Narrative and Numbers Workshop

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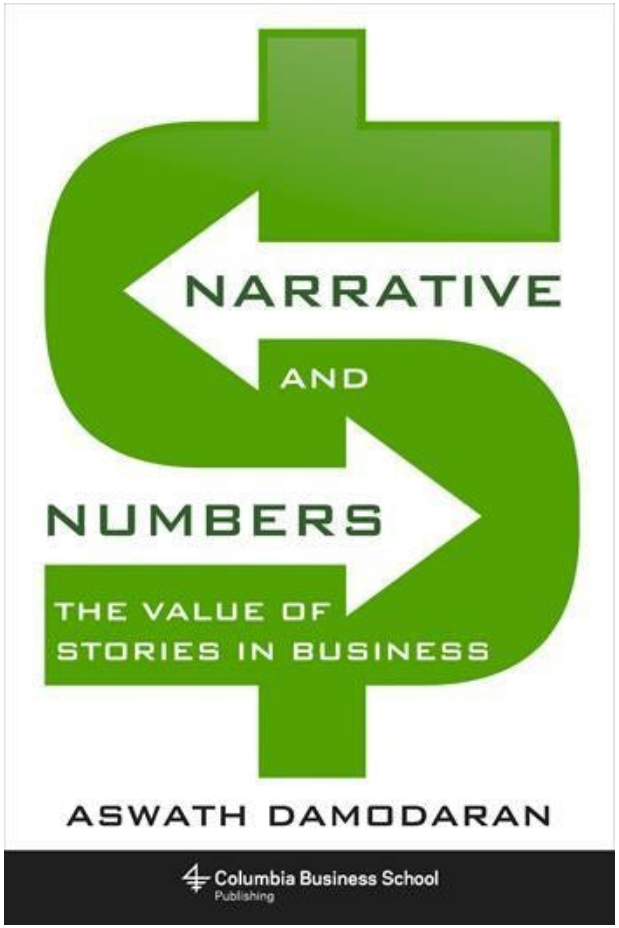
Narrative and Numbers

The Value of Stories in Business

- How can a company that has never turned a profit have a multibillion dollar valuation? Why do some start-ups attract large investments while others do not?
- Aswath Damodaran, finance professor and experienced investor, argues that the power of story drives corporate value, adding substance to numbers and persuading even cautious investors to take risks.
- In business, there are the storytellers who spin compelling narratives and the number-crunchers who construct meaningful models and accounts. Both are essential to success, but only by combining the two, Damodaran argues, can a business deliver and sustain value.



Module 1: Apple Inc. Valuation

AAPL Valuation

Apple's Earnings Call on April 23, 2014

- Increase dividends
- Add to its stock buyback program
- Split its stock
- Stock up more than 13% from its close before the report.

What exactly did we learn about Apple in the report that we did not know already? Is the price rise merited? After the post-report price jump, is Apple fully priced?

AAPL Valuation

Changes in the Gap between Intrinsic Value and Market Price

- **January 2011 – July 2012: Overcoming Scale**
  - Intrinsic Value: $377 → $682
  - Market Price: $350 → $600
  - With the market capitalization exceeding $500 billion and cash balance exceeding $100 billion, AAPL's intrinsic value continued to climb, reflecting Apple's success in overcoming scale, i.e., managing revenue growth and margins, in spite of its size.

- **Up to September 2012: Momentum Play to Pricing Peak**
  - Intrinsic Value: $639
  - Market Price: $667
  - the stock price exceeded intrinsic value estimate and that represented the pricing peak

- **April 2013: Margin Squeeze**
  - Intrinsic Value: $595
  - Market Price: $385
  - The lower revenue growth and margin pressure reduced the intrinsic value and market price. (creating a percentage under valuation of more than 25%).

AAPL Valuation

Changes in the Gap between Intrinsic Value and Market Price

- **January 2014 – April 2014**
  - Intrinsic Value: $627 → $675 / share
  - Market Price: $500 → $565 / share
  - There has been an increase in intrinsic value, partly because of improvements in market mood (a lower equity risk premium) and partly because of reduced share count (due to Apple's buybacks).
  - The price-value gap has closed a little since April 2013, albeit in fits and starts, with the gap standing at about 19.6% just before the last earnings report.

- **April 2014: Closing the Pricing Gap**
  - Apple tries to narrow the pricing gap by utilizing non-value measures, such as increase in dividends, larger stock buyback program, and stock split.

