 3,801 million
  - Equity = $ 31,100 + $18,500 = $ 49,600 m (Disney issues $18.5 billion in equity)
  - D/E Ratio = 3,801/49600 = 7.66%
  - New Beta = 1.026 (1 + 0.64 (.0766)) = 1.08
- Since Disney **borrowed $ 10 billion** to buy Cap Cities/ABC, funded the rest with new equity and assumed Cap Cities debt:
  - The market value of Cap Cities equity is $18.5 billion. If $ 10 billion comes from debt, the balance ($8.5 billion) has to come from new equity.
  - Debt = $ 3,186 + $615 million + $ 10,000 = $ 13,801 million
  - Equity = $ 31,100 + $8,500 = $39,600 million
  - D/E Ratio = 13,801/39600 = 34.82%
  - New Beta = 1.026 (1 + 0.64 (.3482)) = 1.25

FIRM BETAS VERSUS DIVISIONAL BETAS

- **Firm Betas as weighted averages: The beta of a firm is the weighted average of the betas** of its individual projects.
  - Since betas measure exposure to macro risk, if the projects are all in the same line of business, they may all share the same unlevered beta.
  - If the projects vary in their macroeconomic risk exposure, the project betas will also vary.
- **Firm Betas and Business betas**: At a broader level of aggregation, the beta of a multi-business firm is the weighted average of the betas of the different businesses that they operate in.

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 c**urrent (and even expected future) mix of busine**sses that the firm is in rather than the historical mix

DISNEY'S BUSINESSES: THE FINANCIAL BREAKDOWN (FROM 2013 ANNUAL REPORT)

Business	*Revenues*	*Operating Income*	*D&A*	*EBITDA*	*S, G & A Costs*	*Cap Ex*	*Identifiable Assets*
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

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

Business	*Comparable firms*	*Sample size*	*Median Beta*	*Median D/E*	*Median Tax rate*	*Company Unlevered Beta*	*Median Cash/ Firm Value*	*Business Unlevered Beta*
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

A CLOSER LOOK AT THE PROCESS...
STUDIO ENTERTAINMENT BETAS

Company Name	Levered Beta	Market Capitalization	+ Total Debt including Leases	=Firm Value	-Cash	= Enterprise Value	Cash/Firm Value	Pre-tax cost of debt	Marginal tax rate	Gross D/E ratio	Revenue (Sales)	EV/Sales
SFX Entertainment Inc. (NasdaqGS:SFXE)	1.12	$738.8	$98.9	$837.7	$143.6	$694.1	17.14%	8.46%	40.00%	13.39%	62.0	11.20
Mass Hysteria Entertainment Company, Inc. (OTCPK:MHYS)	1.19	$0.2	$1.1	$1.4	$-	$1.4	0.00%	10.00%	40.00%	477.94%	0	12.45
Medient Studios, Inc. (OTCPK:MDNT)	0.93	$3.2	$3.2	$6.4	$0.1	$6.3	0.81%	4.84%	40.00%	99.07%	5.22	1.21
POW! Entertainment, Inc. (OTCPK:POWN)	0.94	$4.0	$0.3	$4.3	$0.4	$3.9	9.85%	4.00%	40.00%	8.65%	2.03	1.92
MGM Holdings Inc. (OTCPK:MGMB)	1.29	$3,631.7	$142.2	$3,773.9	$140.7	$3,633.2	3.73%	10.00%	40.00%	3.91%	1,892.6	1.92
Lions Gate Entertainment Corp. (NYSE:LGF)	1.20	$4,719.6	$1,283.2	$6,002.8	$67.2	$5,935.6	1.12%	6.34%	40.00%	27.19%	2,597.8	2.28
DreamWorks Animation SKG Inc. (NasdaqGS:DWA)	1.32	$2,730.0	$348.3	$3,078.3	$156.4	$2,921.9	5.08%	3.00%	40.00%	12.76%	767.3	3.81
Twenty-First Century Fox, Inc. (NasdaqGS:FOXA)	1.28	$77,743.5	$20,943.0	$98,686.5	$6,681.0	$92,005.5	6.77%	6.15%	40.00%	26.94%	28,733.0	3.20
Independent Film Development Corporation (OTCPK:IFLM)	1.61	$1.3	$1.0	$2.3	$-	$2.2	2.20%	10.00%	40.00%	72.35%	1	3.37
Odyssey Pictures Corp. (OTCPK:OPIX)	2.60	$0.3	$1.6	$1.9	$0.0	$1.9	0.10%	3.00%	40.00%	551.12%	0.669	2.90
Average	**1.35**						**4.68%**	**6.58%**	**40.00%**	**129.33%**		**4.43**
Aggregate	**1.35**		**$22,822.82**	**$112,395.45**	**$7,189.43**	**$105,206.02**	**6.40%**	**6.58%**	**40.00%**	**25.48%**	**34,061.4**	**3.09**
Median	**1.24**						**2.96%**	**6.24%**	**40.00%**	**27.06%**		**3.05**

BACKING INTO A PURE PLAY BETA: THE MEDIAN MOVIE COMPANY

	Value	Beta		Value	Beta
Movie Business	97.04	1.0993	Debt	21.3	0
Cash Business	2.96	0	Equity	78.7	1.24
Movie Company	100	1.0668			

1. Start with the median regression beta (equity beta) of 1.24
2. Unlever the beta, using the median gross D/E ratio of 27.06%
   Gross D/E ratio = 21.30/78.70 = 27.06%
   Unlevered beta = 1.24/ (1+ (1-.4) (.2706)) = 1.0668
3. Take out the cash effect, using the median cash/value of 2.96%
   (.0296) (0) + (1-.0296) (Beta of movie business) = 1.0668
   Beta of movie business = 1.0668/(1-.0296) = 1.0993

Alternatively, you could have used the net debt to equity ratio

Net D/E ratio = (21.30-2.96)/78.70 = 23.30%
Unlevered beta for movies = 1.24/ (1+(1-.4)(.233)) = 1.0879

DISNEY'S UNLEVERED BETA: OPERATIONS & ENTIRE COMPANY

Disney Operations: Unlevered Beta

Business	Revenues	EV/Sales	Value of Business	Proportion of Disney	Unlevered beta	Value	Proportion
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 – The Company: Unlevered Beta

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.

Business	*Identifiable assets (2013)*	*Proportion of debt*	*Value of business*	*Allocated debt*	*Estimated equity*	*D/E ratio*
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.

Business	*Unlevered beta*	*Value of business*	*D/E ratio*	*Levered beta*	*Cost of Equity*
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%

DISCUSSION ISSUE

- Assume now that you are the CFO of Disney. The head of the movie business has come to you with a new big budget movie that he would like you to fund. He claims that his analysis of the movie indicates that it will generate a return on equity of 9.5%. Would you fund it?
  a. Yes. It is higher than the cost of equity for Disney as a company
  b. No. It is lower than the cost of equity for the movie business.
- What are the broader implications of your choice?

ESTIMATING BOTTOM UP BETAS & COSTS OF EQUITY: VALE

Business	*Sample*	*Sample size*	*Unlevered beta of business*	*Revenues*	*Peer Group EV/Sales*	*Value of Business*	*Proportion of Vale*
Metals & Mining	Global firms in metals & mining, Market cap>$1 billion	48	0.86	$9,013	1.97	$17,739	16.65%
Iron Ore	Global firms in iron ore	78	0.83	$32,717	2.48	$81,188	76.20%
Fertilizers	Global specialty chemical firms	693	0.99	$3,777	1.52	$5,741	5.39%
Logistics	Global transportation firms	223	0.75	$1,644	1.14	$1,874	1.76%
Vale Operations			*0.8440*	*$47,151*		*$106,543*	*100.00%*

Business	Unlevered beta	D/E ratio	Levered beta	Risk free rate	ERP	Cost of Equity
Metals & Mining	0.86	54.99%	1.1657	2.75%	7.38%	11.35%
Iron Ore	0.83	54.99%	1.1358	2.75%	7.38%	11.13%
Fertilizers	0.99	54.99%	1.3493	2.75%	7.38%	12.70%
Logistics	0.75	54.99%	1.0222	2.75%	7.38%	10.29%
Vale Operations	0.84	54.99%	1.1503	2.75%	7.38%	11.23%

VALE: COST OF EQUITY CALCULATION – IN NOMINAL $R

- To convert a discount rate in one currency to another, all you need are expected inflation rates in the two currencies.

$$(1+\$\text{ Cost of Equity})\frac{(1+\text{Inflation Rate}_{\text{Brazil}})}{(1+\text{Inflation Rate}_{\text{US}})}-1$$

- **Inflation Differential**: If we use 2% as the inflation rate in US dollars and 9% as the inflation ratio in Brazil, we can convert Vale's US dollar cost of equity of 11.23% to a $R cost of equity:

$$\text{Cost of Equity}_{\text{Nominal R\$}} = (1+\text{ Cost of Equity}_{\text{US \$}})\frac{(1+\text{Expected Inflation}_{\text{R\$}})}{(1+\text{Expected Inflation}_{\text{US \$}})}-1$$

$$= (1.1123)\ \frac{(1.09)}{(1.02)}-1 = 18.87\%$$

- **Riskfree Rate**: Alternatively, you can compute a cost of equity, starting with the $R riskfree rate of 10.18%.
  - Cost of Equity in $R = = 10.18% + 1.15 (7.38%) = 18.67%
  -

BOTTOM UP BETAS & COSTS OF EQUITY: TATA MOTORS & BAIDU

- **Tata Motors**: We estimated an unlevered beta of 0.8601 across 76 publicly traded automotive companies (globally) and estimated a levered beta based on Tata Motor's D/E ratio of 41.41% and a marginal tax rate of 32.45% for India:
  - Levered Beta for Tata Motors = 0.8601 (1 + (1-.3245) (.4141)) = 1.1007
  - Cost of equity for Tata Motors (Rs) = 6.57% + 1.1007 (7.19%) = 14.49%
- **Baidu**: To estimate its beta, we looked at 42 global companies that derive all or most of their revenues from online advertising and estimated an unlevered beta of 1.30 for the business. Incorporating Baidu's current market debt to equity ratio of 5.23% and the marginal tax rate for China of 25%, we estimate Baidu's current levered beta to be 1.3560.
  - Levered Beta for Baidu = 1.30 (1 + (1-.25) (.0523)) = 1.356
  - Cost of Equity for Baidu (Renmimbi) = 3.50% + 1.356 (6.94%) = 12.91%

BOTTOM UP BETAS AND COSTS OF EQUITY: DEUTSCHE BANK

- We break **Deutsche Bank** down into two businesses – commercial and investment banking.

Company	*Largest holder*	*# of institutional investors in top ten holdings*
Disney	Laurene Jobs (7.3%)	8
Deutsche Bank	Blackrock (4.69%)	10
Vale Preferred	Aberdeen (7.40%)	8
Tata Motors	Tata Sons (26.07%)	7
Baidu (A)	Capital Group (12.46%)	10

- We do not unlever or relever betas, because estimating debt and equity for banks is an exercise in futility. Using a riskfree rate of 1.75% (Euro risk free rate) and Deutsche's ERP of 6.12%:

Business	*Beta*	*Cost of Equity*
Commercial banking	1.0665	1.75%+1.0665 (6.12%) = 8.28%
Investment Banking	1.2550	1.75%+1.2550 (6.12%) = 9.44%
Deutsche Bank	1.1516	1.75%+1.1516 (6.12%) = 8.80%

ESTIMATING BETAS FOR NON-TRADED ASSETS

- The regression beta approach of estimating betas from regressions do not work for **assets that are not traded.** There are no stock prices or historical returns that can be used to compute regression betas.
- There are two ways in which betas can be estimated for non-traded assets
  - Using **comparable firms**
  - Using **accounting earnings**

USING COMPARABLE FIRMS TO ESTIMATE BETA FOR BOOKSCAPE

Company Name	*Industry*	*Market Capitalization*	*Levered Beta*	*Marginal tax rate*	*Gross D/E ratio*	*Cash/Firm Value*	R^2
Red Giant Entertainment	Publishing	$2.13	0.69	40.00%	0.00%	0.05%	0.1300
CTM Media Holdings	Publishing	$25.20	1.04	40.00%	17.83%	33.68%	0.1800
Books-A-Million	Book Stores	$38.60	1.42	40.00%	556.55%	4.14%	0.1900
Dex Media	Publishing	$90.50	4.92	40.00%	3190.39%	7.86%	0.2200
Martha Stewart Living	Publishing	$187.70	1.11	40.00%	19.89%	15.86%	0.3500
Barnes & Noble	Book Stores	$939.30	0.11	40.00%	164.54%	3.22%	0.2600
Scholastic Corporation	Publishing	$953.80	1.08	40.00%	21.41%	1.36%	0.2750
John Wiley	Publishing	$2,931.40	0.81	40.00%	29.58%	5.00%	0.3150
Washington Post	Publishing	$4,833.20	0.68	40.00%	21.04%	16.04%	0.2680
News Corporation	Publishing	$10,280.40	0.49	40.00%	8.73%	24.05%	0.2300
Thomson Reuters	Publishing	$31,653.80	0.62	40.00%	26.38%	1.68%	0.2680
Average			**1.1796**	**40.00%**	**368.76%**	**10.27%**	**0.2442**
Median			**0.8130**	**40.00%**	**21.41%**	**5.00%**	**0.2600**

Unlevered beta for book company = 0.8130/ (1+ (1-.4) (.2141)) = 0.7205

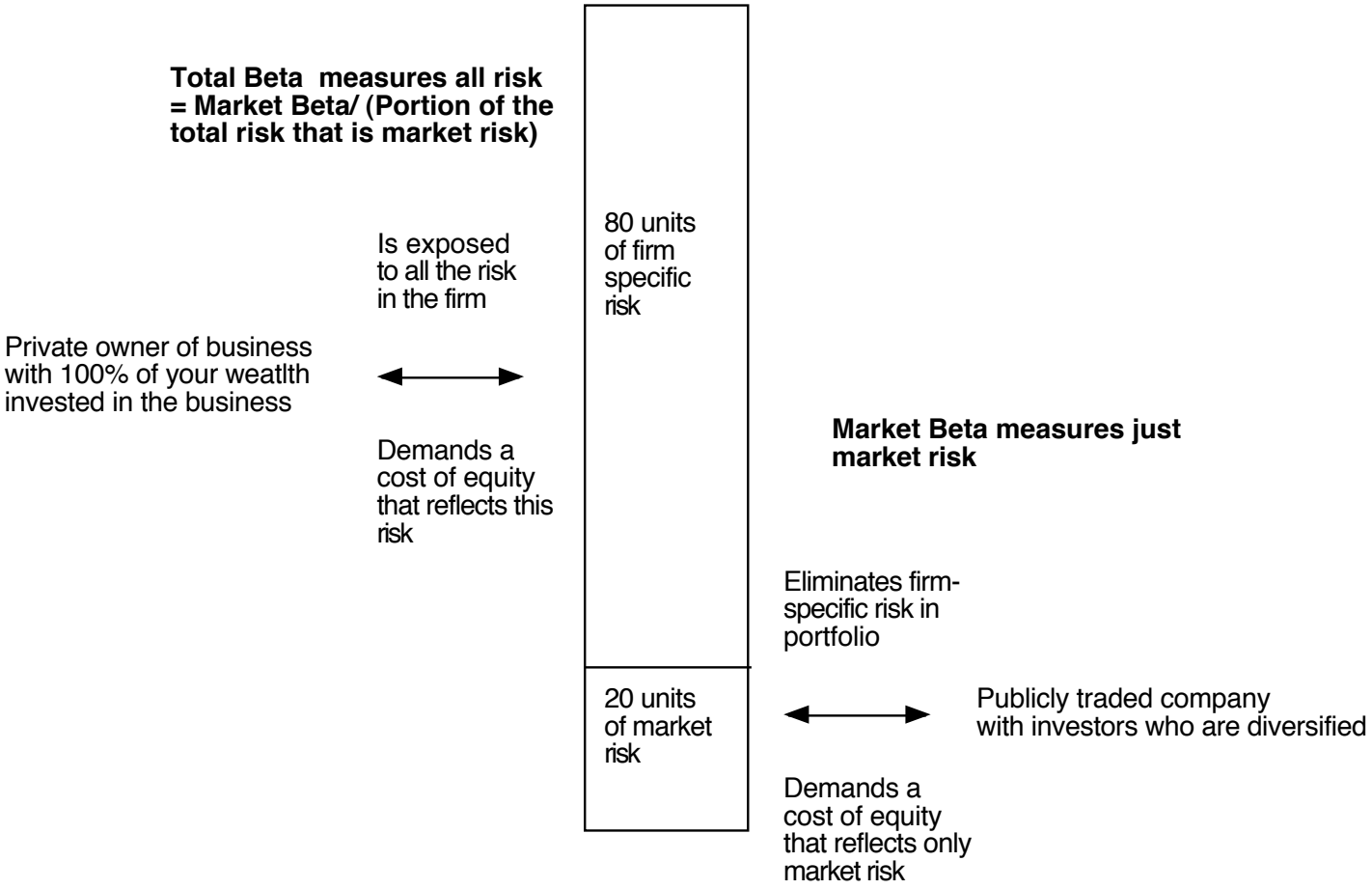
Unlevered beta for book business = 0.7205/(1-.05) = 0.7584

ESTIMATING BOOKSCAPE LEVERED BETA AND COST OF EQUITY

- Because the debt/equity ratios used in computing levered betas are market debt equity ratios, and the only debt equity ratio we can compute for Bookscape is a book value debt equity ratio, we have assumed that Bookscape is **close to the book industry median market debt to equity ratio of 21.41 percent.**
- Using a **marginal tax rate of 40 percent** for Bookscape, we get a levered beta of 0.8558.
  - Levered beta for Bookscape = 0.7584[1 + (1 – 0.40) (0.2141)] = 0.8558
- Using a riskfree rate of 2.75% (US treasury bond rate) and an equity risk premium of 5.5%:
  - Cost of Equity = 2.75%+ 0.8558 (5.5%) = 7.46%

IS BETA AN ADEQUATE MEASURE OF RISK FOR A PRIVATE FIRM?

Private Owner versus Publicly Traded Company Perceptions of Risk in an Investment



TOTAL RISK VERSUS MARKET RISK

- **Adjust the beta to reflect total risk rather than market risk.** This adjustment is a relatively simple one, since the R squared of the regression measures the proportion of the risk that is market risk.
  - Total Beta = Market Beta / Correlation of the sector with the market
- In the Bookscape example, where the market beta is 0.8558 and the median R-squared of the comparable publicly traded firms is 26.00%; the correlation with the market is 50.99%.

$$\frac{\text{Market Beta}}{\sqrt{\text{R squared}}} = \frac{0.8558}{.5099} = 1.6783$$

  - Total Cost of Equity = 2.75 + 1.6783 (5.5%) = 11.98%
- Note that the **market beta and the correlation come from publicly traded companies** in this space.

APPLICATION TEST: ESTIMATING A BOTTOM-UP BETA

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

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

FROM COST OF EQUITY TO COST OF CAPITAL

- The cost of capital is a composite cost to the firm of raising financing to fund its projects.
- In addition to equity, firms can raise capital from debt.
- To get to a cost of capital, you need to
  - Estimate a cost of debt
  - Estimate weights for debt and equity

WHAT IS DEBT?

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

ESTIMATING THE COST OF DEBT

- If the firm has bonds outstanding, and the bonds are traded, **the yield to maturity on a long-term, straight (no special features) bond** can be used as the interest rate.
- If the **firm is rated**, use the **rating and a typical default spread** on bonds with that rating to estimate the cost of debt.
- If the firm is not rated,
  - and it has **recently borrowed long term from a ba**nk, 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.