- **June 2014 – Present**
  - Gap has been largely closed

Valuation Model

10-Year Discounted Cash Flow Analysis (AAPL)

Period	Base Period	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Terminal
Revenue growth rate		4.0%	4.0%	4.0%	4.0%	4.0%	3.6%	3.2%	2.8%	2.4%	2.0%	2.0%
Revenues	$212.16	$220.65	$229.48	$238.66	$248.20	$258.13	$267.40	$275.90	$283.54	$290.23	$295.89	$301.66
EBIT (margin)	31.7%	31.0%	30.4%	29.7%	29.0%	28.4%	27.7%	27.0%	26.3%	25.7%	25.0%	25.0%
EBIT (income)	$67.28	$68.49	$69.69	$70.88	$72.05	$73.20	$74.03	$74.53	$74.69	$74.51	$73.97	$75.42
Tax Rate	26.9%	26.9%	26.9%	26.9%	26.9%	26.9%	28.7%	30.5%	32.4%	34.2%	36.0%	36.0%
EBIT(1-t)	$49.18	$50.06	$50.94	$51.81	$52.66	$53.50	$52.76	$51.77	$50.52	$49.04	$47.34	$48.27
- Reinvestment		$4.24	$4.41	$4.59	$4.77	$4.96	$4.63	$4.25	$3.82	$3.35	$2.83	$7.84
FCFF		$45.82	$46.53	$47.22	$47.89	$48.54	$48.13	$47.51	$46.70	$45.69	$44.51	$40.42
NOL		$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
WACC		8.6%	8.6%	8.6%	8.6%	8.6%	8.5%	8.3%	8.2%	8.1%	8.0%	8.0%
Discount factor		0.9211	0.8485	0.7816	0.7199	0.6632	0.6115	0.5644	0.5215	0.4824	0.4467	
PV(FCFF)		**$42.21**	**$39.48**	**$36.90**	**$34.48**	**$32.19**	**$29.43**	**$26.82**	**$24.36**	**$22.04**	**$19.88**	

Note: Currency in $USD billions.

Valuation Model

10-Year Discounted Cash Flow Analysis (AAPL)

Terminal cash flow	$40.42
Terminal cost of capital	8.00%
Terminal value	$668.15
PV(Terminal value)	$298.44
PV (CF over next 10 years)	$307.78
Sum of PV	$606.22
Value of operating assets =	$606.22
- Debt	$48.26
- Minority interests	$0.00
+ Cash	$172.54
+ Non-operating assets	$0.00
Value of equity	$730.50
- Value of options	$0.24
Value of equity in common stock	$730.26
Number of shares	5,762.00
Estimated value / share	**$126.74**
Price	$123.25
Price as % of value	97.25%

Note: Currency in $USD billions, except for share price.

AAPL Intrinsic Value Vs. Market Price

Quick Revaluation Using the Column-wise Model

Date of Valuation	Q2 '15	Q1 '15	Q4 '14	Q3 '14	Q2 '14	Q1 '14	Q4 '13	Q3 '13	Q2 '13	Q1 '13	Q4 '12	Q3 '12
Market Price / Share	$123.25	$129.09	$100.75	$95.00	$80.71	$80.71	$71.43	$72.28	$59.71	$72.80	$72.86	$83.43
Intrinsic Value / Share	$126.74	$117.23	$103.58	$96.61	$96.33	$96.43	$89.56	$86.68	$83.39	$82.14	$87.03	$94.49
Price as % of Value	97.0%	110.0%	97.0%	98.0%	84.0%	84.0%	80.0%	83.0%	72.0%	89.0%	84.0%	88.0%

AAPL Intrinsic Value Vs. Market Price

Value vs. Price Comparison Graph (3Q 2012 - 2Q 2015)

Module 2: CEO Valuation – Microsoft (MSFT)

Valuing the Top Managers

Introduction

- CEO pay has been increasing at rates far higher than pay for those lower in the pay scale, for much of the last three decades. Since 1992, the annual compounded increase in CEO pay of 7.64% has been higher than the growth in revenues, earnings or other profitability measures.
  1. CEOs were paid more this year than they were last year, with collective pay increasing about 12.1% at the largest companies.
  2. The portion of that compensation that was in cash increased to 37% from 35% in the prior year, with the bulk of the remaining coming from stock grants (31%) and options (23%); pension gains (6%) and perks (2%) rounded out the rest.
  3. The highest paid CEO in 2014 was Nick Woodman, CEO of GoPro, who was granted 4.5 million restricted stock units, valued at $284.5 million.