THE EASY ROUTE: OUTSOURCING THE MEASUREMENT OF DEFAULT RISK

- For those firms that have bond ratings from global ratings agencies, I used those ratings:

Company	S&P Rating	Risk-Free Rate	Default Spread	Cost of Debt
Disney	A	2.75% (US $)	1.00%	3.75%
Deutsche Bank	A	1.75% (Euros)	1.00%	2.75%
Vale	A-	2.75% (US $)	1.30%	4.05%

- If you want to estimate Vale's cost of debt in $R terms, we can again use the differential inflation approach we used for the cost of equity:

$$\text{Cost of debt}_{R\$} = (1+ \text{Cost of debt}_{US\ \$}) \frac{(1+\text{Expected Inflation}_{R\$})}{(1+\text{Expected Inflation}_{US\ \$})} - 1$$

$$= (1.0405)\ \ (1.09/1.02)\ -1\ \ = 11.19\%$$

A MORE GENERAL ROUTE: ESTIMATING SYNTHETIC RATINGS

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

Interest Coverage Ratio = EBIT / Interest Expenses

- For the non-financial service companies, we obtain the following:

Company	Operating income	Interest Expense	Interest coverage ratio
Disney	$10.023	$444	22.57
Vale	$15,667	$1,342	11.67
Tata Motors	Rs 166,605	Rs 36,972	4.51
Baidu	CY 11,193	CY 472	23.72
Bookscape	$2,536	$492	5.16

INTEREST COVERAGE RATIOS, RATINGS AND DEFAULT SPREADS- NOVEMBER 2013

Large cap (>$5 billion)	*Small cap or risky (<$5 billion)*	*Rating is (S&P/ Moody's)*	*Spread (11/13)*
>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
Vale: Large cap, emerging	11.67	→	AA
Tata Motors: Large cap, Emerging	4.51	→	A-
Baidu: Small cap, Emerging	23.72	→	AAA
Bookscape: Small cap, private	5.16	→	A-

SYNTHETIC VERSUS ACTUAL RATINGS: RATED FIRMS

- **Disney's synthetic rating is AAA**, whereas its **actual rating is A.** The difference can be attributed to any of the following:
  - Synthetic ratings reflect only the interest coverage ratio whereas actual ratings incorporate all of the other ratios and qualitative factors
  - Synthetic ratings do not allow for sector-wide biases in ratings
  - Synthetic rating was based on 2013 operating income whereas actual rating reflects normalized earnings
- **Vale's synthetic rating is AA, but the actual rating for dollar debt is A-.** The biggest factor behind the difference is the presence of country risk, since Vale is probably being rated lower for being a Brazil-based corporation.
- **Deutsche Bank had an A rating.** We will not try to estimate a synthetic rating for the bank. Defining interest expenses on debt for a bank is difficult…

ESTIMATING COST OF DEBT

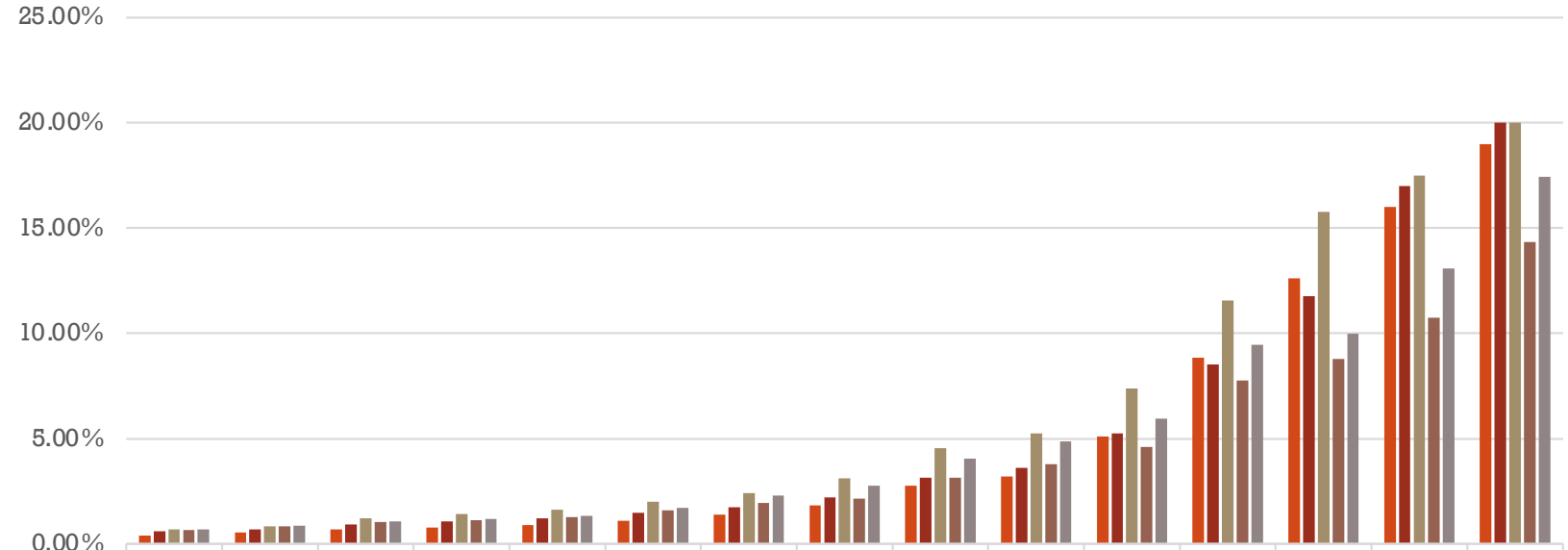
- For Bookscape, we will use the synthetic rating (A-) to estimate the cost of debt:
  - Default Spread based upon A- rating = 1.30%
  - Pre-tax cost of debt = Riskfree Rate + Default Spread = 2.75% + 1.30% = 4.05%
  - After-tax cost of debt = Pre-tax cost of debt (1- tax rate) = 4.05% (1-.40) = 2.43%
- For the three publicly traded firms that are rated in our sample, we will use the actual bond ratings to estimate the costs of debt.

Company	S&P Rating	Risk-Free Rate	Default Spread	Cost of Debt	Tax Rate	After-Tax Cost of Debt
Disney	A	2.75% (US $)	1.00%	3.75%	36.1%	2.40%
Deutsche Bank	A	1.75% (Euros)	1.00%	2.75%	29.48%	1.94%
Vale	A-	2.75% (US $)	1.30%	4.05%	34%	2.67%

- For Tata Motors, we have a rating of AA- from CRISIL, an Indian bond-rating firm, that measures only company risk. Using that rating:
  - Cost of debt$_{TMT}$ = Risk free rate$_{Rupees}$ + Default spread$_{India}$ + Default spread$_{TMT}$
  - = 6.57% + 2.25% + 0.70% = 9.62%
  - After-tax cost of debt = 9.62% (1-.3245) = 6.50%

DEFAULT SPREADS – JANUARY 2026

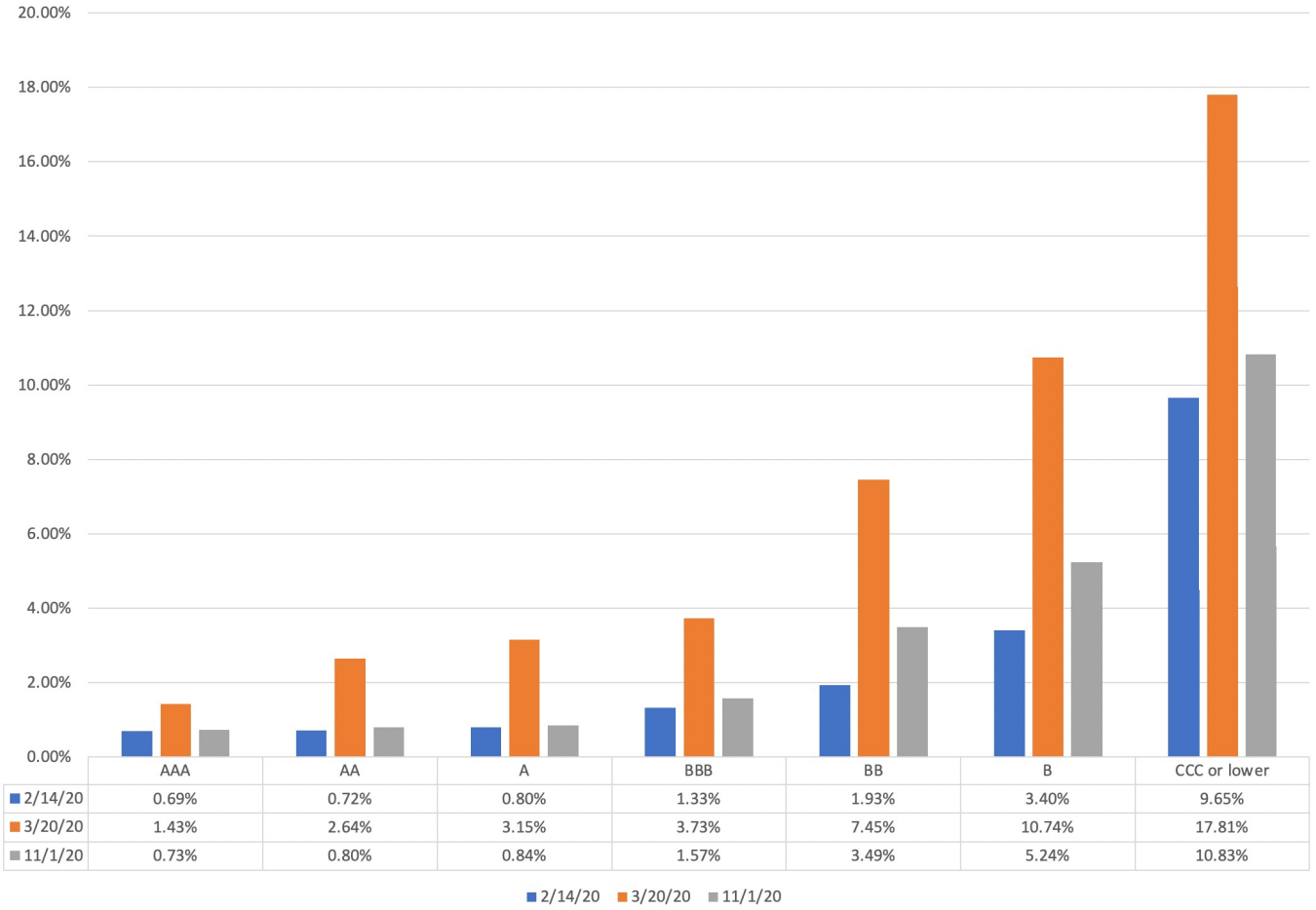
Corporate Bond Default Spreads on January 1, 2026



	Aaa/AAA	Aa2/AA	A1/A+	A2/A	A3/A-	Baa2/BBB	Ba1/BB+	Ba2/BB	B1/B+	B2/B	B3/B-	Caa/CCC	Ca2/CC	C2/C	D2/D
Spread 2025	0.40%	0.55%	0.70%	0.78%	0.89%	1.11%	1.38%	1.84%	2.75%	3.21%	5.09%	8.85%	12.61%	16.00%	19.00%
Spread 2024	0.59%	0.70%	0.92%	1.07%	1.21%	1.47%	1.74%	2.21%	3.14%	3.61%	5.24%	8.51%	11.78%	17.00%	20.00%
Spread 2023	0.69%	0.85%	1.23%	1.42%	1.62%	2.00%	2.42%	3.13%	4.55%	5.26%	7.37%	11.57%	15.78%	17.50%	20.00%
Spread 2022	0.67%	0.82%	1.03%	1.14%	1.29%	1.59%	1.93%	2.15%	3.15%	3.78%	4.62%	7.78%	8.80%	10.76%	14.34%
Spread 2021	0.69%	0.85%	1.07%	1.18%	1.33%	1.71%	2.31%	2.77%	4.05%	4.86%	5.94%	9.46%	9.97%	13.09%	17.44%

BUT SOME YEARS ARE VOLATILE: 2020 AS A CASE STUDY..

Corporate Bond Default Spreads: 2/14 - 11/1



	AAA	AA	A	BBB	BB	B	CCC or lower
2/14/20	0.69%	0.72%	0.80%	1.33%	1.93%	3.40%	9.65%
3/20/20	1.43%	2.64%	3.15%	3.73%	7.45%	10.74%	17.81%
11/1/20	0.73%	0.80%	0.84%	1.57%	3.49%	5.24%	10.83%

APPLICATION TEST: ESTIMATING A COST OF DEBT

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

COSTS OF HYBRIDS

- **Preferred stock** shares some of the characteristics of debt - the preferred dividend is pre-specified at the time of the issue and is paid out before common dividend -- and some of the characteristics of equity - the payments of preferred dividend are not tax deductible. If preferred stock is viewed as perpetual, the cost of preferred stock can be written as follows:
  - k_{ps} = Preferred Dividend per share/ Market Price per preferred share
- **Convertible debt** is part debt (the bond part) and part equity (the conversion option). It is best to break it up into its component parts and eliminate it from the mix altogether.

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.

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

The debt in this table does not add up to the book value of debt, because Disney does not break down the maturity of all of its debt.

- 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 = $$349\left[\frac{\left(1-\frac{1}{(1.0375)^{7.92}}\right)}{.0375}\right]+\frac{14,288}{(1.0375)^{7.92}}=\$13,028 \text{ million}$$

PV of annuity of $349 million for 7.92 years

PV of face value of $14,288 million in 7.92 years

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

ACCOUNTING COMES TO ITS SENSES ON OPERATING LEASES

- In 2019, **both IFRS and GAAP made a major shift on operating leases**, requiring companies to capitalize leases and show the resulting debt (and counter asset) on the balance sheets.
- That said, the accounting rules for capitalizing leases are far more complex than the simple calculations that I have used, for two reasons:
  - Accounting has to bala**nce its desire to do the right thing with maintaining some connection to its legacy rules.**
  - Companies have **lobbied to modify rules** in their sectors to cushion the impact.

APPLICATION TEST: ESTIMATING MARKET VALUE

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

CURRENT COST OF CAPITAL: DISNEY

- Equity
  - Cost of Equity = Riskfree rate + Beta * Risk Premium
    = 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%



121,878/ (121,878+15,961)

DIVISIONAL COSTS OF CAPITAL: DISNEY AND VALE

- 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%

- Vale

Business	*Cost of equity*	*After-tax cost of debt*	*Debt ratio*	*Cost of capital (in US$)*	*Cost of capital (in $R)*
Metals & Mining	11.35%	2.67%	35.48%	8.27%	15.70%
Iron Ore	11.13%	2.67%	35.48%	8.13%	15.55%
Fertilizers	12.70%	2.67%	35.48%	9.14%	16.63%
Logistics	10.29%	2.67%	35.48%	7.59%	14.97%
Vale Operations	11.23%	2.67%	35.48%	8.20%	15.62%

COSTS OF CAPITAL: TATA MOTORS, BAIDU AND BOOKSCAPE

- To estimate the costs of capital for Tata Motors in Indian rupees:
  - Cost of capital= 14.49% (1-.2928) + 6.50% (.2928) = 12.15%
- For Baidu, we follow the same path to estimate a cost of equity in Chinese RMB:
  - Cost of capital = 12.91% (1-.0523) + 3.45% (.0523) = 12.42%
- For Bookscape, the cost of capital is different depending on whether you look at market or total beta:

	Cost of equity	Pre-tax Cost of debt	After-tax cost of debt	D/(D+E)	Cost of capital
Market Beta	7.46%	4.05%	2.43%	17.63%	6.57%
Total Beta	11.98%	4.05%	2.43%	17.63%	10.30%

APPLICATION TEST: ESTIMATING COST OF CAPITAL

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

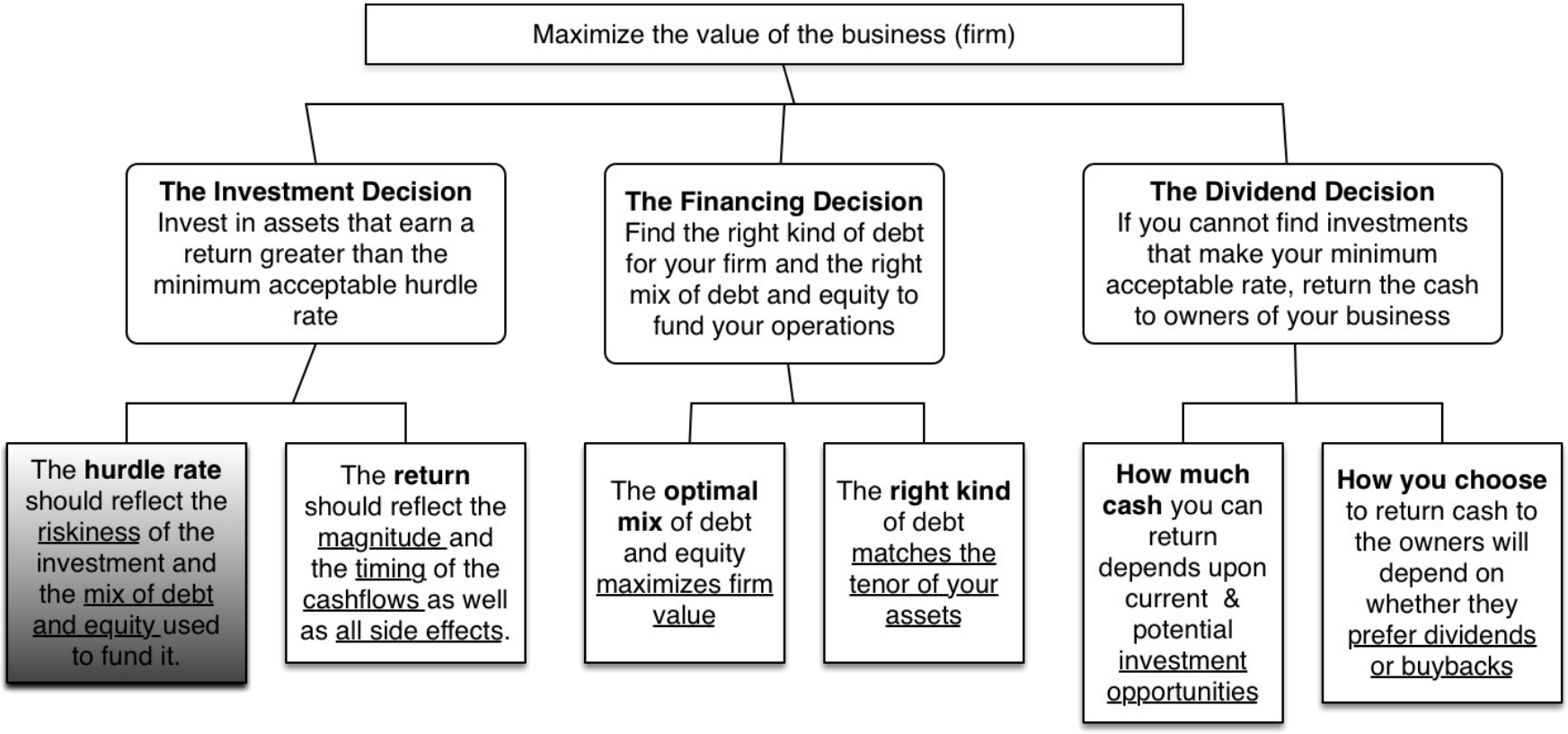
- Based upon the costs of equity and debt that you have estimated, and the weights for each, estimate the cost of capital for your firm.

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

CHOOSING A HURDLE RATE

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

BACK TO FIRST PRINCIPLES



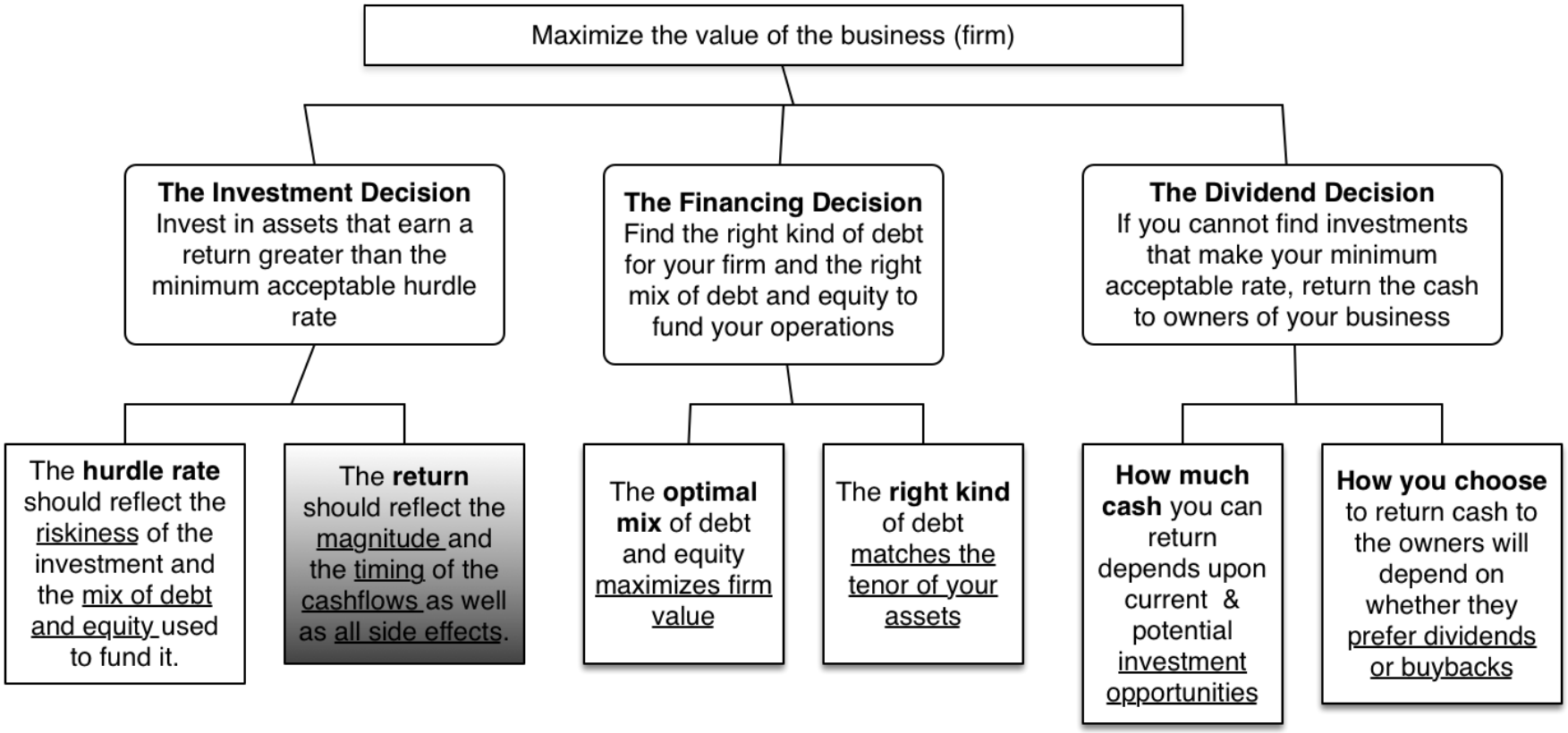
MEASURING INVESTMENT RETURNS I: THE MECHANICS OF INVESTMENT ANALYSIS

"Show me the money"

From Jerry Maguire

Aswath Damodaran

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)
  - subtract out cash outflows which are not expensed (such as capital expenditures)
  - 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"

SETTING THE TABLE: WHAT IS AN INVESTMENT/PROJECT?