- Can a CEO really be worth tens or even hundreds of millions of dollars in annual compensation?

Valuing the Top Managers

Determinants of CEO Pay (Rational)

- **Reward for performance:** If a CEO is paid to run a company, he or she should do well when the company does well. You can measure "doing well" on three dimensions:
  1. *Profitability*: Higher profits (and growth in those profits)
  2. *Quality of the profitability*: Profit margins and returns on invested capital
  3. *Market measure of performance*: Superior stock returns (either in absolute terms or relative to the market or the sector)

- **CEO Market:** With the preposition that it takes a *unique skill set* to become a CEO and that there is a *market for CEOs*, the compensation package that the company negotiates with a CEO will be determined by how the market prices his or her skills.

- **CEO Power:** If a *CEO is powerful*, he or she may be able to get a pay package (from a captive board). Factors that determine CEO power include:
  - *His or her stock ownership:* Ownership of controlling stakes (and control does not require 50%+)
  - *Corporate governance:* Weak or compliant boards of directors and little accountability to shareholders
  - *CEO tenure*

Valuing the Top Managers

Determinants of CEO Pay (Irrational)

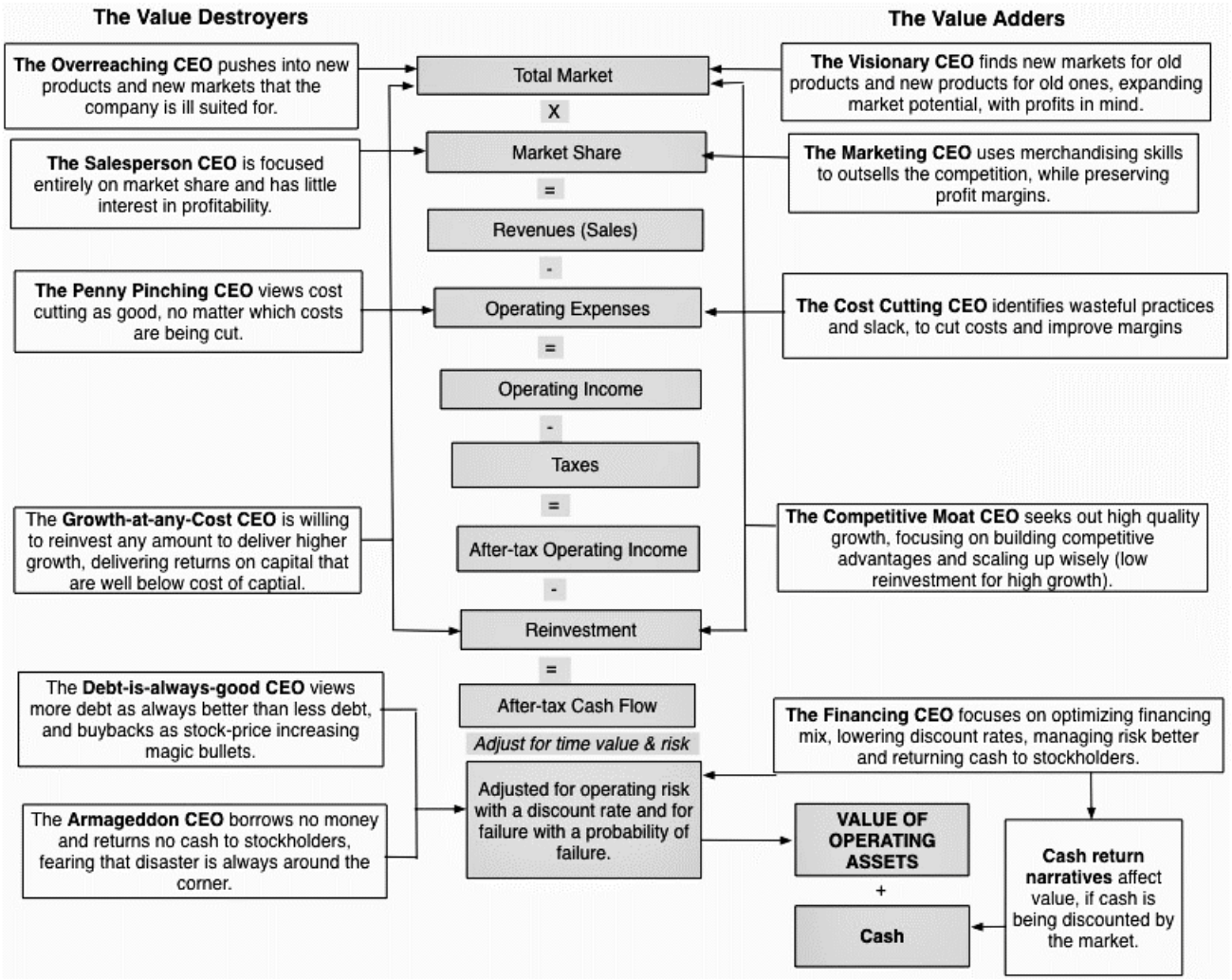
- **The Stock Compensation Delusion:** The delusion that stock-based compensation is cheap or even costless seems to be widespread among accountants, analysts and companies.