- An investment/project can range the spectrum from big to small, money making to cost saving:
  - **Major strategic decisions** to enter new areas of business or new markets.
  - **Acquisitions of other firms** are projects as well, notwithstanding attempts to create separate sets of rules for them.
  - **Decisions on new ventures** within existing businesses or markets.
  - **Decisions that may change the way existing ventures** and projects are run.
  - **Decisions on how best to deliver a service** that is necessary for the business to run smoothly.
- Put in broader terms, every choice made by a firm can be framed as an investment.

HERE ARE FIVE EXAMPLES...

- At Disney,
  - **Rio Disney**: Consider whether Disney should invest in its first theme parks in South America. These parks will require us to consider the effects of country risk and currency issues in project analysis.
  - **A New Show for Disney Plus**: An exercise where estimating the benefits is difficult to do, since it is in the form of keeping existing subscribers or adding new ones
- **New iron ore mine for Vale**: This is an iron ore mine that Vale is considering in Western Labrador, Canada.
- **An Online Store for Bookscape**: Bookscape is evaluating whether it should create an online store to sell books. While it is an extension of their basis business, it will require different investments (and potentially expose them to different types of risk).
- **Acquisition of Harman by Tata Motors**: A cross-border bid by Tata for Harman International, a publicly traded US firm that manufactures high-end audio equipment, with the intent of upgrading the audio upgrades on Tata Motors' automobiles. This investment will allow us to examine currency and risk issues in such a transaction.

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
  - 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.

KEY REVENUE ASSUMPTIONS

- Revenue estimates for the parks and resort properties (in millions)

Year	*Magic Kingdom*	*Epcot II*	*Resort Properties*	*Total*
1	$0	$0	$0	$0
2	$1,000	$0	$250	$1,250
3	$1,400	$0	$350	$1.750
4	$1,700	$300	$500	$2.500
5	$2,000	$500	$625	$3.125
6	$2,200	$550	$688	$3,438
7	$2,420	$605	$756	$3,781
8	$2,662	$666	$832	$4,159
9	$2,928	$732	$915	$4,575
10	$2,987	$747	$933	$4,667

KEY EXPENSE ASSUMPTIONS

- The operating expenses are assumed to be **60% of the revenues** at the parks, and **75% of revenues** at the resort properties.
- Disney will also allocate corporate general and administrative costs to this project, based upon revenues
  - The **G&A allocation will be 15% of the revenues** each year.
  - It is worth noting that a recent analysis of these expenses found that **only one-third of these expenses are variable** (and a function of total revenue) and that two-thirds are fixed.

DEPRECIATION AND CAPITAL MAINTENANCE

Year	*Depreciation as % of Book Value*	*Capital Maintenance as % of Depreciation*
1	0.00%	0.00%
2	12.50%	50.00%
3	11.00%	60.00%
4	9.50%	70.00%
5	8.00%	80.00%
6	8.00%	90.00%
7	8.00%	100.00%
8	8.00%	105.00%
9	8.00%	110.00%
10	8.00%	110.00%

- The capital maintenance expenditures are low in the early years, when the parks are still new but increase as the parks age.

OTHER ASSUMPTIONS

- Disney will have to maintain non-cash working capital (primarily consisting of inventory at the theme parks and the resort properties, netted against accounts payable) of **5% of revenues**, with the investments being made at the end of each year.
- The income from the investment will be taxed at Disney's **marginal tax rate of 36.1%.**

LAYING THE GROUNDWORK: BOOK CAPITAL, WORKING CAPITAL AND DEPRECIATION

	0	1	2	3	4	5	6	7	8	9	10
Book Value of Pre-project inv	*$500*	*$450*	*$400*	*$350*	*$300*	*$250*	*$200*	*$150*	*$100*	*$50*	*$0*
Depreciation: Pre-Project		$50	$50	$50	$50	$50	$50	$50	$50	$50	$50
Magic Kingdom	$2,000	$1,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Epcot Rio	$0	$0	$1,000	$500	$0	$0	$0	$0	$0	$0	$0
Capital Maintenance		$0	$188	$252	$276	$258	$285	$314	$330	$347	$350
- Depreciation on fixed assets		$0	$375	$419	$394	$322	$317	$314	$314	$316	$318
Book Value of new Fixed Assets	*$2,000*	*$3,000*	*$3,813*	*$4,145*	*$4,027*	*$3,962*	*$3,931*	*$3,931*	*$3,946*	*$3,978*	*$4,010*
Book Value of Working Capital			$63	$88	$125	$156	$172	$189	$208	$229	$233
Total Capital Invested in Project	$2,500	$3,450	$4,275	$4,582	$4,452	$4,368	$4,302	$4,270	$4,254	$4,257	$4,243

12.5% of book value at end of prior year ($3,000)

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

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

WHAT SHOULD THIS RETURN BE COMPARED TO?

- The computed return on capital on this investment is about 4.18%. 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 many countries (or)
  - the investors in the company are globally diversified.
  - For Disney, exchange rate 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.
  - 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

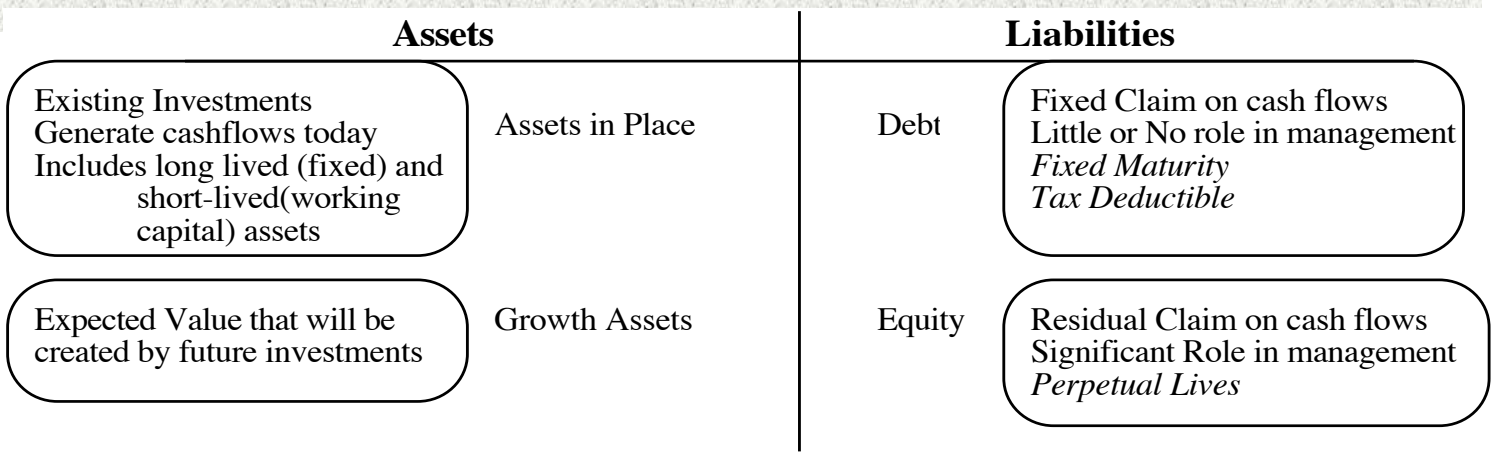
- We **estimated a cost of capital of 6.61%** for the Disney theme park business, using a bottom-up levered beta of 0.7537 for the business.
  - This cost of equity may not adequately reflect the additional risk associated with the theme park being in an emerging market.
  - The concern we would have 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?
  a. Yes
  b. No

A TANGENT: FROM NEW TO EXISTING INVESTMENTS: ROC FOR THE ENTIRE FIRM

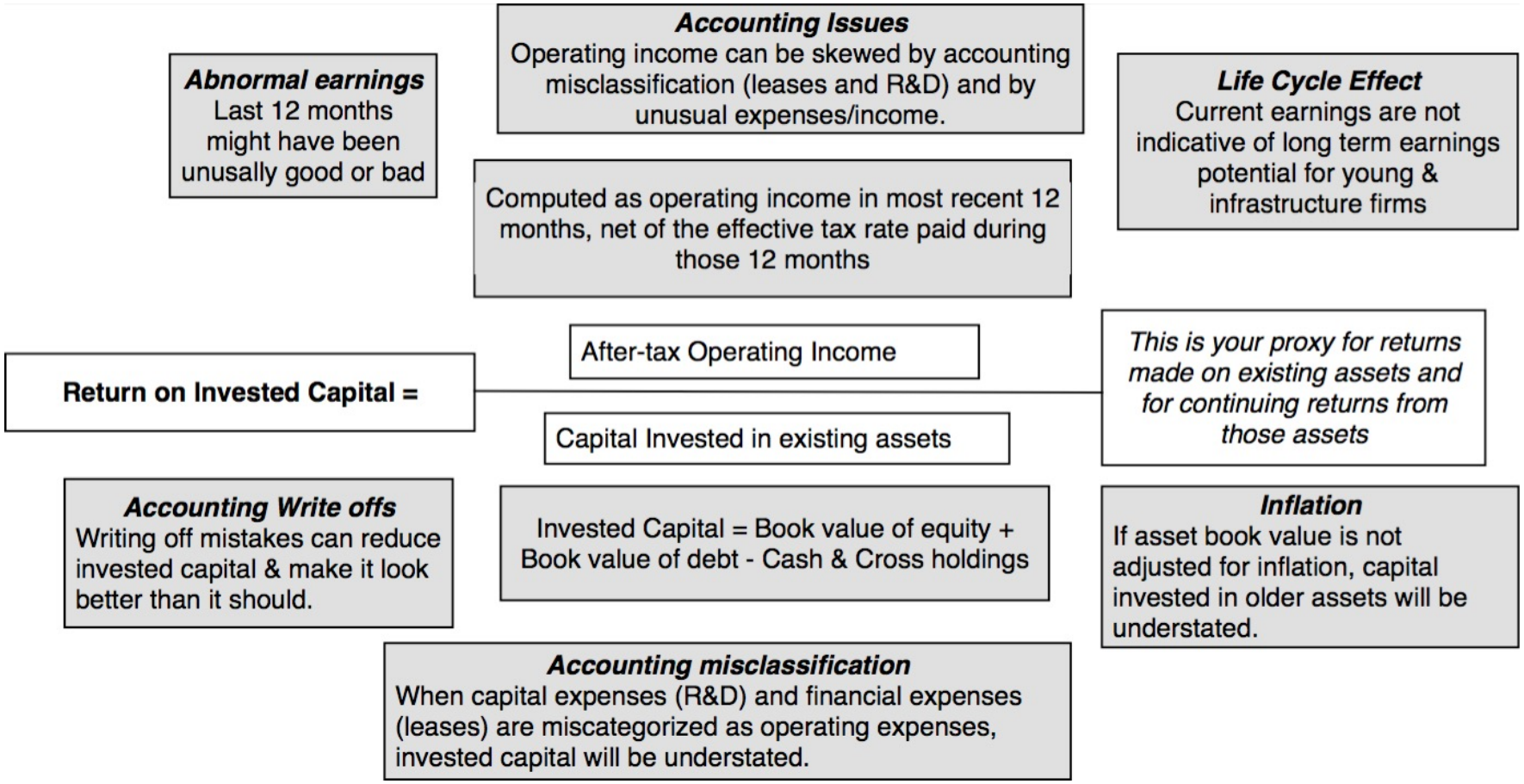
How "good" are the existing investments of the firm?



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%
Vale	$12,432	$49,246	$75,974	$5,818	$119,402	10.41%	8.20%	2.22%
Baidu	¥9,111	¥13,561	¥27,215	¥10,456	¥30,320	30.05%	12.42%	17.63%
Tata Motors	120,905₹	471,489₹	330,056₹	225,562₹	575,983₹	20.99%	11.44%	9.55%
Bookscape	$1,775	$12,136	$8,250	$1,250	$19,136	9.28%	10.30%	-1.02%

THE RETURN ON CAPITAL IS AN ACCOUNTING NUMBER, THOUGH, AND THAT SHOULD SCARE YOU.



RETURN SPREADS GLOBALLY....

Sub Region	# firms	ROE	Cost of equity	% of companies with ROE>COE	% of companies with ROE - COE>5%	ROIC	Cost of capital	% of companies with ROIC>WACC	% of companies with ROIC - WACC>5%
Africa and Middle Eas	1,958	9.71%	10.82%	41.01%	29.83%	7.84%	9.23%	41.22%	28.14%
Australia & NZ	1,559	-14.19%	8.71%	17.25%	11.87%	-11.33%	8.67%	19.37%	12.51%
Canada	2,392	-17.86%	8.83%	12.12%	8.32%	-12.29%	8.68%	13.21%	7.94%
China	7,451	3.26%	10.08%	20.91%	10.56%	2.69%	8.96%	23.51%	13.64%
EU & Environs	4,951	4.43%	9.66%	29.69%	20.54%	4.94%	8.57%	33.04%	23.09%
Eastern Europe & Rus	372	4.84%	10.08%	24.46%	17.74%	3.68%	9.30%	19.35%	12.37%
India	4,520	8.73%	11.02%	36.42%	24.85%	7.07%	9.52%	35.22%	22.85%
Japan	3,760	8.13%	9.80%	39.57%	21.49%	7.74%	8.35%	45.19%	29.15%
Latin America & Carib	807	7.68%	11.62%	32.09%	21.07%	7.75%	9.05%	39.53%	24.41%
Small Asia	9,503	4.78%	10.82%	25.34%	15.44%	3.86%	9.15%	26.09%	15.67%
UK	835	3.72%	9.74%	28.62%	19.16%	5.50%	8.42%	34.85%	24.67%
United States	4,770	-0.20%	9.24%	22.12%	16.06%	3.41%	8.38%	26.62%	18.66%
Global	**42,878**	**4.70%**	**9.93%**	**27.00%**	**17.10%**	**4.28%**	**8.78%**	**29.23%**	**18.78%**

APPLICATION TEST: ASSESSING INVESTMENT QUALITY

- For the most recent period for which you have data, compute the after-tax return on capital earned by your firm, where after-tax return on capital is computed to be
  - After-tax ROC = EBIT (1-tax rate)/ (BV of debt + BV of Equity-Cash)previous year
- For the most recent period for which you have data, compute the return spread earned by your firm:
  - Return Spread = After-tax ROC - Cost of Capital
- Follow up by
  - Examining the reasons why your company earns the excess return (positive or negative) that it does
  - Evaluating whether the company will continue to earn similar excess returns in the future

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 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**

To get from income to cash flow, we

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

II. subtracted out the capital expenditures

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

THE DEPRECIATION TAX BENEFIT

- While depreciation reduces taxable income and taxes, it is a non-cash expense. The benefit of depreciation is therefore the tax benefit. In general, the tax benefit from depreciation can be written as:
  - Tax Benefit = Depreciation * Tax Rate
- Disney Theme Park: Depreciation tax savings (Tax rate = 36.1%)

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

- **Proposition 1**: The tax benefit from depreciation and other non-cash charges is greater, the higher your tax rate.
- **Proposition 2**: Non-cash charges that are not tax deductible (such as amortization of goodwill) and thus provide no tax benefits have no effect on cash flows.

DEPRECIATION METHODS

- Broadly categorizing, depreciation methods can be classified as straight line or accelerated methods. In straight line depreciation, the capital expense is spread evenly over time, In accelerated depreciation, the capital expense is depreciated more in earlier years and less in later years.
- Assume that you made a large investment this year, and that you are choosing between straight line and accelerated depreciation methods. Which will result in higher net income this year?
  a. Straight Line Depreciation
  b. Accelerated Depreciation
- Which will result in higher cash flows this year?
  a. Straight Line Depreciation
  b. Accelerated Depreciation

THE CAPITAL EXPENDITURES EFFECT

- Capital expenditures are not treated as accounting expenses but they are cash outflows.
- Capital expenditures can generally be categorized into two groups
  - **New (or Growth) capital expenditures** are capital expenditures designed to create new assets and future growth
  - **Maintenance capital expenditures** refer to capital expenditures designed to keep existing assets.
  - Both initial and maintenance capital expenditures reduce cash flows
- The **need for maintenance capital expenditures will increase with the life of the project.** In other words, a 25-year project will require more maintenance capital expenditures than a 2-year project.

TO CAP EX OR NOT TO CAP EX?

- Assume that you run a movie/TV streaming business, and that you have an expense this year of $ 100 million from acquiring new subscribers, by offering them special deals and free access. Your accountant tells you that you can expense this item or capitalize and depreciate it over three years. Which will have a more positive effect on income?
  a. Expense it
  b. Capitalize and Depreciate it
- Which will have a more positive effect on cash flows?
  a. Expense it
  b. Capitalize and Depreciate it

THE WORKING CAPITAL EFFECT

- Intuitively, money invested in inventory or in accounts receivable cannot be used elsewhere. It, thus, represents a drain on cash flows
- To the degree that some of these investments can be financed using supplier credit (accounts payable), the cash flow drain is reduced.
- Investments in working capital are thus cash outflows
  - Any increase in working capital reduces cash flows in that year
  - Any decrease in working capital increases cash flows in that year
- To provide closure, working capital investments need to be salvaged at the end of the project life.
- **Proposition 1**: The failure to consider working capital in a capital budgeting project will overstate cash flows on that project and make it look more attractive than it really is.
- **Proposition 2**: Other things held equal, a reduction in working capital requirements will increase the cash flows on all projects for a firm.

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%

A MORE DIRECT WAY OF GETTING TO INCREMENTAL CASH FLOWS

	0	1	2	3	4	5	6	7	8	9	10
Revenues		$0	$1,250	$1,750	$2,500	$3,125	$3,438	$3,781	$4,159	$4,575	$4,667
Direct Expenses		$0	$788	$1,103	$1,575	$1,969	$2,166	$2,382	$2,620	$2,882	$2,940
Incremental Depreciation		$0	$375	$419	$394	$322	$317	$314	$314	$316	$318
Incremental G&A		$0	$63	$88	$125	$156	$172	$189	$208	$229	$233
Incremental Operating Income		$0	$25	$141	$406	$678	$783	$896	$1,017	$1,148	$1,175
- Taxes		$0	$9	$51	$147	$245	$283	$323	$367	$415	$424
Incremental after-tax Operating income		$0	$16	$90	$260	$433	$500	$572	$650	$734	$751
+ Incremental Depreciation		$0	$375	$419	$394	$322	$317	$314	$314	$316	$318
- Capital Expenditures	$2,000	$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	**($2,000)**	**($1,000)**	**($859)**	**($267)**	**$340**	**$466**	**$516**	**$555**	**$615**	**$681**	**$715**

SUNK COSTS

- **What is a sunk cost?** Any expenditure that has already been incurred and cannot be recovered (even if a project is rejected) is called a sunk cost.
  - A test market for a consumer product and R&D expenses for a drug (for a pharmaceutical company) would be good examples.
- **The sunk cost rule**: When analyzing a project, sunk costs should not be considered since they are not incremental.
- **A Behavioral Aside**: It is a well-established finding in psychological and behavioral research that managers find it almost impossible to ignore sunk costs.

TEST MARKETING AND R&D: THE QUANDARY OF SUNK COSTS

- A consumer product company has spent $ 100 million on test marketing. Looking at only the incremental cash flows (and ignoring the test marketing), the project looks like it will create $25 million in value for the company. Should it take the investment?
  a. Yes
  b. No
- Now assume that every investment that this company has shares the same characteristics (Sunk costs > Value Added). The firm will clearly not be able to survive. What is the solution to this problem?

ALLOCATED COSTS

- Firms allocate costs to individual projects from a centralized pool (such as general and administrative expenses) based upon some characteristic of the project (sales is a common choice, as is earnings)
  - For large firms, these allocated costs can be significant and result in the rejection of projects
  - To the degree that these costs are not incremental (and would exist anyway), this makes the firm worse off.
- Thus, it is only the incremental component of allocated costs that should show up in project analysis.

BREAKING OUT G&A COSTS INTO FIXED AND VARIABLE COMPONENTS: A SIMPLE EXAMPLE

- Assume that you have a time series of revenues and G&A costs for a company.

Year	Revenues	G&A Costs
1	$1,000	$250
2	$1,200	$270
3	$1,500	$300

  - What percentage of the G&A cost is variable?

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

PRESENT VALUE MECHANICS

- Cash Flow Type Discounting Formula Compounding Formula
- 1. Simple CF CFn / (1+r)n CF0 (1+r)n
- 2. Annuity $A\left[\frac{1 - \frac{1}{(1+r)^n}}{r}\right]$ $A\left[\frac{(1+r)^n - 1}{r}\right]$
- 3. Growing Annuity $A(1+g)\left[\frac{1 - \frac{(1+g)^n}{(1+r)^n}}{r-g}\right]$
- 4. Perpetuity A/r
- 5. Growing Perpetuity Expected Cashflow next year/(r-g)

DISCOUNTED CASH FLOW MEASURES OF RETURN

- **Net Present Value (NPV):** The net present value is the sum of the present values of all cash flows from the project (including initial investment).
  - NPV = Sum of the present values of all cash flows on the project, including the initial investment, with the cash flows being discounted at the appropriate hurdle rate (cost of capital, if cash flow is cash flow to the firm, and cost of equity, if cash flow is to equity investors)
  - Decision Rule: Accept if NPV > 0
- Inte**rnal Rate of Return (IRR):** The internal rate of return is the discount rate that makes the net present value equal zero.
  - It is the percentage rate of return, based upon incremental time-weighted cash flows.
  - Decision Rule: Accept if IRR > hurdle rate

CLOSURE ON CASH FLOWS

- **Salvage Value**: 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 often set equal to book value of fixed assets and working capital
- **Terminal Value**: In a project with an infinite or very long life, we compute cash flows for a reasonable period, and then compute a terminal value for this project, which is the present value of all cash flows that occur after the estimation period ends..
- Assuming the project lasts forever, and that cash flows after year 10 grow 2% (the inflation rate) forever, the present value at the end of year 10 of cash flows after that can be written as:
  - Terminal Value in year 10= CF in year 11/(Cost of Capital - Growth Rate) =715 (1.02) /(.0846-.02) = $ 11,275 million

WHICH YIELDS A NPV OF..