- **The Momentum Game:** Companies set CEO pay based on what other companies in their peer group do (a subjective grouping to begin with). In this case, all it takes is one company over-paying its CEO to set off overpayments across the entire sector.

- **The Celebrity CEO:** Some celebrity CEOs are more interested in developing superstar status than in managing the companies they are put in charge of, and boards are willing to pay premium prices (in pay packages) to attract them.

Valuing the Top Managers

A Framework for analyzing the value added by a CEO



Valuing the Top Managers

Auto CEO vs. CEO in Question

- Valuing a CEO requires an understanding of how that CEO plans to change the company and quantification of the effects. Thus, to measure the impact of a CEO on a company's value, the company needs to be valued twice, once with an ***Auto CEO*** and the other with the ***CEO in Question***.

Auto CEO

The company will continue to do what it has done historically in terms of market focus, marketing strategies, risk profile, etc.

VS

CEO in Question

The CEO will make changes in the company that affect the market focus, marketing strategies, risk profile, etc.

Valuing the Top Managers

Valuing MSFT CEO: Satya Nadella

- Satya Nadella, Microsoft's CEO, was the highest paid CEO last year ($84 million)
- If Mr. Nadella can slow the slide in margins, he will be able to add $7.74 billion in value to the company (about 2.25% of the company's value) – *Refer to MSFT Valuation Model***

	Auto-CEO	Mr. Nadella	Difference
Equity Value	$411.44B	$419.18B	$7.74B
Value Per Stock	$50.71	$51.67	$0.96

- Although Mr. Nadella's compensation package seems to be extremely large in absolute terms, it seems to be justified given the amount of value that he adds to Microsoft.
- This framework enables users to make judgments on the types of companies that CEOs are most likely to make a difference, in good or bad ways.

Valuing the Top Managers

Companies where the CEO makes the biggest impact on value

- **Macro vs. Micro firms:** A CEO has a bigger impact in companies where value is more determined by micro factors (markets targeted, pricing policies etc.) than at companies whose value is driven primarily by macro forces (commodity prices, exchange rates, interest rates).

- **Market and Competition:** A CEO has bigger impact on value in companies that operate in competitive businesses by finding and maintaining a competitive edge.

- **Life Cycle:** A CEO has a higher percentage effect on value early in the life cycle by:
  - Defining potential markets
  - Setting a coherent and consistent vision

- **Small vs. Large firms:** A CEO has a higher impact on value in absolute terms than at a small firm, simply because the effects of small operating changes in the company can translate into large absolute changes in value.

Valuing the Top Managers

Value of CEO at Different Companies

- The skill set and qualities that make for a value-adding CEO will vary across companies:

Start-up	Mature Company	Declining Company
- Imagination, - Charisma, and - Narrative skills	- Knowledge of capital markets and - Understanding of sector dynamics	- Ability to deal with slipping revenues and shrinking margins, - Ability to manage the return of cash to stockholders and lenders

Module 3: Facebook IPO & WhatsApp Acquisition Valuation

Pre-IPO Overview

Pre-IPO Financials

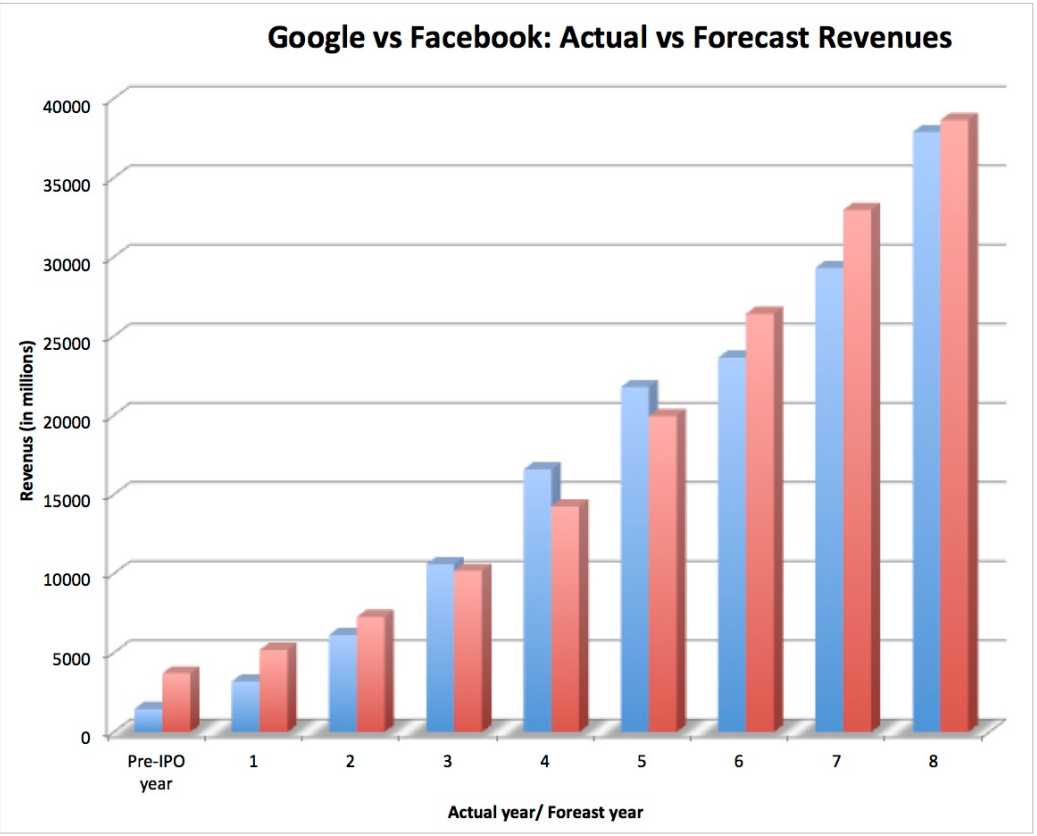
- Revenues in 2011 were $3,711 million, up 88% from 2010, which were up 150% from 2009.
- Facebook's pre-tax operating income increased from $1,032 million in 2010 to $1,756 million in 2011 (increased by 70%).
- The company is primarily equity funded, the only debt on the books was $398 million in capital leases. The total debt is $1,174 million accounting for operating lease commitments of $776 million.

(In $USD Millions)	**2009**	**2010**	**2011**
Revenue	$777	$1,974	$3,711
Pre-tax Operating Income	$262	$1,032	$1,756
Operating Margin	33.7%	52.3%	47.3%
Net Income	$229	$606	$1,000
Profit Margin	29.5%	30.7%	26.9%
Book Value of Equity	$868	$2,162	$5,228

Valuation Assumptions

Future Revenues

- Facebook is on a "high growth" path, the question is how that growth rate will continue as it scales.
- We estimated a compounded revenue growth rate of 40% for the next five years and a scaling down of that growth rate to the nominal growth rate in the economy (set equal to the risk free rate of 2.01%) by the end of ten years.
- We assumed Facebook will follow a revenue growth path close to Google's over the next 8 years, as evidenced in the chart – comparing Google's actual revenues in the 8 years since their IPO with Facebook's forecasted revenues for the next 8 years.