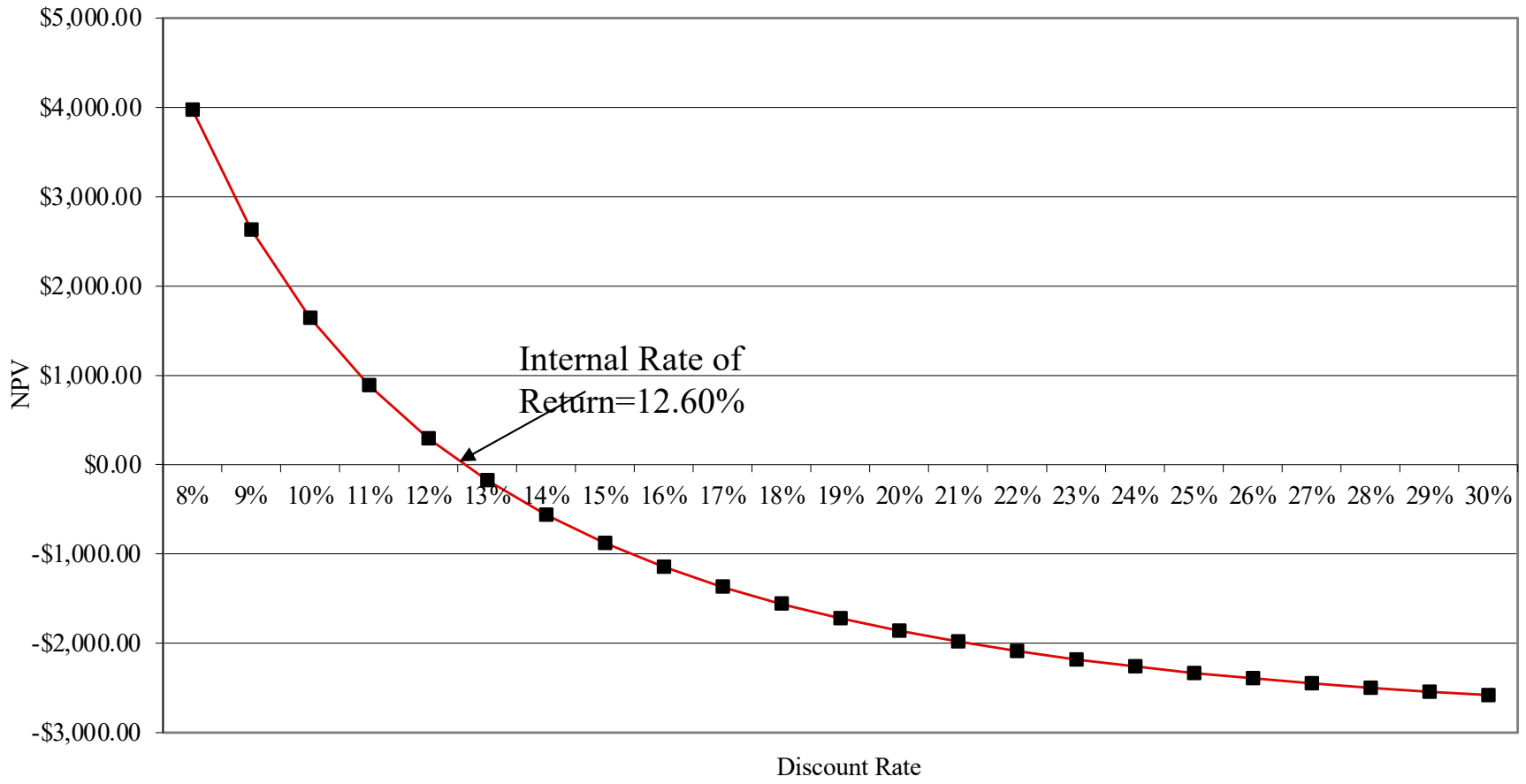
Year	Annual Cashflo	Terminal Value	Present Value
0	-$2,000		-$2,000
1	-$1,000		-$922
2	-$859		-$730
3	-$267		-$210
4	$340		$246
5	$466		$311
6	$516		$317
7	$555		$314
8	$615		$321
9	$681		$328
10	$715	$11,275	$5,321
			$3,296

Discounted at Rio Disney cost of capital of 8.46%

WHICH MAKES THE ARGUMENT THAT..

- The project should be accepted. The positive net present value suggests that the project will add value to the firm and earn a return in excess of the cost of capital.
  - By taking the project, Disney will increase its value as a firm by $3,296 million.
  - Will the market price increase by the same amount? Why or why not?

THE IRR OF THIS PROJECT



THE IRR SUGGESTS..

- **The project is a good one.** Using time-weighted, incremental cash flows, this project provides a return of 12.60%. This is greater than the cost of capital of 8.46%.
- **The IRR and the NPV will yield similar results most of the time,** though there are differences between the two approaches that may cause project rankings to vary depending upon the approach used. They can yield different results, especially why comparing across projects because
  - A project can have **only one NPV**, whereas it can have more than one IRR.
  - The **NPV is a dollar surplus value**, whereas the IRR is a percentage measure of return. The NPV is therefore likely to be larger for "large scale" projects, while the IRR is higher for "small-scale" projects.
  - The NPV assumes that **intermediate cash flows get reinvested at the "hurdle rate"**, which is based upon what you can make on investments of comparable risk, while the IRR assumes that intermediate cash flows get reinvested at the "IRR".

DOES THE CURRENCY MATTER?

- The Rio Disney Theme Park analysis was done in dollars, even though the project will be based in Brazil and will have cash flows primarily in Brazilian Reais.
- Would your assessment of the project have been any different if we had done the analysis in Brazilian Reais?
  a. Yes
  b. No

THE "CONSISTENCY RULE" FOR CASH FLOWS

- The cash flows on a project and the discount rate used should be defined in the same terms.
  - If cash flows are in dollars ($R), the discount rate has to be a dollar ($R) discount rate
  - If the cash flows are nominal (real), the discount rate has to be nominal (real).
- If consistency is maintained, the project conclusions should be identical, no matter what cash flows are used.

DISNEY THEME PARK: PROJECT ANALYSIS IN $R

- The inflation rates were assumed to be 9% in Brazil and 2% in the United States. The $R/dollar rate at the time of the analysis was 2.35 $R/dollar.
- The expected exchange rate was derived assuming purchasing power parity.
  - Expected Exchange Rate$_t$ = Exchange Rate today * $(1.09/1.02)^t$
- The expected growth rate after year 10 is still expected to be the inflation rate, but it is the 9% $R inflation rate.
- The cost of capital in $R was derived from the cost of capital in dollars and the differences in inflation rates:
  - $R Cost of Capital = $(1 + \text{US \$ Cost of Capital}) \frac{(1 + \text{Exp Inflation}_{\text{Brazil}})}{(1 + \text{Exp Inflation}_{\text{US}})} - 1$
  - = (1.0846) (1.09/1.02) – 1 = 15.91%

DISNEY THEME PARK: $R NPV

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 ($R)	Present Value
0	-R$ 2,000.00	R$ 2.35	-R$ 4,700.00	-R$ 4,700.00
1	-R$ 1,000.00	R$ 2.51	-R$ 2,511.27	-R$ 2,166.62
2	-R$ 859.03	R$ 2.68	-R$ 2,305.29	-R$ 1,715.95
3	-R$ 267.39	R$ 2.87	-R$ 766.82	-R$ 492.45
4	R$ 340.22	R$ 3.06	R$ 1,042.63	R$ 577.68
5	R$ 466.33	R$ 3.27	R$ 1,527.21	R$ 730.03
6	R$ 516.42	R$ 3.50	R$ 1,807.31	R$ 745.36
7	R$ 555.08	R$ 3.74	R$ 2,075.89	R$ 738.63
8	R$ 614.95	R$ 4.00	R$ 2,457.65	R$ 754.45
9	R$ 681.46	R$ 4.27	R$ 2,910.36	R$ 770.81
10	R$ 11,989.85	R$ 4.56	R$ 54,719.84	R$ 12,503.50
				R$ 7,745.43

NPV = R$ 7,745/2.35= $ 3,296 Million

NPV is equal to NPV in dollar terms

UNCERTAINTY IN PROJECT ANALYSIS: WHAT CAN WE DO?

- Based on our expected cash flows and the estimated cost of capital, the proposed theme park looks like a very good investment for Disney. Which of the following may affect your assessment of value?
  a. Revenues may be over estimated (crowds may be smaller and spend less)
  b. Actual costs may be higher than estimated costs
  c. Tax rates may go up
  d. Interest rates may rise
  e. Risk premiums and default spreads may increase
  f. All of the above
- How would you respond to this uncertainty?
  a. Will wait for the uncertainty to be resolved
  b. Will not take the investment
  c. Ask someone else (consultant, boss, colleague) to make the decision
  d. Ignore it.
  e. Other

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

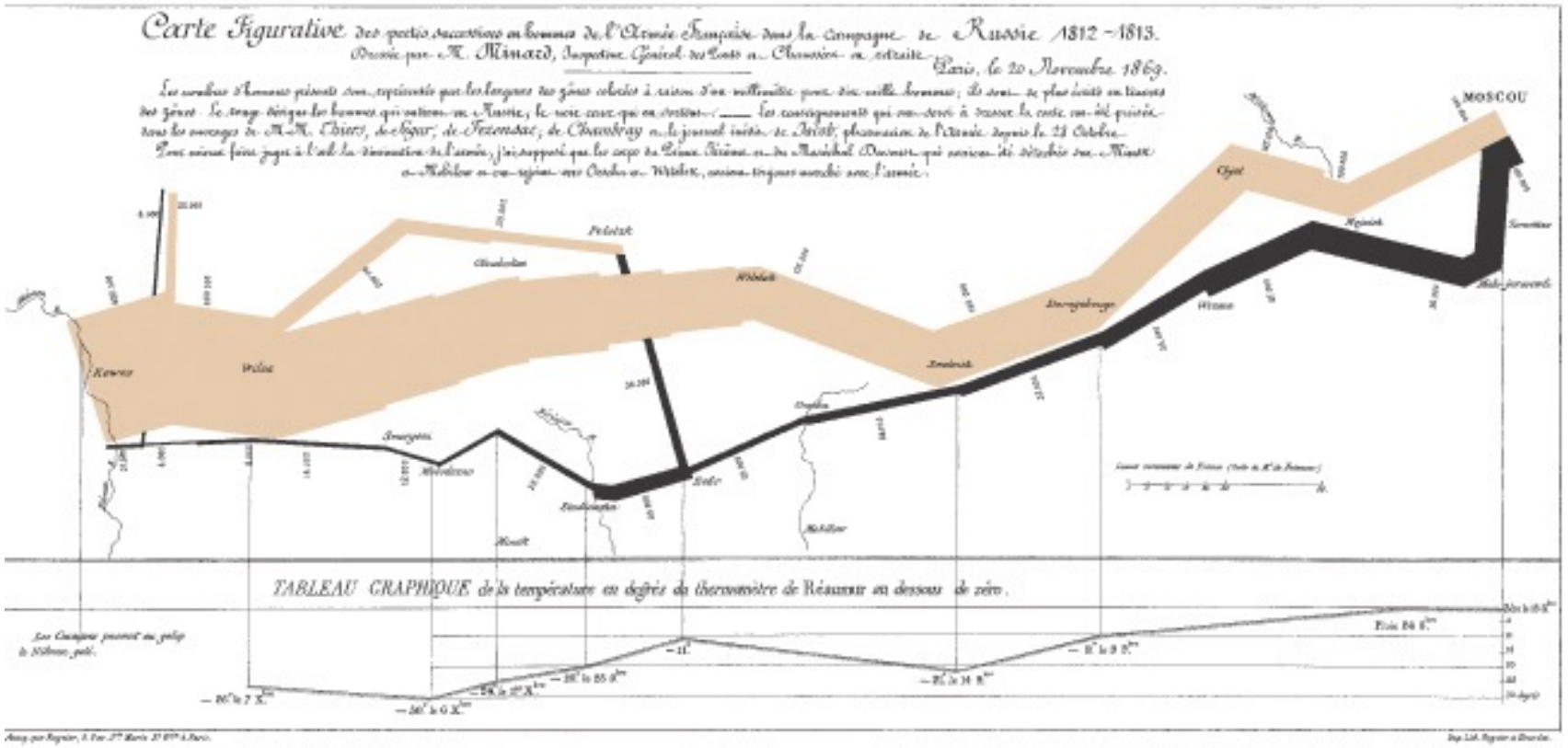
Payback = 10.3 years

Discounted Payback = 16.8 years

A SLIGHTLY MORE SOPHISTICATED APPROACH: SENSITIVITY ANALYSIS & WHAT-IF QUESTIONS...

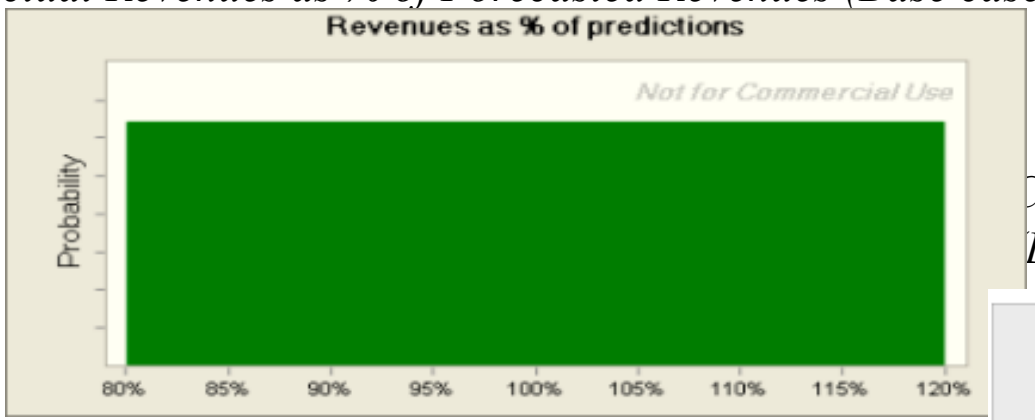
- The NPV, IRR and accounting returns for an investment will change as we change the values that we use for different variables.
- One way of analyzing uncertainty is to check to see how sensitive the decision measure (NPV, IRR..) is to changes in key assumptions. While this has become easier and easier 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...

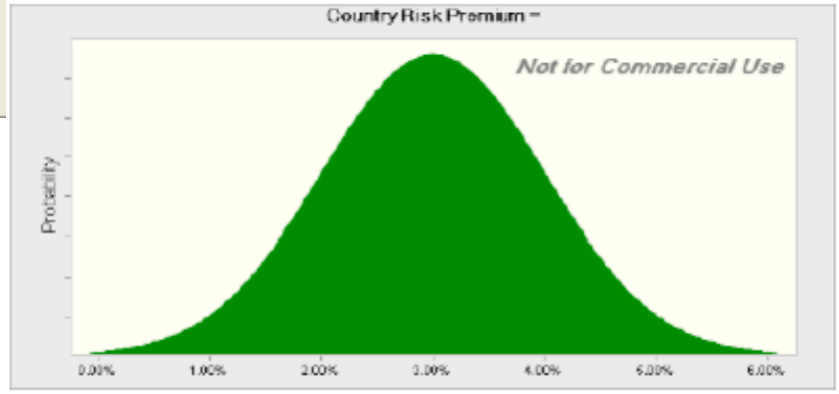


THE FINAL STEP UP: INCORPORATE PROBABILISTIC ESTIMATES.. RATHER THAN EXPECTED VALUES..

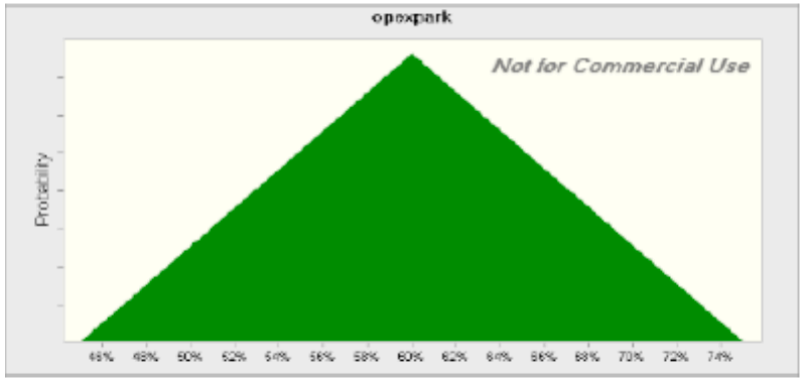
Actual Revenues as % of Forecasted Revenues (Base case = 100%)



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

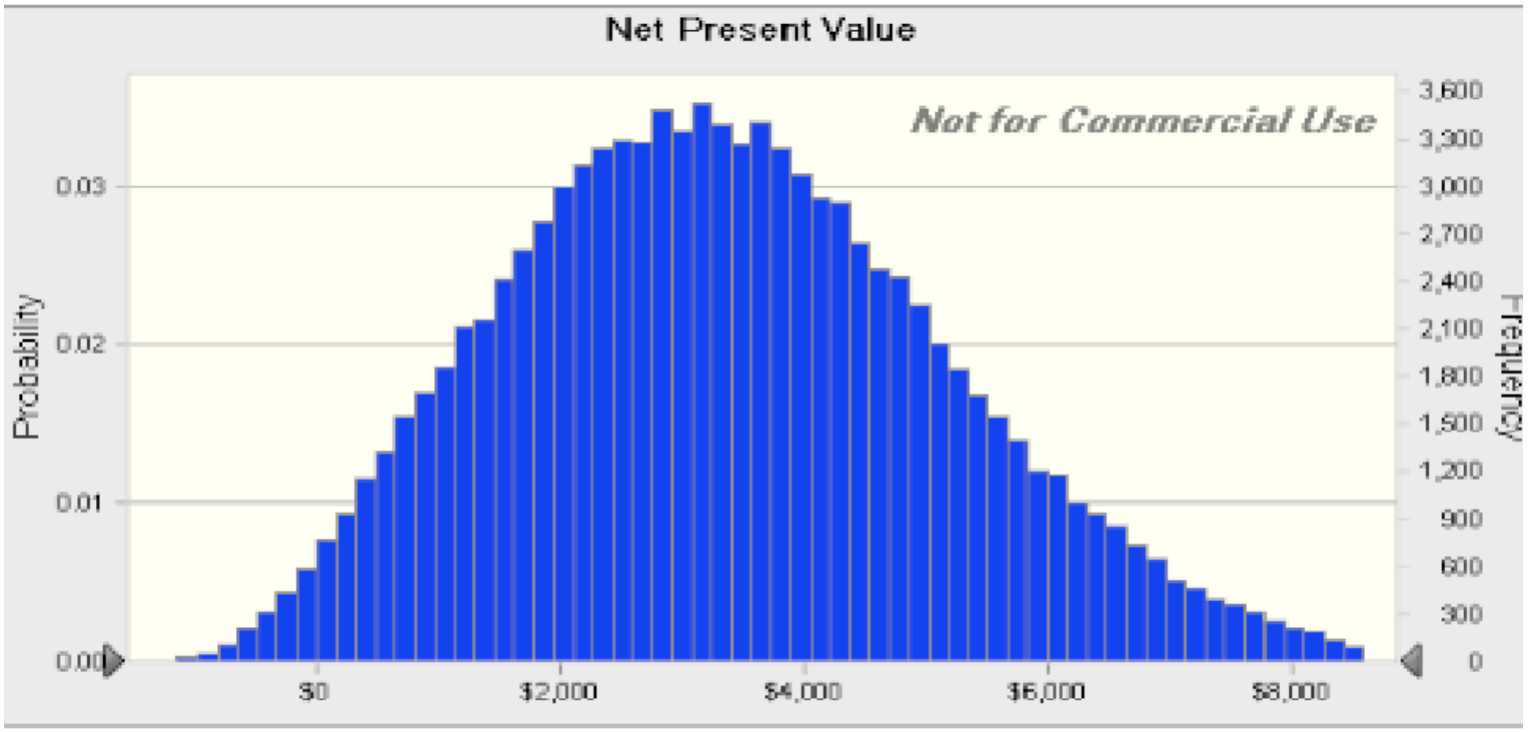


Operating Expenses at Parks as % of Revenues (Base Case = 60%)



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.

YOU ARE THE DECISION MAKER...

- Assume that you are the person at Disney who is given the results of the simulation. **The average and median NPV are close to your base case values of $3.29 billion.**
- However, there is a 12% probability that the project could have a negative NPV and that the NPV could be a large negative value? How would you use this information?
  a. I would accept the investment and print the results of this simulation and file them away to show that I exercised due diligence.
  b. I would reject the investment, because it is too risky (there is a 10% chance that it could be a bad project)
  c. Other

DISNEY+: A STREAMING EXPERIMENT

- In 2020, Disney focused much of its attention and spending on Disney +, its subscription-based competitor to Netflix.
- While the initial selling point for Disney+ was the immense content that Disney controlled, it became very clear early on (with the Mandalorian) that to get new subscribers, Disney would have to create new exclusive content.
  - Given that Disney could not and did not want to compete with Netflix on sheer volume, it had to compensate by spending more on its new shows, many of which were based off either the Star Wars or Marvel franchises.
  - Even with this constraint in place, Disney doubled its content spending because of Disney+, effectively

A NEW MARVEL TV SERIES

- Assume that Disney is considering a new 8-episode series that will spin off a Marvel character series, and expects each episode to cost $25 million. (Mandalorian cost $15 million/episode and Wandavision cost $25 million/episode).
- It is planning to offer it only to Disney+ subscribers.
  a. What are the benefits to Disney from adding this series?
  b. How would you go about estimating whether it is getting these promised benefits?
  c. Is there a way you can come to a NPV assessment?

EQUITY ANALYSIS: THE PARALLELS

- The investment analysis can be done entirely in equity terms, as well. The returns, cashflows and hurdle rates will all be defined from the perspective of equity investors.
- If using accounting returns,
  - Return will be Return on Equity (ROE) = Net Income/BV of Equity
  - ROE has to be greater than cost of equity
- If using discounted cashflow models,
  - Cashflows will be cashflows after debt payments to equity investors
  - Hurdle rate will be cost of equity

A VALE IRON ORE MINE IN CANADA INVESTMENT OPERATING ASSUMPTIONS

- The mine will **require an initial investment of $1.25 billion** and is expected to have a production capacity of 8 million tons of iron ore, once established. It will be **depreciated over ten years, using double declining balance depreciation, down to a salvage value of $250 million** at the end of ten years.
- The mine will start production midway through the next year, producing 4 million tons of iron ore for year 1, with production increasing to 6 million tons in year 2 and leveling off at 8 million tons thereafter (until year 10). **The price, in US dollars per ton of iron ore is currently $100 and is expected to keep pace with inflation for the life of the plant.**
- The **variable cost of production, including labor, material and operating expenses, is expected to be $45/ton of iron ore produced and there is a fixed cost of $125 million in year 1**. Both costs, which will grow at the inflation rate of 2% thereafter.
- The **working capital requirements are estimated to be 20% of total revenues**, and the investments have to be made at the beginning of each year. At the end of the tenth year, it is anticipated that the entire working capital will be salvaged.
- Vale's corporate tax rate of 34% will apply to this project as well.

FINANCING ASSUMPTIONS

- **Vale plans to borrow $0.5 billion** at its current cost of debt of 4.05% (based upon its rating of A-), using a ten-year term loan (where the loan will be paid off in equal annual increments).
- The breakdown of the payments each year into interest and principal are:

Year	Beginning Debt	Interest expense	Principal Repaid	Total Payment	Ending Debt
1	$500.00	$20.25	$41.55	$61.80	$458.45
2	$458.45	$18.57	$43.23	$61.80	$415.22
3	$415.22	$16.82	$44.98	$61.80	$370.24
4	$370.24	$14.99	$46.80	$61.80	$323.43
5	$323.43	$13.10	$48.70	$61.80	$274.73
6	$274.73	$11.13	$50.67	$61.80	$224.06
7	$224.06	$9.07	$52.72	$61.80	$171.34
8	$171.34	$6.94	$54.86	$61.80	$116.48
9	$116.48	$4.72	$57.08	$61.80	$59.39
10	$59.39	$2.41	$59.39	$61.80	$0.00

THE HURDLE RATE

- The **analysis is done US dollar terms and to equity investors.** Thus, the hurdle rate has to be a US $ cost of equity.
- In the earlier section, we estimated costs of equity, debt and capital in US dollars and $R for Vale's iron ore business.

Business	*Cost of equity*	*After-tax cost of debt*	*Debt ratio*	*Cost of capital (in US$)*	*Cost of capital (in $R)*
Metals & Mining	11.35%	2.67%	35.48%	8.27%	15.70%
Iron Ore	**11.13%**	**2.67%**	**35.48%**	**8.13%**	**15.55%**
Fertilizers	12.70%	2.67%	35.48%	9.14%	16.63%
Logistics	10.29%	2.67%	35.48%	7.59%	14.97%
Vale Operations	11.23%	2.67%	35.48%	8.20%	15.62%

NET INCOME: VALE IRON ORE MINE

	1	2	3	4	5	6	7	8	9	10
Production (millions of tons)	4.00	6.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
* Price per ton	102	104.04	106.12	108.24	110.41	112.62	114.87	117.17	119.51	121.9
= Revenues (millions US$)	$408.00	$624.24	$848.97	$865.95	$883.26	$900.93	$918.95	$937.33	$956.07	$975.20
- Variable Costs	$180.00	$275.40	$374.54	$382.03	$389.68	$397.47	$405.42	$413.53	$421.80	$430.23
- Fixed Costs	$125.00	$127.50	$130.05	$132.65	$135.30	$138.01	$140.77	$143.59	$146.46	$149.39
- Depreciation	$200.00	$160.00	$128.00	$102.40	$81.92	$65.54	$65.54	$65.54	$65.54	$65.54
EBIT	-$97.00	$61.34	$216.37	$248.86	$276.37	$299.91	$307.22	$314.68	$322.28	$330.04
- Interest Expenses	$20.25	$18.57	$16.82	$14.99	$13.10	$11.13	$9.07	$6.94	$4.72	$2.41
Taxable Income	-$117.25	$42.77	$199.56	$233.87	$263.27	$288.79	$298.15	$307.74	$317.57	$327.63
- Taxes	($39.87)	$14.54	$67.85	$79.51	$89.51	$98.19	$101.37	$104.63	$107.97	$111.40
= Net Income (millions US$)	-$77.39	$28.23	$131.71	$154.35	$173.76	$190.60	$196.78	$203.11	$209.59	$216.24
Book Value and Depreciation										
Beg. Book Value	$1,250.00	$1,050.00	$890.00	$762.00	$659.60	$577.68	$512.14	$446.61	$381.07	$315.54
- Depreciation	$200.00	$160.00	$128.00	$102.40	$81.92	$65.54	$65.54	$65.54	$65.54	$65.54
+ Capital Exp.	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
End Book Value	$1,050.00	$890.00	$762.00	$659.60	$577.68	$512.14	$446.61	$381.07	$315.54	$250.00
- Debt Outstanding	$458.45	$415.22	$370.24	$323.43	$274.73	$224.06	$171.34	$116.48	$59.39	$0.00
End Book Value of Equity	$591.55	$474.78	$391.76	$336.17	$302.95	$288.08	$275.27	$264.60	$256.14	$250.00

A ROE ANALYSIS

Year	Net Income	Beg. BV: Assets	Depreciation	Capital Expense	Ending BV: Assets	BV of Working Capital	Debt	BV: Equity	Average BV: Equity	ROE
0		$0.00	$0.00	$1,250.00	$1,250.00	$81.60	$500.00	$831.60		
1	($77.39)	$1,250.00	$200.00	$0.00	$1,050.00	$124.85	$458.45	$716.40	$774.00	-10.00%
2	$28.23	$1,050.00	$160.00	$0.00	$890.00	$169.79	$415.22	$644.57	$680.49	4.15%
3	$131.71	$890.00	$128.00	$0.00	$762.00	$173.19	$370.24	$564.95	$604.76	21.78%
4	$154.35	$762.00	$102.40	$0.00	$659.60	$176.65	$323.43	$512.82	$538.89	28.64%
5	$173.76	$659.60	$81.92	$0.00	$577.68	$180.19	$274.73	$483.13	$497.98	34.89%
6	$190.60	$577.68	$65.54	$0.00	$512.14	$183.79	$224.06	$471.87	$477.50	39.92%
7	$196.78	$512.14	$65.54	$0.00	$446.61	$187.47	$171.34	$462.74	$467.31	42.11%
8	$203.11	$446.61	$65.54	$0.00	$381.07	$191.21	$116.48	$455.81	$459.27	44.22%
9	$209.59	$381.07	$65.54	$0.00	$315.54	$195.04	$59.39	$451.18	$453.50	46.22%
10	$216.24	$315.54	$65.54	$0.00	$250.00	$0.00	$0.00	$250.00	$350.59	61.68%
Average ROE over the ten-year period =										31.36%

US $ ROE of 31.36% is greater than

Vale Iron Ore US$ Cost of Equity of 11.13%

FROM PROJECT ROE TO FIRM ROE

- As with the earlier analysis, where we used return on capital and cost of capital to measure the overall quality of projects at firms, we can compute return on equity and cost of equity to pass judgment on whether firms are creating value to its equity investors.
- Specifically, we can compute the return on equity (net income as a percentage of book equity) and compare to the cost of equity. The return spread is then:
  - Equity Return Spread = Return on Equity – Cost of equity
- This measure is particularly useful for financial service firms, where capital, return on capital and cost of capital are difficult measures to nail down. For non-financial service firms, it provides a secondary (albeit a more volatile measure of performance). While it usually provides the same general result that the excess return computed from return on capital, there can be cases where the two measures diverge.
- Applied to Disney in 2013, for example, here is what we get:
  - ROE in 2013 = Net Income in 2013 / Book Value of Equity in 2013 = 14.62%
  - Cost of Equity for Disney = 8.52%

AN INCREMENTAL CF ANALYSIS

	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Net Income		($77.39)	$28.23	$131.71	$154.35	$173.76	$190.60	$196.78	$203.11	$209.59	$216.24
+ Depreciation & Amortization		$200.00	$160.00	$128.00	$102.40	$81.92	$65.54	$65.54	$65.54	$65.54	$65.54
- Capital Expenditures	$750.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
- Change in Working Capital	$81.60	$43.25	$44.95	$3.40	$3.46	$3.53	$3.60	$3.68	$3.75	$3.82	($195.04)
- Debt Repayments		$41.55	$43.23	$44.98	$46.80	$48.70	$50.67	$52.72	$54.86	$57.08	$59.39
+ Salvage Value of mine											$250.00
Cashflow to Equity	($831.60)	$37.82	$100.05	$211.33	$206.48	$203.44	$201.86	$205.91	$210.04	$214.22	$667.42

The equity portion of my initial investment

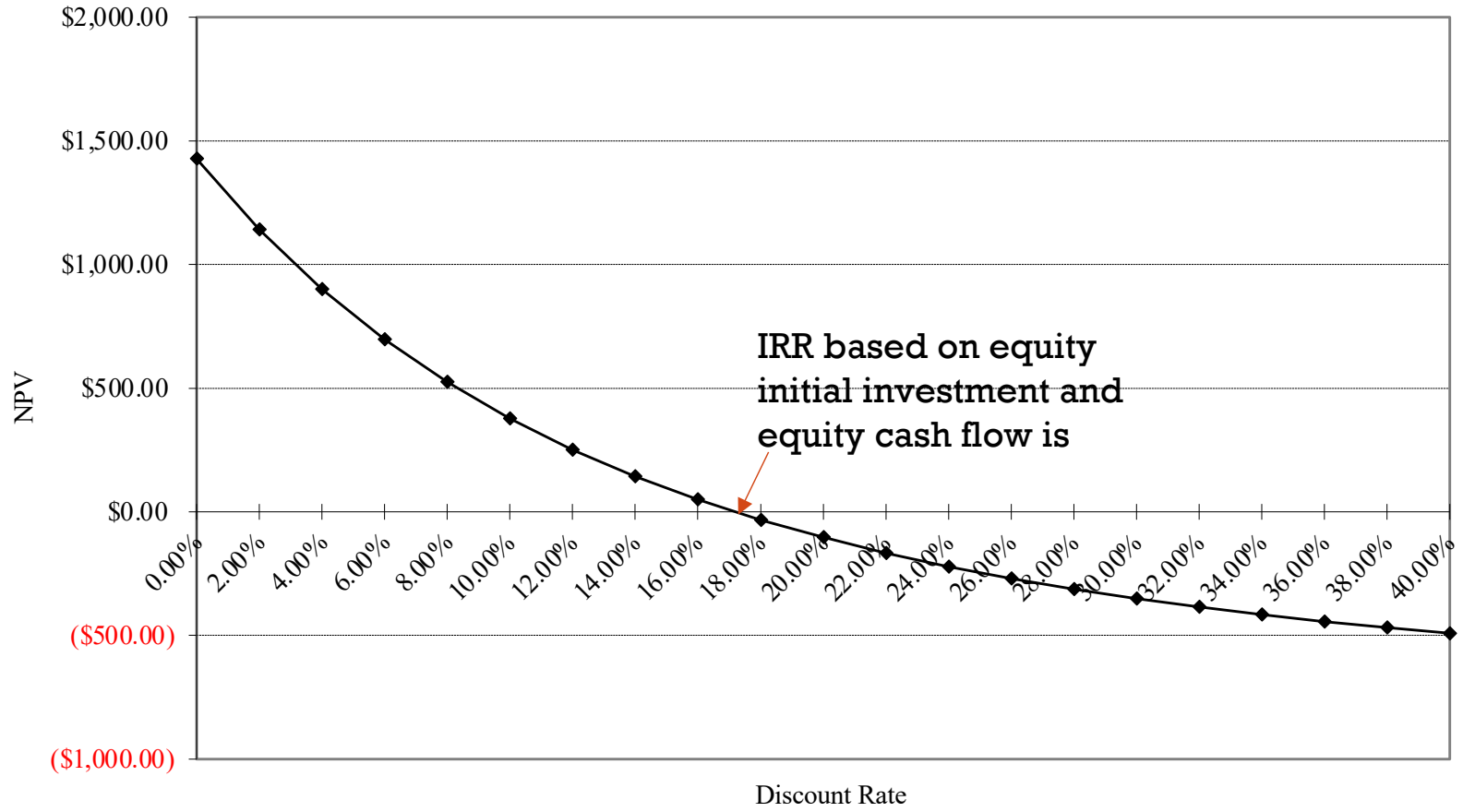
AN EQUITY NPV

Discounted at US$ cost of equity of 11.13% for Vale's iron ore business

Year	Cash flow to equity	PV @11.13%
0	-$831.60	-$831.60
1	$37.82	$34.03
2	$100.05	$81.02
3	$211.33	$153.99
4	$206.48	$135.40
5	$203.44	$120.04
6	$201.86	$107.18
7	$205.91	$98.39
8	$210.04	$90.31
9	$214.22	$82.89
10	$667.42	$232.38
NPV		$304.04

AN EQUITY IRR

Figure 5.6: NPV Profile on Equity Investment in Iron Ore Mine- Vale



REAL VERSUS NOMINAL ANALYSIS

- In computing the NPV of the plant, we estimated US $ cash flows and discounted them at the US $ cost of equity.
- We could have estimated the cash flows in real terms (with no inflation) and discounted them at a real cost of equity. Would the answer be different?

a. Yes

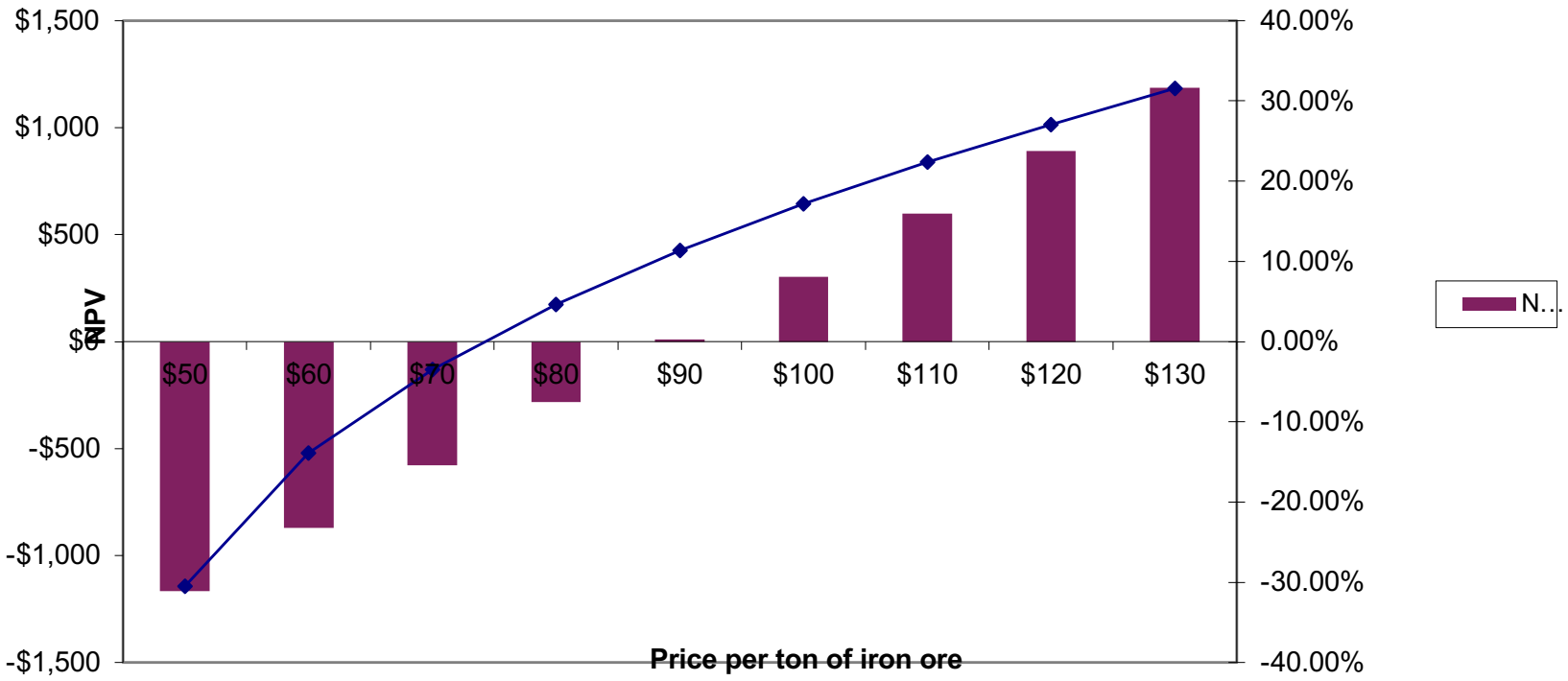
b. No

- Explain.

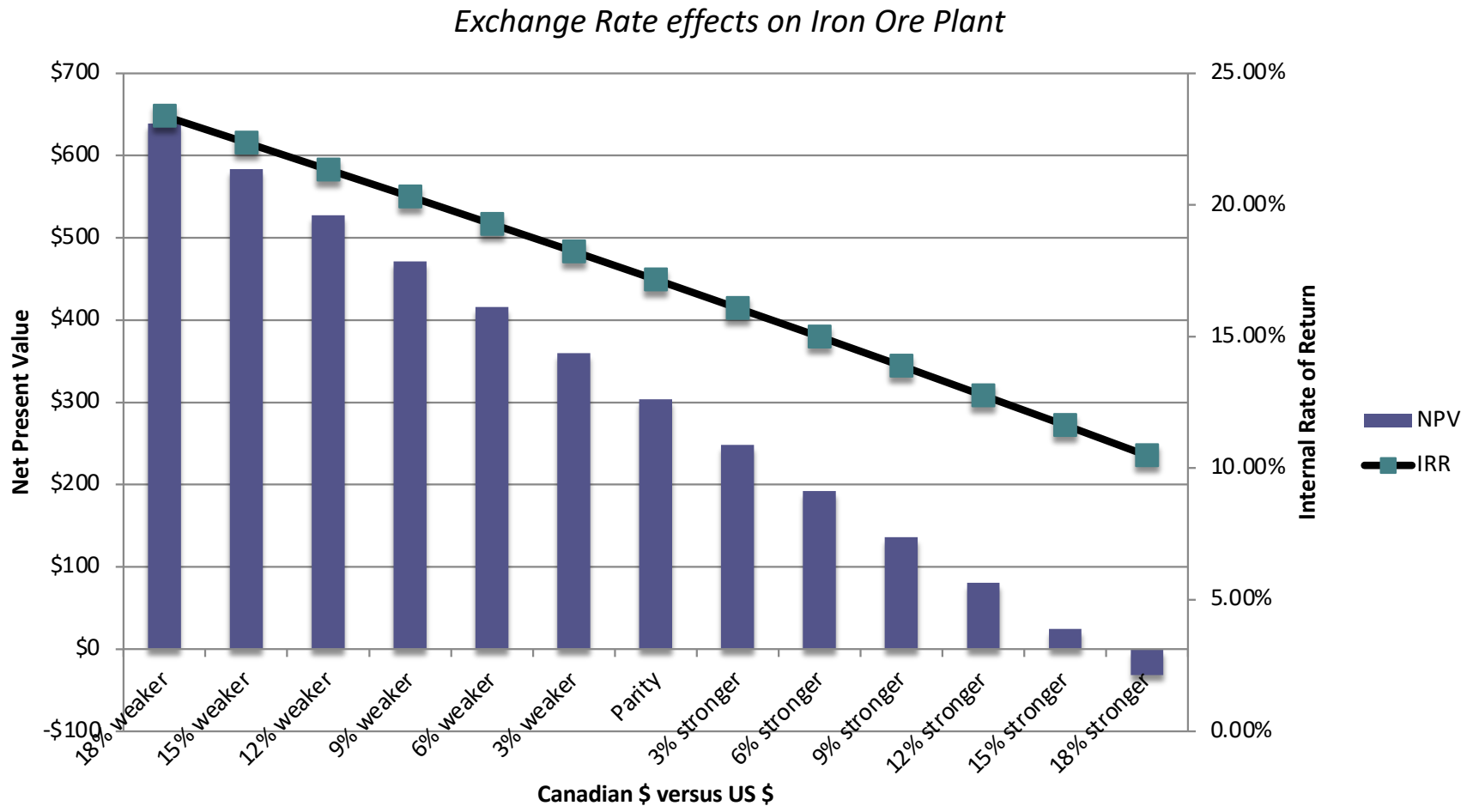
DEALING WITH MACRO UNCERTAINTY: THE EFFECT OF IRON ORE PRICE

- Like the Disney Theme Park, the Vale Iron Ore Mine's actual value will be buffeted as the variables change. The biggest source of variability is an external factor –the price of iron ore.