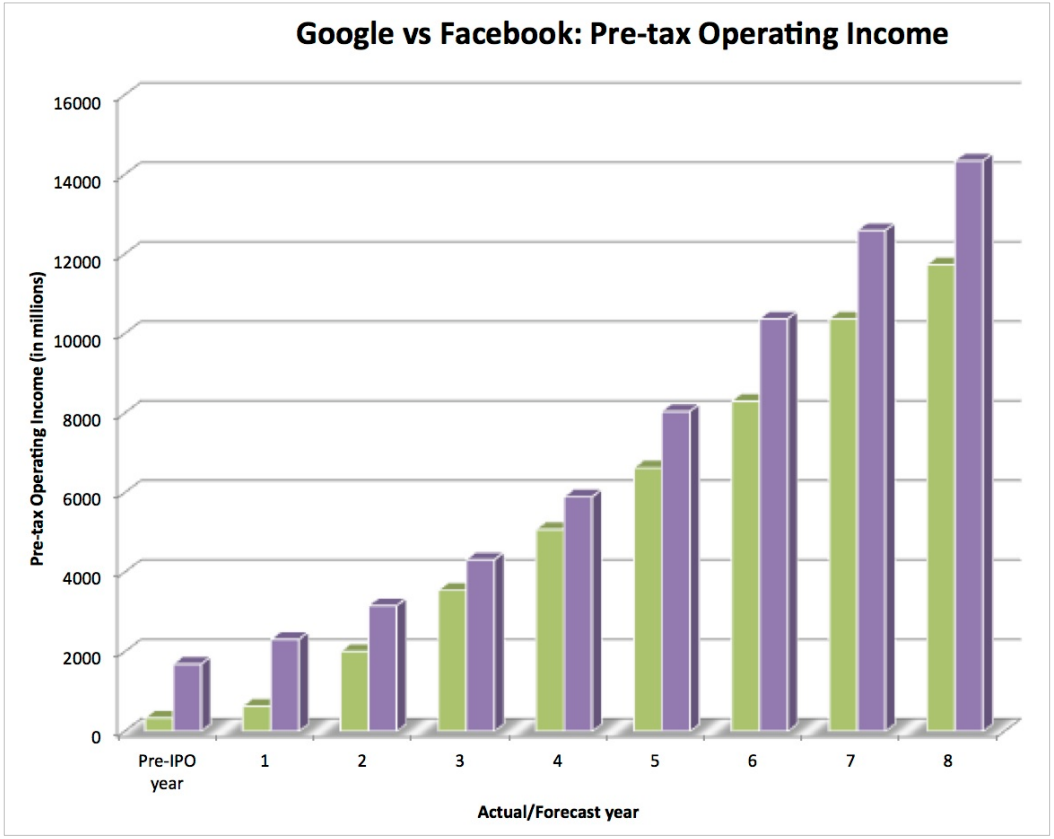


Blue – Google (Actual)
Red – Facebook (Forecast)

Valuation Assumptions

Future Operating Margins

- Facebook has a phenomenal pre-tax operating profit margin in excess of 45%.
- To provide a contrast, Google's operating margin is currently about 31% and has seldom exceeded 35%.
- However, Facebook's margins will come under pressure as they actively seek out more revenues and I am assuming that the pre-tax margin will decrease to 35% over the next decade.
- Even with this assumption, I am estimating operating income for Facebook will exceed Google's by a wide margin over the 8 years following the IPO.



Green – Google (Actual)
Purple – Facebook (Forecast)

Valuation Assumptions

Reinvestment

- Growth for Facebook does not come for free:
  - The company had net capital expenditures of $283 million, an acquisition that cost $24 million and an increase in capital leases of about $480 million.
  - To estimate reinvestment in future years, we assumed that the firm would be able to generate about $1.5 million in revenues for every million in additional capital investment.
  - By looking at Google over the last few years as the company has moved increasingly to using acquisitions to augment growth, we are estimating that Facebook will generate a return on its capital of about 32% in year 10, up from just over 26% now.

Cost of Capital

- Facebook is a company that is funded almost entirely with equity and while it is a young, growth company, it does have a business model that is working and delivering substantial profits.
- Using a simpler approach looking across the costs of capital of all US companies at the start of 2012, we estimate a cost of capital of 11.42% for advertising companies.
- We assume that Facebook will face a similar cost of capital to start. The median cost of capital for US companies is roughly 8% and as Facebook grows and matures, adjusting the cost of capital down to 8% over time.

Valuation Summary

Value of Equity

- The assumptions above are sufficient to estimate the value of the operating assets. Discounting the cash flows back at the cost of capital (with changes over time) results in a value of $71,240 million.