Vale Paper Plant: Effect of Changing Iron Ore Prices



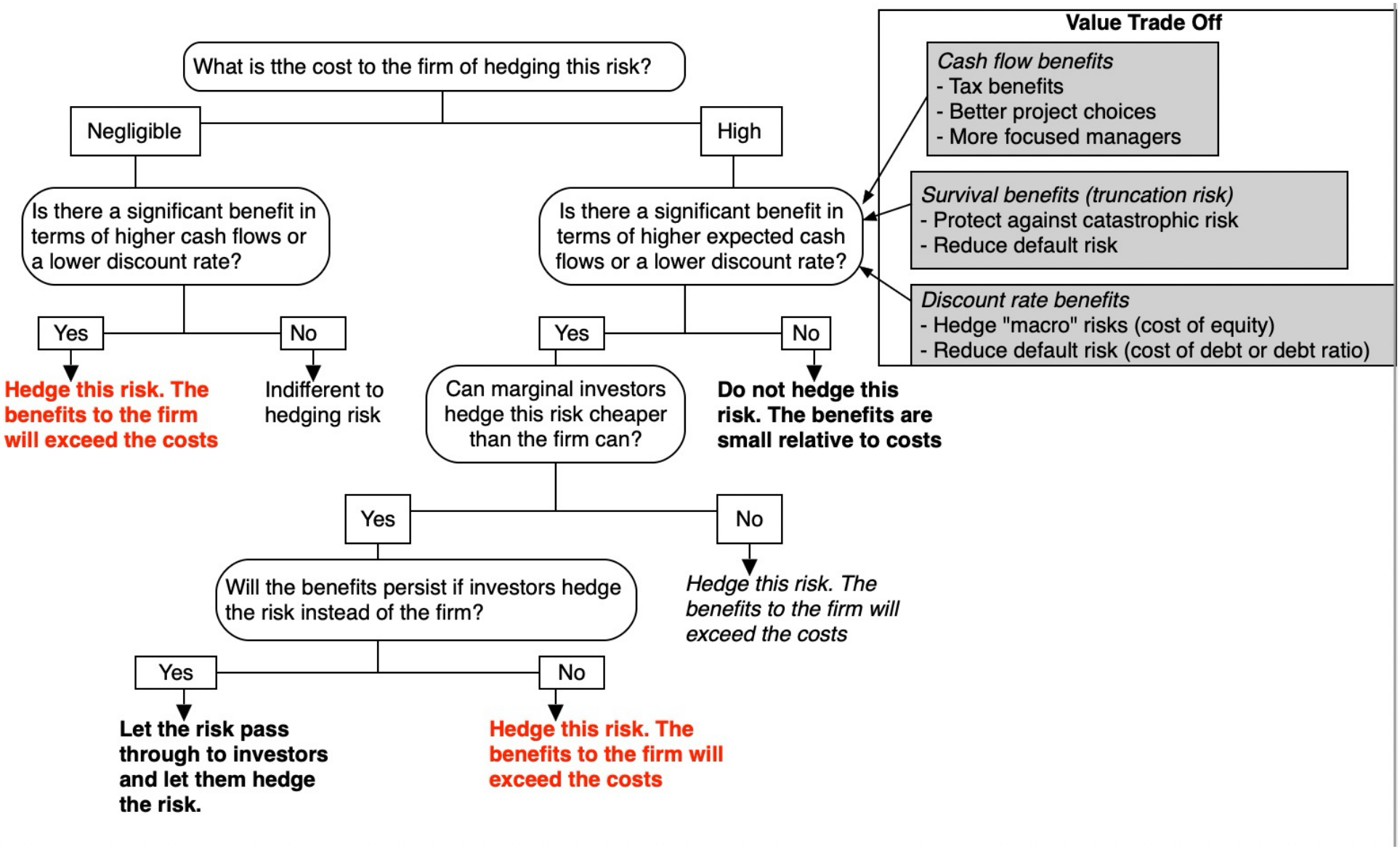
AND EXCHANGE RATES...



SHOULD YOU HEDGE?

- The value of this mine is very much a function iron ore prices. There are futures, forward and option markets iron ore that Vale can use to hedge against price movements. Should it?
  a. Yes
  b. No
- Explain.
- The value of the mine is also a function of exchange rates. There are forward, futures and options markets on currency. Should Vale hedge against exchange rate risk?
  a. Yes
  b. No
- Explain.
- On the last question, would your answer have been different if the mine were in Brazil.
  a. Yes
  b. No

To hedge or not to hedge?



ACQUISITIONS AND PROJECTS

- An **acquisition is an investment/project like any other** and all of the rules that apply to traditional investments should apply to acquisitions as well. In other words, for an acquisition to make sense:
  - It should have positive NPV. The present value of the expected cash flows from the acquisition should exceed the price paid on the acquisition.
  - The IRR of the cash flows to the firm (equity) from the acquisition > Cost of capital (equity) on the acquisition
- In estimating the cash flows on the acquisition, we should **count in any possible cash flows from synergy.**
- The discount rate to assess the present value should be based upon the risk of the investment (target company) and not the entity considering the investment (acquiring company).

TATA MOTORS AND HARMAN INTERNATIONAL

- Harman International is a publicly traded US firm that manufactures high end audio equipment. Tata Motors is an automobile company, based in India.
- Tata Motors is considering an acquisition of Harman, with an eye on using its audio equipment in its Indian automobiles, as optional upgrades on new cars.

ESTIMATING THE COST OF CAPITAL FOR THE ACQUISITION (NO SYNERGY)

- **Currency**: Estimated in US $, since cash flows will be estimated in US $.
- **Beta**: Harman International is an electronic company and we use the unlevered beta (1.17) of electronics companies in the US.
- **Equity Risk Premium**: Computed based on Harman's operating exposure:

	Revenues: 2012-13 (in millions)	ERP	Weight	Weight *ERP
United States	$1,181	5.50%	27.48%	1.51%
Germany	$1,482	5.50%	34.48%	1.90%
Rest of Europe	$819	7.02%	19.06%	1.34%
Asia	$816	7.27%	18.99%	1.38%
Harman	*$4,298*		*100.00%*	*6.13%*

- **Debt ratio & cost of debt**: Tata Motors plans to assume the existing debt of Harman International and to preserve Harman's existing debt ratio. Harman currently has a debt (including lease commitments) to capital ratio of 7.39% (translating into a debt to equity ratio of 7.98%) and faces a pre-tax cost of debt of 4.75% (based on its BBB- rating).
- Levered Beta = 1.17 (1+ (1-.40) (.0798)) = 1.226
- Cost of Equity= 2.75% + 1.226 (6.13%) = 10.26%

Cost of Capital = 10.26% (1-.0739) + 4.75% (1-.40) (.0739) = 9.67%

ESTIMATING CASHFLOWS- FIRST STEPS

- **Operating Income**: The firm reported operating income of $201.25 million on revenues of $4.30 billion for the year. Adding back non-recurring expenses (restructuring charge of $83.2 million in 2013) and adjusting income for the conversion of operating lease commitments to debt, we estimated an adjusted operating income of $313.2 million. The firm paid 18.21% of its income as taxes in 2013 and we will use this as the effective tax rate for the cash flows.
- **Reinvestment**: Depreciation in 2013 amounted to $128.2 million, whereas capital expenditures and acquisitions for the year were $206.4 million. Non-cash working capital increased by $272.6 million during 2013 but was 13.54% of revenues in 2013.

BRINGING IN GROWTH

- We will assume that Harman International is a mature firm, growing 2.75% in perpetuity.
- We assume that revenues, operating income, capital expenditures and depreciation will all grow 2.75% for the year and that the non-cash working capital remain 13.54% of revenues in future periods.

	2013	2014
Revenues	$4,297.80	$4,415.99
Operating income	$313.19	$321.80
Tax rate	18.21%	18.21%
After-tax Operating income	$256.16	$263.21
+ Depreciation	$128.20	$131.73
- Capital Expenditures	$206.40	$212.08
- Change in non-cash WC	$272.60	$16.01
Cash flow to the firm	-$94.64	$166.85

VALUE OF HARMAN INTERNATIONAL: BEFORE SYNERGY

- Earlier, we estimated the cost of capital of 9.67% as the right discount rate to apply in valuing Harman International and the cash flow to the firm of $166.85 million for 2014 (next year), assuming a 2.75% growth rate in revenues, operating income, depreciation, capital expenditures and total non-cash working capital. We also assumed that these cash flows would continue to grow 2.75% a year in perpetuity.

$$\text{Value of Operating Assets} = \frac{\text{Expected Cashflow to the firm next year}}{\text{(Cost of Capital - Stable growth rate)}}$$

$$= \frac{\$166.85}{(.0967 - .0275)} = \$2,476 \text{ million}$$

- Adding the cash balance of the firm ($515 million) and subtracting out the existing debt ($313 million, including the debt value of leases) yields the value of equity in the firm:
  - Value of Equity = $2,476 + $ 515 - $313 million = $2,678 million
- The market value of equity in Harman in November 2013 was $5,428 million. To the extent that Tata Motors pays the market price, it will have to generate benefits from synergy that exceed $2750 million.

MEASURING INVESTMENT RETURNS II. INVESTMENT INTERACTIONS, OPTIONS AND REMORSE...

Life is too short for regrets, right?

INDEPENDENT INVESTMENTS ARE THE EXCEPTION...

- In all of the examples we have used so far, the investments that we have analyzed have stood alone. Thus, our job was a simple one. Assess the expected cash flows on the investment and discount them at the right discount rate.
- In the real world, most investments are not independent. Taking an investment can often mean rejecting another investment at one extreme (mutually exclusive) to being locked in to take an investment in the future (pre-requisite).
- More generally, accepting an investment can create side costs for a firm's existing investments in some cases and benefits for others.

I. MUTUALLY EXCLUSIVE INVESTMENTS

- We have looked at how best to assess a stand-alone investment and concluded that a good investment will have positive NPV and generate accounting returns (ROC and ROE) and IRR that exceed your costs (capital and equity).
- In some cases, though, firms may have to choose between investments because
  - **They are mutually exclusive**: Taking one investment makes the other one redundant because they both serve the same purpose
  - **The firm has limited capital** and cannot take every good investment (i.e., investments with positive NPV or high IRR).
- Using the two standard discounted cash flow measures, NPV and IRR, can yield different choices when choosing between investments.

COMPARING PROJECTS WITH THE SAME (OR SIMILAR) LIVES..

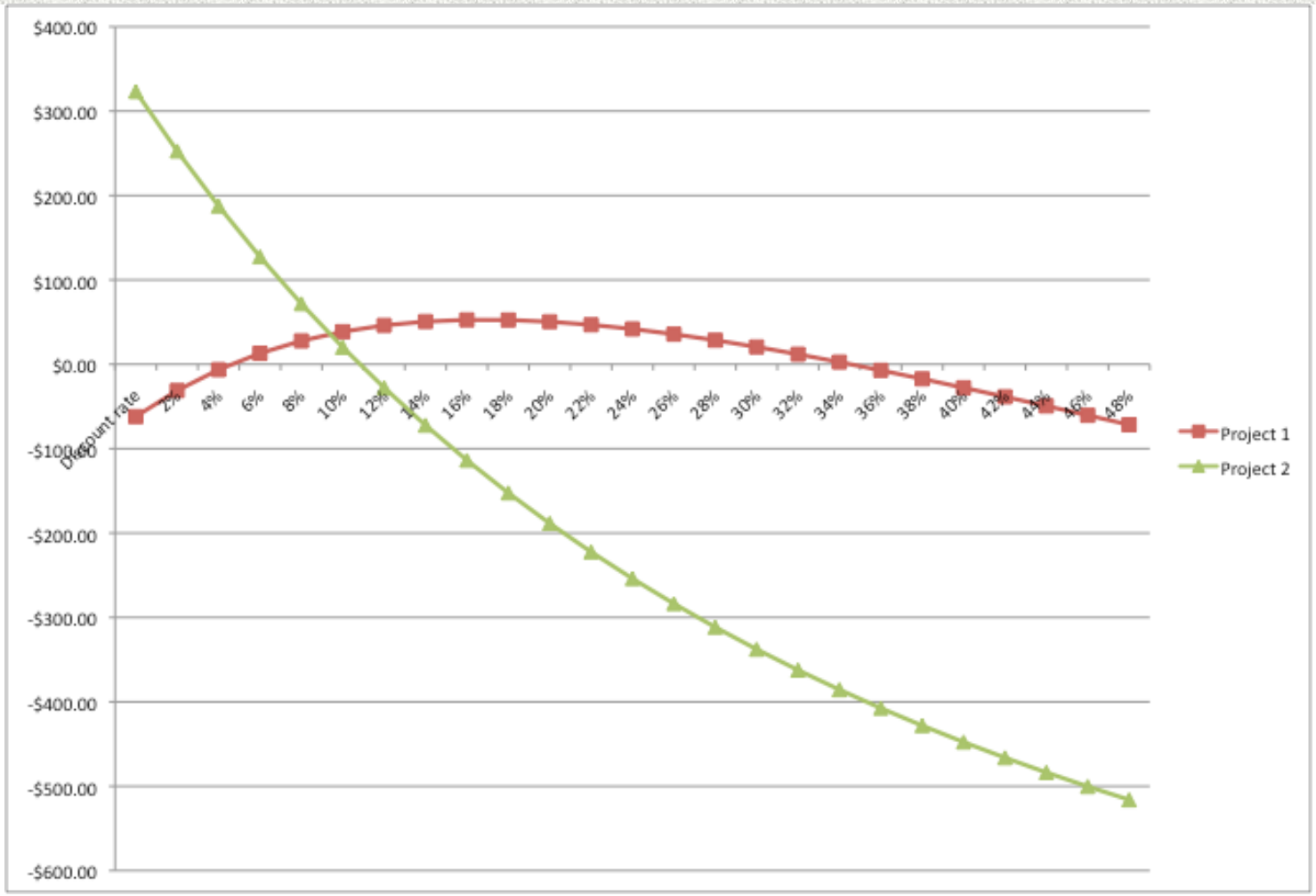
- When comparing and choosing between investments with the same lives, we can
  - Compute the accounting returns (ROC, ROE) of the investments and pick the one with the higher returns
  - Compute the NPV of the investments and pick the one with the higher NPV
  - Compute the IRR of the investments and pick the one with the higher IRR
- While it is easy to see why accounting return measures can give different rankings (and choices) than the discounted cash flow approaches, you would expect NPV and IRR to yield consistent results since they are both time-weighted, incremental cash flow return measures.

CASE 1: IRR VERSUS NPV

- Consider two projects with the following cash flows:

Year	Project 1 CF	Project 2 CF
0	-1000	-1000
1	800	200
2	1000	300
3	1300	400
4	-2200	500

PROJECT'S NPV PROFILE



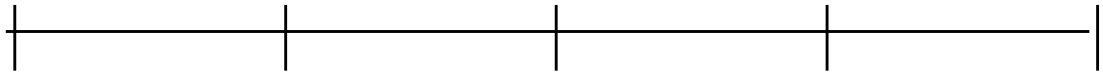
WHAT DO WE DO NOW?

- **Project 1 has two internal rates of return.** The first is 6.60%, whereas the second is 36.55%. Project 2 has one internal rate of return, about 12.8%.
- Why are there two internal rates of return on project 1?
- If your cost of capital is 12%, which investment would you accept?
  a. Project 1
  b. Project 2
- Explain.

CASE 2: NPV VERSUS IRR

Project A

Cash Flow $ 350,000 $ 450,000 $ 600,000 $ 750,000

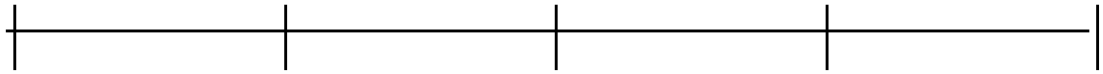


Investment $ 1,000,000

NPV = $467,937
IRR= 33.66%

Project B

Cash Flow $ 3,000,000 $ 3,500,000 $ 4,500,000 $ 5,500,000



Investment $ 10,000,000

NPV = $1,358,664
IRR=20.88%

WHICH ONE WOULD YOU PICK?

- Assume that you can pick only one of these two projects. Your choice will clearly vary depending upon whether you look at NPV or IRR. You have enough money currently on hand to take either. Which one would you pick?
  a. Project A. It gives me the bigger bang for the buck and more margin for error.
  b. Project B. It creates more dollar value in my business.
- If you pick A, what would your biggest concern be?
- If you pick B, what would your biggest concern be?

CAPITAL RATIONING, UNCERTAINTY AND CHOOSING A RULE

- If a business has limited access to capital, has a stream of surplus value projects and faces more uncertainty in its project cash flows, it is much more likely to use IRR as its decision rule.
  - Small, high-growth companies and private businesses are much more likely to use IRR.
- If a business has substantial funds on hand, access to capital, limited surplus value projects, and more certainty on its project cash flows, it is much more likely to use NPV as its decision rule.
- As firms go public and grow, they are much more likely to gain from using NPV.

THE SOURCES OF CAPITAL RATIONING...

Cause	*Number of firms*	*Percent of total*
Debt limit imposed by outside agreement	10	10.7
Debt limit placed by management external to firm	3	3.2
Limit placed on borrowing by internal management	65	69.1
Restrictive policy imposed on retained earnings	2	2.1
Maintenance of target EPS or PE ratio	14	14.9

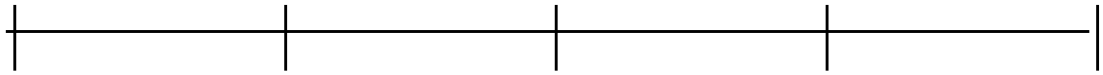
AN ALTERNATIVE TO IRR WITH CAPITAL RATIONING

- The problem with the NPV rule, when there is capital rationing, is that it is a dollar value. It measures success in absolute terms.
- The NPV **can be converted into a relative measure by dividing by the initial investment**. This is called the profitability index.
  - Profitability Index (PI) = NPV/Initial Investment
- In the example described, the PI of the two projects would have been:
  - PI of Project A = $467,937/1,000,000 = 46.79%
  - PI of Project B = $1,358,664/10,000,000 = 13.59%
  - Project A would have scored higher.

CASE 3: NPV VERSUS IRR

Project A

Cash Flow $ 5,000,000 $ 4,000,000 $ 3,200,000 $ 3,000,000

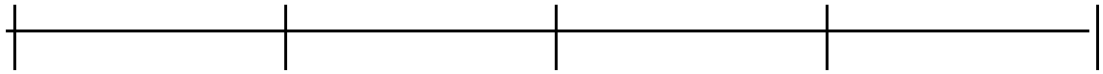


Investment $ 10,000,000

NPV = $1,191,712
IRR=21.41%

Project B

Cash Flow $ 3,000,000 $ 3,500,000 $ 4,500,000 $ 5,500,000



Investment $ 10,000,000

NPV = $1,358,664
IRR=20.88%

WHY THE DIFFERENCE?

- These projects are of the same scale. Both the NPV and IRR use time-weighted cash flows. Yet, the rankings are different. Why?

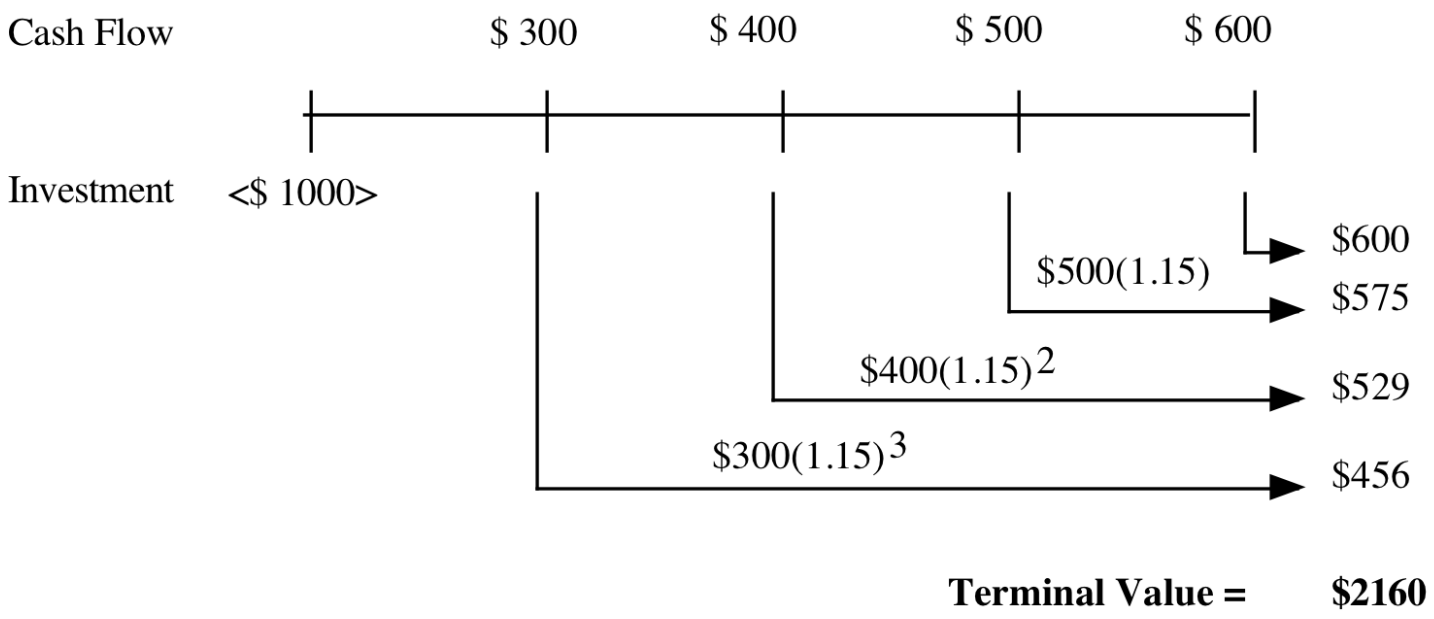
- Which one would you pick?
  a. Project A. It gives me the bigger bang for the buck and more margin for error.
  b. Project B. It creates more dollar value in my business.

NPV, IRR AND THE REINVESTMENT RATE ASSUMPTION

- The NPV rule assumes that intermediate cash flows on the project **get reinvested at the hurdle rate** (which is based upon what projects of comparable risk should earn).
- The IRR rule assumes that **intermediate cash flows on the project get reinvested at the IRR.** Implicit is the assumption that the firm has an infinite stream of projects yielding similar IRRs.
- Conclusion: When the IRR is high (the project is creating significant surplus value) and the project life is long, the IRR will overstate the true return on the project.

SOLUTION TO REINVESTMENT RATE PROBLEM

Figure 6.3: IRR versus Modified Internal Rate of Return



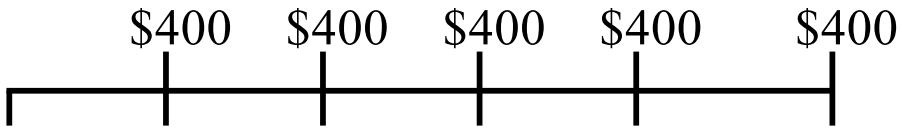
Internal Rate of Return = 24.89%
Modified Internal Rate of Return = 21.23%

WHY NPV AND IRR MAY DIFFER.. EVEN IF PROJECTS HAVE THE SAME LIVES

1. A project can **have only one NPV**, whereas it can have more than one IRR.
2. The NPV is a **dollar surplus value**, whereas the IRR is a percentage measure of return. The NPV is therefore likely to be larger for "large scale" projects, while the IRR is higher for "small-scale" projects.
3. The NPV assumes that **intermediate cash flows get reinvested at the "hurdle rate"**, which is based upon what you can make on investments of comparable risk, while the IRR assumes that intermediate cash flows get reinvested at the "IRR".

COMPARING PROJECTS WITH DIFFERENT LIVES..

Project A



-$1000

NPV of Project A = $ 442
IRR of Project A = 28.7%

Project B



-$1500

NPV of Project B = $ 478
IRR for Project B = 19.4%

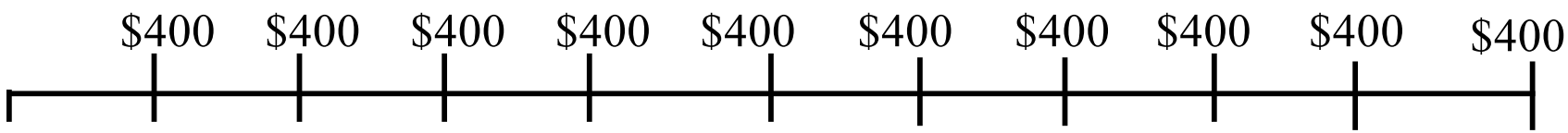
Hurdle Rate for Both Projects = 12%

WHY NPVS CANNOT BE COMPARED.. WHEN PROJECTS HAVE DIFFERENT LIVES.

- The net present values of mutually exclusive projects with different lives cannot be compared, since there is a bias towards longer-life projects. To compare the NPV, we have to
  - replicate the projects till they have the same life (or)
  - convert the net present values into annuities
- The IRR is unaffected by project life. We can choose the project with the higher IRR.

SOLUTION 1: PROJECT REPLICATION

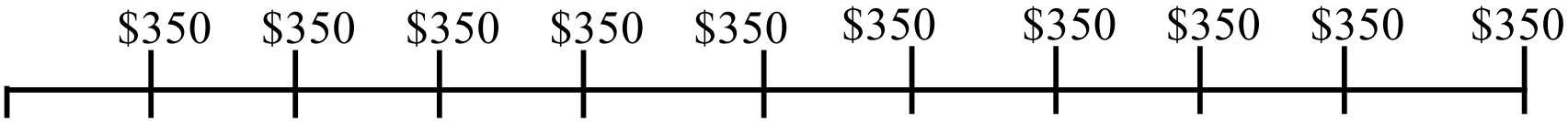
Project A: Replicated



-$1000 -$1000 (Replication)

NPV of Project A replicated = $ 693

Project B



-$1500

NPV of Project B= $ 478

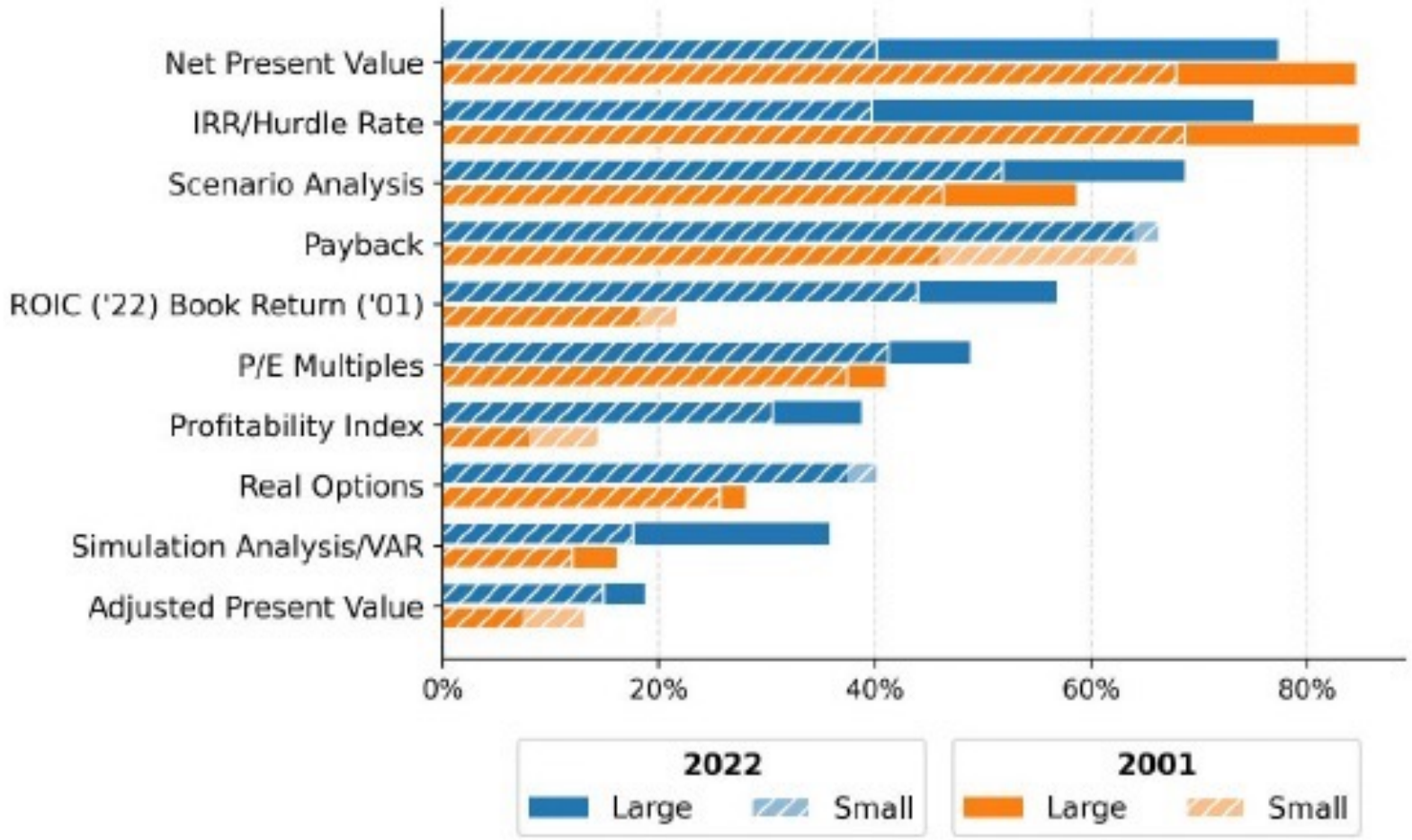
SOLUTION 2: EQUIVALENT ANNUITIES

- Equivalent Annuity for 5-year project
  = $442 * PV(A,12%,5 years)
  = $ 122.62
- Equivalent Annuity for 10-year project
  = $478 * PV(A,12%,10 years)
  = $ 84.60

WHAT WOULD YOU CHOOSE AS YOUR INVESTMENT TOOL?

- Given the advantages/disadvantages outlined for each of the different decision rules, which one would you choose to adopt?
  a. Return on Investment (ROE, ROC)
  b. Payback or Discounted Payback
  c. Net Present Value
  d. Internal Rate of Return
  e. Profitability Index
- Do you think your choice has been affected by the events of the last quarter of 2008? If so, why? If not, why not?

WHAT FIRMS ACTUALLY USE ..



II. 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.

A. OPPORTUNITY COST

- An opportunity cost arises when a project uses a resource that may already have been paid for by the firm.
- When a resource that is already owned by a firm is being considered for use in a project, this resource has to be priced on its next best alternative use, which may be
  - **a sale of the asset**, in which case the opportunity cost is the expected proceeds from the sale, net of any capital gains taxes
  - **renting or leasing the asset out**, in which case the opportunity cost is the expected present value of the after-tax rental or lease revenues.
  - **use elsewhere in the business**, in which case the opportunity cost is the cost of replacing it.

CASE 1: FOREGONE SALE?

- Assume that Disney owns land in Rio already. This land is undeveloped and was acquired several years ago for $ 5 million for a hotel that was never built.
- It is anticipated, if this theme park is built, that this land will be used to build the offices for Disney Rio. The land currently can be sold for $ 40 million, though that would create a capital gain (which will be taxed at 20%).
- In assessing the theme park, which of the following would you do:
  a. Ignore the cost of the land, since Disney owns its already
  b. Use the book value of the land, which is $ 5 million
  c. Use the market value of the land, which is $ 40 million
  d. Other:

CASE 2: INCREMENTAL COST?
AN ONLINE RETAILING VENTURE FOR BOOKSCAPE

- The initial investment needed to start the service, including the installation of additional phone lines and computer equipment, will be $1 million. These investments are expected to have a life of four years, at which point they will have no salvage value. The investments will be depreciated straight line over the four-year life.
  - The **revenues in the first year are expected to be $1.5 million, growing 20% in year two, and 10% in the two years following**. The **cost of the books will be 60% of the revenues** in each of the four years.
  - The **salaries and other benefits for the employees are estimated to be $150,000 in year one and grow 10% a year for the following three years**.
  - The working capital, which includes the inventory of books needed for the service and the accounts receivable **will be 10% of the revenues**; the investments in working capital have to be made at the beginning of each year. At the end of year 4, the entire working capital is assumed to be salvaged.
  - The tax rate on income is expected to be 40%.

COST OF CAPITAL FOR BOOKSCAPE INVESTMENT

- We will re-estimate the beta for this online project by looking at publicly traded online retailers.
  - The unlevered total beta of online retailers is 3.02, and we assume that this project will be funded with the same mix of debt and equity (D/E = 21.41%, Debt/Capital = 17.63%) that Bookscape uses in the rest of the business.
  - We will assume that Bookscape's tax rate (40%) and pre-tax cost of debt (4.05%) apply to this project.
    - Levered Beta Online Service = 3.02 [1 + (1 – 0.4) (0.2141)] = 3.41
    - Cost of Equity Online Service = 2.75% + 3.41 (5.5%) = 21.48%
    - Cost of CapitalOnline Service= 21.48% (0.8237) + 4.05% (1 – 0.4) (0.1763) = 18.12%
- This is much higher than the cost of capital (10.30%) we computed for Bookscape earlier, but it reflects the higher risk of the online retail venture.

INCREMENTAL CASH FLOWS ON INVESTMENT

	0	1	2	3	4
Revenues		$1,500,000	$1,800,000	$1,980,000	$2,178,000
Operating Expenses					
Labor		$150,000	$165,000	$181,500	$199,650
Materials		$900,000	$1,080,000	$1,188,000	$1,306,800
Depreciation		$250,000	$250,000	$250,000	$250,000
Operating Income		$200,000	$305,000	$360,500	$421,550
Taxes		$80,000	$122,000	$144,200	$168,620
After-tax Operating Income		$120,000	$183,000	$216,300	$252,930
+ Depreciation		$250,000	$250,000	$250,000	$250,000
- Change in Working Capital	$150,000	$30,000	$18,000	$19,800	-$217,800
+ Salvage Value of Investment					$0
Cash flow after taxes	-$1,150,000	$340,000	$415,000	$446,500	$720,730
Present Value	-$1,150,000	$287,836	$297,428	$270,908	$370,203

NPV of investment @18.12% = $76,375

THE SIDE COSTS...

- It is estimated that the additional business associated with online ordering and the administration of the service itself will add to the workload for the current general manager of the bookstore.
  - As a consequence, the salary of the general manager will be increased from $100,000 to $120,000 next year; it is expected to grow 5 percent a year after that for the remaining three years of the online venture.
  - After the online venture is ended in the fourth year, the manager's salary will revert back to its old levels.
- It is also estimated that Bookscape Online will utilize an office that is currently used to store financial records. The records will be moved to a bank vault, which will cost $1000 a year to rent.

NPV WITH SIDE COSTS...

- Additional salary costs = PV of $34,352

	1	*2*	*3*	*4*
Increase in Salary	$20,000	$21,000	$22,050	$23,153
After-tax expense	$12,000	$12,600	$13,230	$13,892
Present Value @18.12%	$10,159	$9,030	$8,027	$7,136

- Office Cost
  - After-Tax Additional Storage Expenditure per Year = $1,000 (1 – 0.40) = $600
  - PV of expenditures = $600 (PV of annuity, 18.12%,4 yrs) = $1,610
- NPV with Opportunity Costs = $76,375 – $34,352 – $1,610= $ 40,413
- Opportunity costs aggregated into cash flows

Year	Cashflows	Opportunity costs	Cashflow with opportunity costs	Present Value
0	($1,150,000)		($1,150,000)	($1,150,000)
1	$340,000	$12,600	$327,400	$277,170
2	$415,000	$13,200	$401,800	$287,968
3	$446,500	$13,830	$432,670	$262,517
4	$720,730	$14,492	$706,238	$362,759
Adjusted NPV				$40,413

CASE 3: EXCESS CAPACITY

- In the Vale example, assume that the firm will use its existing distribution system to service the production out of the new iron ore mine.
- The mine manager argues that there is no cost associated with using this system, since it has been paid for already and cannot be sold or leased to a competitor (and thus has no competing current use). Do you agree?
  a. Yes
  b. No

A FRAMEWORK FOR ASSESSING THE COST OF USING EXCESS CAPACITY

- If I do not add the new product, when will I run out of capacity?
- If I add the new product, when will I run out of capacity?
- When I run out of capacity, what will I do?
  a. Cut back on production: cost is PV of after-tax cash flows from lost sales
  b. Buy new capacity: cost is difference in PV between earlier & later investment

PRODUCT AND PROJECT CANNIBALIZATION: A REAL COST?

- Assume that in the Disney theme park example, 20% of the revenues at the Rio Disney park are expected to come from people who would have gone to Disney theme parks in the US. In doing the analysis of the park, you would
  a. Look at only incremental revenues (i.e. 80% of the total revenue)
  b. Look at total revenues at the park
  c. Choose an intermediate number
- Would your answer be different if you were analyzing whether to introduce a new show on the Disney cable channel on Saturday mornings that is expected to attract 20% of its viewers from ABC (which is also owned by Disney)?
  a. Yes
  b. No

B. PROJECT SYNERGIES

- A project **may provide benefits for other projects within the firm.** Consider, for instance, a typical Disney animated movie. Assume that it costs $ 50 million to produce and promote. This movie, in addition to theatrical revenues, also produces revenues from
  - the sale of merchandise (stuffed toys, plastic figures, clothes ..)
  - increased attendance at the theme parks
  - stage shows (see "Beauty and the Beast" and the "Lion King")
  - television series based upon the movie
- In investment analysis, however, these synergies are either left unquantified and used to justify overriding the results of investment analysis, i.e,, used as justification for investing in negative NPV projects.
- If synergies exist and they often do, these benefits have to be valued and shown in the initial project analysis.

CASE 1: ADDING A CAFÉ TO A BOOKSTORE: BOOKSCAPE

- Assume that you are considering adding a café to the bookstore. Assume also that based upon the expected revenues and expenses, the café standing alone is expected to have a net present value of -$87,571.
- The cafe will increase revenues at the book store by $500,000 in year 1, growing at 10% a year for the following 4 years. In addition, assume that the pre-tax operating margin on these sales is 10%.

		1	2	3	4	5
Increased Revenues		$500,000	$550,000	$605,000	$665,500	$732,050
Operating Margin		10.00%	10.00%	10.00%	10.00%	10.00%
Operating Income		$50,000	$55,000	$60,500	$66,550	$73,205
Operating Income after Taxes		$30,000	$33,000	$36,300	$39,930	$43,923
PV of Additional Cash Flows		$27,199	$27,126	$27,053	$26,981	$26,908
PV of Synergy Benefits		$135,268				

- The net present value of the added benefits is $135,268. Added to the NPV of the standalone Café of -$87,571 yields a net present value of $47,697.

CASE 2: SYNERGY IN A MERGER..

- We valued Harman International for an acquisition by Tata Motors and **estimated a value of $ 2,476 million for the operating assets and $ 2,678 million for the equity in the firm**, concluding that it would not be a value-creating acquisition at its **current market capitalization of $5,248 millio**n. In estimating this value, though, we treated Harman International as a stand-alone firm.
- Assume that Tata Motors foresees **potential synergies** in the combination of the two firms, primarily from using Harman's high-end audio technology (speakers, tuners) as optional upgrades for customers buying new Tata Motors cars in India.
- To value this synergy, let us assume the following:
  - It will take Tata Motors approximately 3 years to adapt Harman's products to Tata Motors cars.
  - Tata Motors will be able to **generate Rs 10 billion in after-tax operating income in year 4** from selling Harman audio upgrades to its Indian customers, growing at a rate of 4% a year after that in perpetuity (but only in India).

ESTIMATING THE COST OF CAPITAL TO USE IN VALUING SYNERGY..

- **Business risk**: The perceived synergies flow from optional add-ons in auto sales. We will begin with the levered beta of 1.10, that we estimated for Tata Motors in chapter 4, in estimating the cost of equity.
- **Geographic risk**: The second is that the synergies are expected to come from India; consequently, we will add the country risk premium of 3.60% for India, estimated in chapter 4 (for Tata Motors) to the mature market premium of 5.5%.
- **Debt ratio**: Finally, we will assume that the expansion will be entirely in India, with Tata Motors maintain its existing debt to capital ratio of 29.28% and its current rupee cost of debt of 9.6% and its marginal tax rate of 32.45%.
  - Cost of equity in Rupees = 6.57% + 1.10 (5.5%+3.60%) = 16.59%
  - Cost of debt in Rupees = 9.6% (1-.3245) = 6.50%
  - Cost of capital in Rupees = 16.59% (1-.2928) + 6.50% (.2928) = 13.63%

ESTIMATING THE VALUE OF SYNERGY... AND WHAT TATA CAN PAY FOR HARMAN

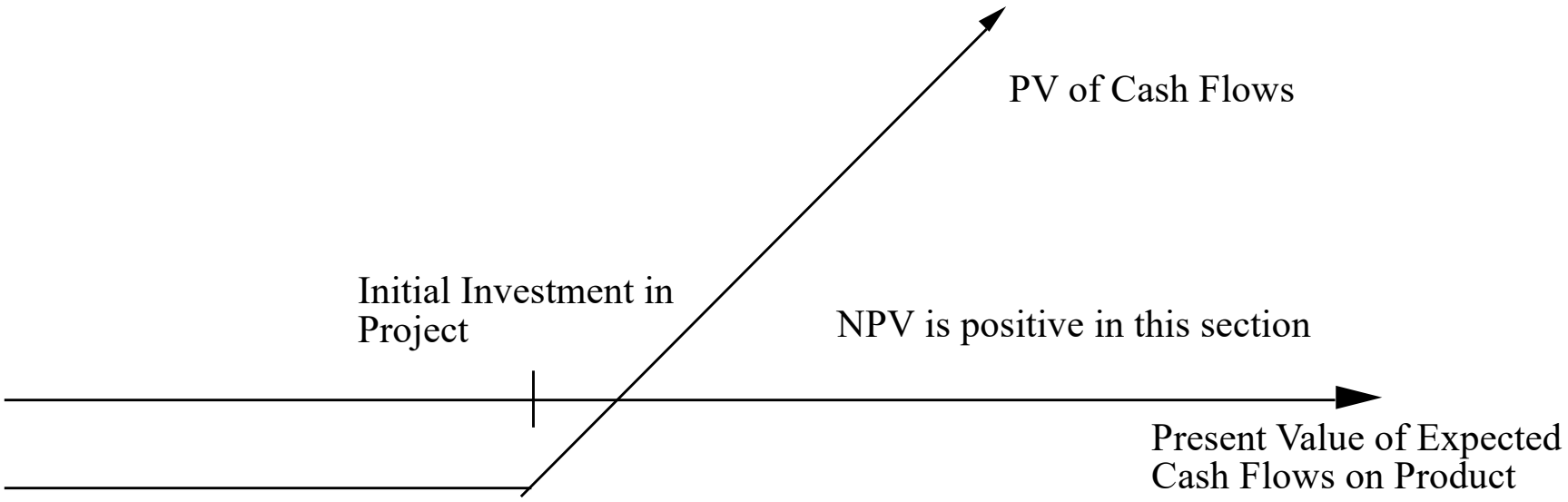
- Value of synergy Year 3 = $\frac{\text{Expected Cash Flow}_{\text{Year 4}}}{(\text{Cost of Capital} - g)} = \frac{10{,}000}{(.1363-.04)} =$ Rs 103,814 million
- Value of synergy today = $\frac{\text{Value of Synergy}_{\text{year 3}}}{(1+\text{Cost of Capital})^3} = \frac{103{,}814}{(1.1363)^3} =$ Rs 70,753 million
- Converting the synergy value into dollar terms at the prevailing exchange rate of Rs 60/$, we can estimate a dollar value for the synergy from the potential acquisition:
  - Value of synergy in US $ = Rs 70,753/60 = $ 1,179 million
- Adding this value to the intrinsic value of $2,678 million that we estimated for Harman's equity in chapter 5, we get a total value for the equity of $3,857 million.
  - Value of Harman = $2,678 million + $1,179 million = $3,857 million
- Since Harman's equity trades at $5,248 million, the acquisition still does not make sense, even with the synergy incorporated into value.