Discounted Cash Flow	$71,240
+ Cash	$1,512
- Debt	$1,174
Value of Equity	**$71,578**

Value Per Share

- **Equity options:** There are 138.54 million options outstanding, from earlier year compensation schemes, with an average maturity of about 2 years and an exercise price of $0.75.
  - Value in shares = $71,578 million - $3,782 million (estimated value of options) = $67,795 million
- **Restricted Stock Units:** There are 380.719 millions class B shares, in restricted stock units, that will eventually become regular shares and hence added to current shares outstanding.
- **Class A and Class B shares:** After the IPO, there will be 117.097 million Class A shares (with one voting right per share) and 1758.902 million Class B shares (with ten voting rights per share).
- The value per share arrived is $29.05 accounting for the above. Allowing for a slight discount (3-5%) on the non-voting shares, the class A shares in the IPO will have a value of ~$28.

WhatsApp Acquisition

Valuation Perspectives

- The WhatsApp Acquisition price of $19B paid by Facebook can be evaluated from three different perspectives

1. An investor's perspective, which looks at how much fundamental value will be added to Facebook by acquiring WhatsApp
2. A trader's perspective which looks at the pricing of technology firms on different pricing metrics
3. A corporate strategy perspective, which looks at the value of pre-emptively acquiring WhatsApp before Google does

WhatsApp Acquisition

Valuation Perspective #1: Investor (Value)

- To justify a $19 billion value for a company in equity markets today, you would need that company to generate about $2.2 billion in pre-tax income in steady state. (Assuming 8% cost of capital and 30% tax).

There are three pathways for WhatsApp to deliver these break-even earnings:

1. Charge the users a dollar a year (99 cents) and incur zero operating costs. This option requires about 2.5 billion people using the app on a continuing basis.
2. Charge $5/year to the existing user base of 450 million and not lose customer. Charge more to pay for expenses.
3. Make $2.2 billion in terms of advertising revenues to either directly advertising to Whatsapp's users in the app or drawing them into the Facebook ecosystem and advertising to them there.

WhatsApp Acquisition

Valuation Perspective #2: Trader (Pricing)

- In terms of pricing tech companies, number of users is the dominant driver: The key variable in explaining differences in value across companies is the number of users.
  - Zillow saw its stock price climb 12% in February, 2014, primarily on the news that they added more users than expected.
  - Twitter seeing its stock price drop 25% in February 2014, again primarily on news that the user base grew less than expected.

1. User engagement matters: The value per user increases with user engagement. Put different, social media companies that have users who stay on their sites longer are worth more than companies where users don't spend as much time.
2. Predictable revenues are priced higher than more diffuse revenues: Some of the tech companies derive revenues entirely from advertising, some from a mix of advertising and subscriptions and some from just subscriptions. While the sample is too small to draw strong conclusions, the value per user of $577 attached to Netflix's users suggests that the market values predictable subscription revenues more than uncertain advertising or retail revenue.
3. Making money is a secondary concern (at least for the moment): There is a correlation between how much a company generates in revenues and its value, and even one between how much money it makes (EBITDA, net income) and value. However, they are less related to value than the number of users.

WhatsApp Acquisition

Valuation Perspective #3: Defensive

- Supposed a company (A) has annual cash flow of $10 million and cost of capital of 10%. The company value is simply calculated as $100 million. Suppose there is a young company that has a product that has no revenues right now, but if allowed to develop or in the hands of a competitor, could eat into Company A's market and lower its after-tax cash income to $ 6 million. Even though company B has little income potential on its own, company A should be willing to pay up to $40 million to acquire it.

- Necessary Requirements for Defensive Acquisition

1. The business being defended is worth defending: Acting in defense of a business makes sense only if that business is a good one, and the measure of a good business is whether it generates returns on invested capital that exceed the cost of funding that business.
2. The threat is real, not imaginary: Spending preemptively to ward off a threat makes sense only if the revenue loss/ margin decline that is anticipated is real and is not just in the fevered imagination of the top management.
3. The pre-emptive action is the most efficient (and cheapest) way to ward off the threat: Even if the threat is to a valuable business and is imminent, there may be less expensive and simpler ways to deal with the threat then the chosen action. E.g. acquisition of a key technology / exclusive licensing rights.
4. The threat is unique and not easily recreated: Spending money to eliminate a potential threat makes sense only if the threat is unique and not replicated easily/quickly. If the threat can be replicated easily, the spending company will find itself repeatedly spending larger and larger amounts of its depleting stock to make subsequent threats go away.