III. PROJECT OPTIONS

- One of the limitations of traditional investment analysis is that it is static and does not do a good job of capturing the options embedded in investment.
  - The first of these options is the **option to delay taking a project**, when a firm has exclusive rights to it, until a later date.
  - The second of these options is taking one project may allow us to take advantage of other opportunities (projects) in the future, i.e., **the option to expand.**
  - The last option that is embedded in projects is the **option to abandon a project**, if the cash flows do not measure up.
- These options all add value to projects and may make a "bad" project (from traditional analysis) into a good one.

THE OPTION TO DELAY

- When a firm has exclusive rights to a project or product for a specific period, it can delay taking this project or product until a later date.

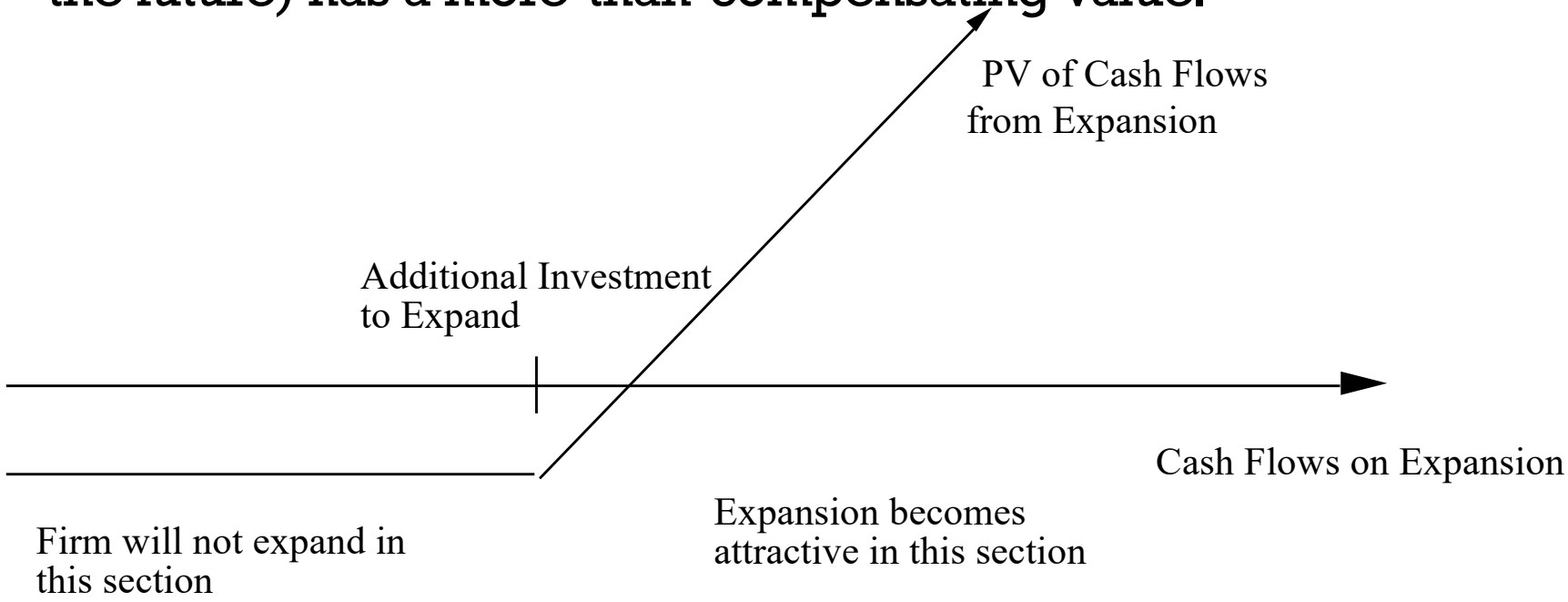


INSIGHTS FOR INVESTMENT ANALYSES

- A traditional investment analysis just answers the question of whether the project is a "good" one if taken today. The rights to a "bad" project can still have value.
- Having the exclusive rights to a product or project is valuable, even if the product or project is not viable today.
- The value of these rights increases with the volatility of the underlying business.
- The cost of acquiring these rights (by buying them or spending money on development - R&D, for instance) has to be weighed off against these benefits.

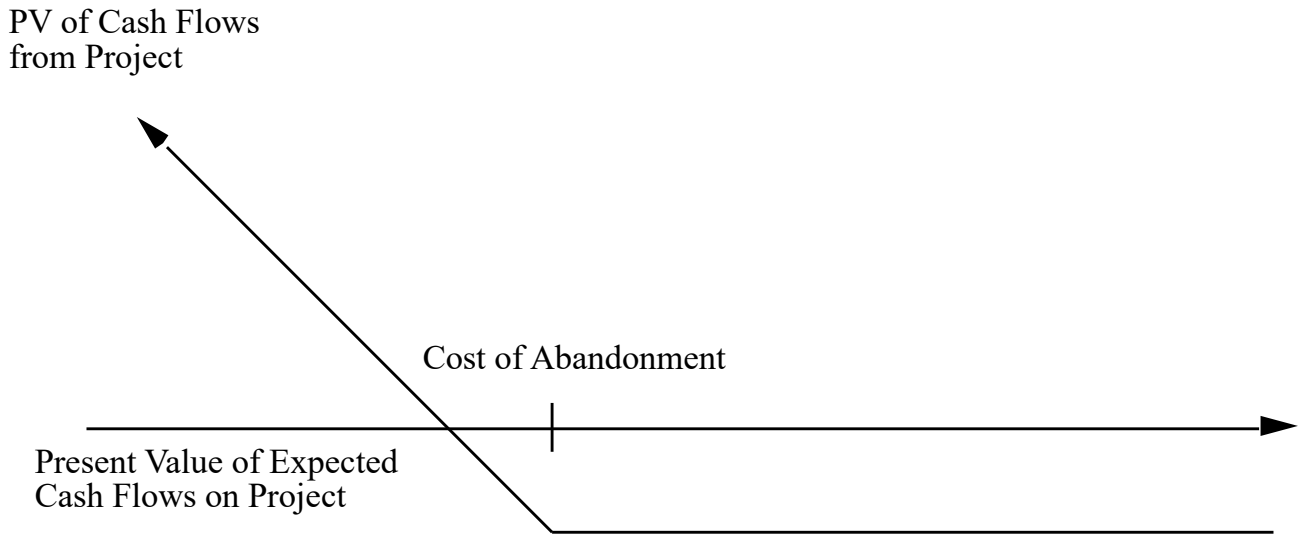
THE OPTION TO EXPAND/TAKE OTHER PROJECTS

- Taking a project today may allow a firm to consider and take other valuable projects in the future. Thus, even though a project may have a negative NPV, it may be a project worth taking if the option it provides the firm (to take other projects in the future) has a more-than-compensating value.

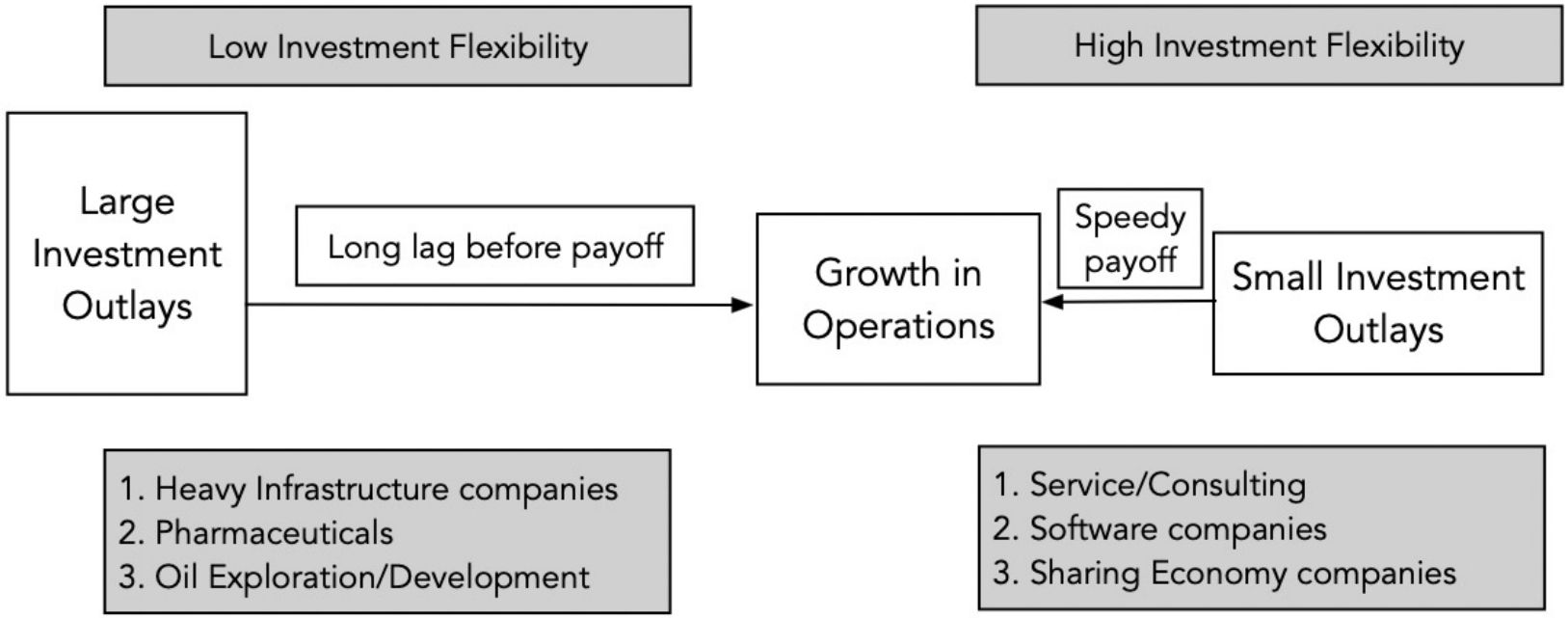


THE OPTION TO ABANDON

- A firm may sometimes have the option to abandon a project, if the cash flows do not measure up to expectations.
- If abandoning the project allows the firm to save itself from further losses, this option can make a project more valuable.



BOTTOM LINE: INVESTMENT FLEXIBILITY MATTERS..



AND ESPECIALLY DURING CRISIS... PERFORMANCE DURING 2020, ACROSS FIRM CLASSES

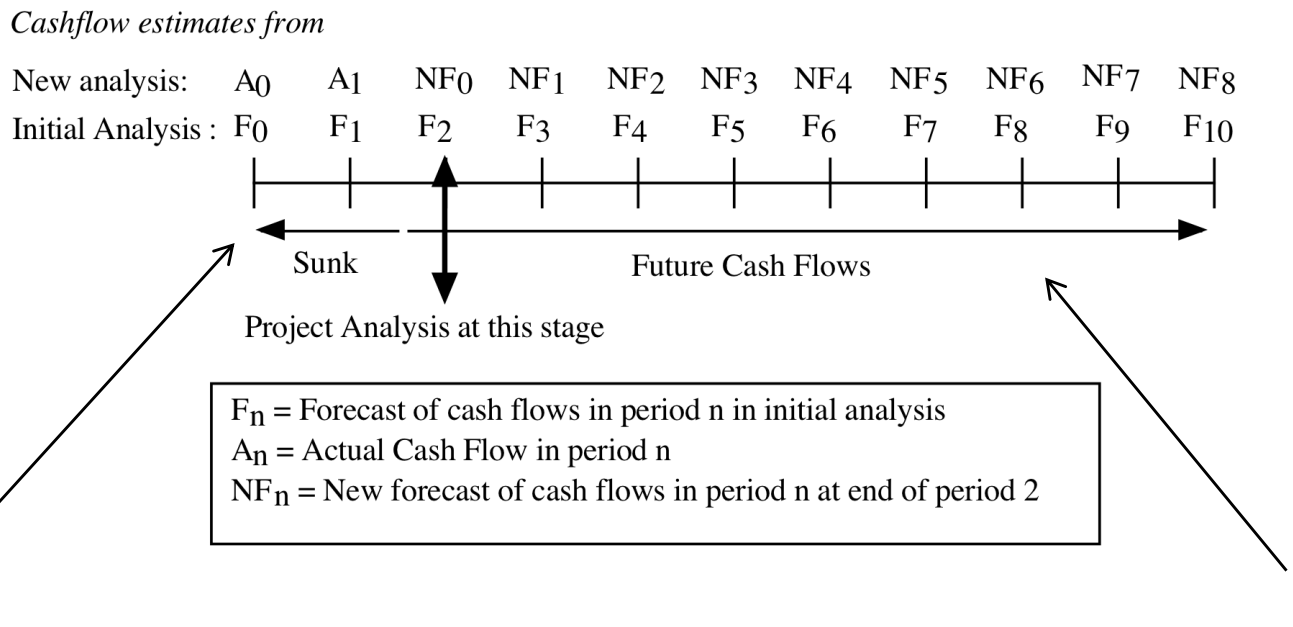
		Market Cap ($ millions)			Change in Market Cap ($ millions)			% Change in Market Cap		
Sales/Invested Capital	Number of firms	2/14/20	3/20/20	6/26/20	2/14-3/20	3/20-6/26	2/14-6/26	2/14-3/20	3/20-6/26	2/14-6/26
Lowest	3,411	$ 2,523,754	$ 1,622,667	$ 2,049,723	$ (901,086)	$ 427,056	$ (474,030)	-35.70%	26.32%	-18.78%
2nd decile	3,412	$ 8,263,640	$ 5,565,441	$ 6,732,043	$ (2,698,199)	$ 1,166,603	$(1,531,597)	-32.65%	20.96%	-18.53%
3rd decile	3,412	$ 9,811,923	$ 6,643,479	$ 8,244,577	$ (3,168,444)	$ 1,601,098	$(1,567,345)	-32.29%	24.10%	-15.97%
4th decile	3,411	$11,583,438	$ 8,280,917	$10,379,658	$ (3,302,521)	$ 2,098,741	$(1,203,780)	-28.51%	25.34%	-10.39%
5th decile	3,412	$10,667,397	$ 7,693,036	$ 9,613,456	$ (2,974,361)	$ 1,920,420	$(1,053,941)	-27.88%	24.96%	-9.88%
6th decile	3,412	$10,826,949	$ 7,976,816	$10,035,911	$ (2,850,133)	$ 2,059,095	$ (791,039)	-26.32%	25.81%	-7.31%
7th decile	3,411	$ 8,417,125	$ 5,810,221	$ 7,680,201	$ (2,606,904)	$ 1,869,980	$ (736,924)	-30.97%	32.18%	-8.76%
8th decile	3,412	$ 6,434,071	$ 4,547,709	$ 5,949,052	$ (1,886,362)	$ 1,401,343	$ (485,019)	-29.32%	30.81%	-7.54%
9th decile	3,412	$11,292,626	$ 8,300,143	$11,516,170	$ (2,992,483)	$ 3,216,027	$ 223,544	-26.50%	38.75%	1.98%
Highest	3,412	$ 5,312,563	$ 3,863,455	$ 5,113,297	$ (1,449,109)	$ 1,249,842	$ (199,266)	-27.28%	32.35%	-3.75%

IV. ASSESSING EXISTING OR PAST INVESTMENTS...

- While much of our discussion has been focused on analyzing new investments, the techniques and principles enunciated apply just as strongly to existing investments.
- With existing investments, we can try to address one of two questions:
  - **Post –mortem**: We can look back at existing investments and see if they have created value for the firm.
  - **What next?** We can also use the tools of investment analysis to see whether we should keep, expand or abandon existing investments.

ANALYZING AN EXISTING INVESTMENT

Figure 6.13: Analysis of Existing Project



In a post-mortem, you look at the actual cash flows, relative to forecasts.

You can also reassess your expected cash flows, based upon what you have learned, and decide whether you should expand, continue or divest (abandon) an investment

A. POST-MORTEM ANALYSIS

- The actual cash flows from an investment can be greater than or less than originally forecast for a number of reasons but all these reasons can be categorized into two groups:
  - **Chance**: The nature of risk is that actual outcomes can be different from expectations. Even when forecasts are based upon the best of information, they will invariably be wrong in hindsight because of unexpected shifts in both macro (inflation, interest rates, economic growth) and micro (competitors, company) variables.
  - **Bias**: If the original forecasts were biased, the actual numbers will be different from expectations. The evidence on capital budgeting is that managers tend to be over-optimistic about cash flows and the bias is worse with over-confident managers.
- While it is impossible to tell on an individual project whether chance or bias is to blame, there is a way to tell across projects and across time. **If chance is the culprit, there should be symmetry in the errors – actuals should be about as likely to beat forecasts as they are to come under forecasts. If bias is the reason, the errors will tend to be in one direction.**

B. WHAT SHOULD WE DO NEXT?

$$\sum_{t=0}^{t=n} \frac{NF_n}{(1+r)^n} < 0 \quad \text{.....} \quad \text{Liquidate the project}$$

$$\sum_{t=0}^{t=n} \frac{NF_n}{(1+r)^n} < \text{Salvage Value} \quad \text{.....} \quad \text{Terminate the project}$$

$$\sum_{t=0}^{t=n} \frac{NF_n}{(1+r)^n} < \text{Divestiture Value} \quad \text{.....} \quad \text{Divest the project}$$

$$\sum_{t=0}^{t=n} \frac{NF_n}{(1+r)^n} > 0 > \text{Divestiture Value} \quad \text{.....} \quad \text{Continue the project}$$

EXAMPLE: DISNEY CALIFORNIA ADVENTURE – THE 2008 JUDGMENT CALL

- Disney opened the Disney California Adventure (DCA) Park in 2001, at a cost of $1.5 billion, with a mix of roller coaster rides and movie nostalgia. Disney expected about 60% of its visitors to Disneyland to come across to DCA and generate about $ 100 million in annual after-cash flows for the firm.
- By 2008, DCA had not performed up to expectations. Of the 15 million people who came to Disneyland in 2007, only 6 million visited California Adventure, and **the cash flow averaged out to only $ 50 million between 2001 and 2007.**
- In early 2008, Disney faced three choices:
  - **Shut down** California Adventure and try to recover whatever it can of its initial investment. It is estimated that the firm recover about $ 500 million of its investment.
  - **Continue with the status quo**, recognizing that future cash flows will be closer to the actual values ($ 50 million) than the original projections.
  - **Invest about $ 600 million to expand and modify the park**, with the intent of increasing the number of attractions for families with children, is expected to increase the percentage of Disneyland visitors who come to DCA from 40% to 60% and increase the annual after tax cash flow by 60% (from $ 50 million to $ 80 million) at the park.

DCA: EVALUATING THE ALTERNATIVES...

- Continuing Operation: Assuming the current after-tax cash flow of $ 50 million will continue in perpetuity, growing at the inflation rate of 2% and discounting back at the theme park cost of capital in 2008 of 6.62% yields a value for continuing with the status quo
- Value of DCA = $\frac{\text{Expected Cash Flow next year}}{\text{(Cost of capital - g)}} = \frac{50(1.02)}{(.0662 - .02)} = \$1.103$ billion
- Abandonment: Abandoning this investment currently would allow Disney to recover only $ 500 million of its original investment.
- Abandonment value of DCA = $ 500 million
- Expansion: The up-front cost of $ 600 million will lead to more visitors in the park and an increase in the existing cash flows from $ 50 to $ 80 million.
- Value of CF from expansion = $\frac{\text{Increase in CF next year}}{\text{(Cost of capital - g)}} = \frac{30(1.02)}{(.0662 - .02)} = \$662$ million

FIRST PRINCIPLES

