

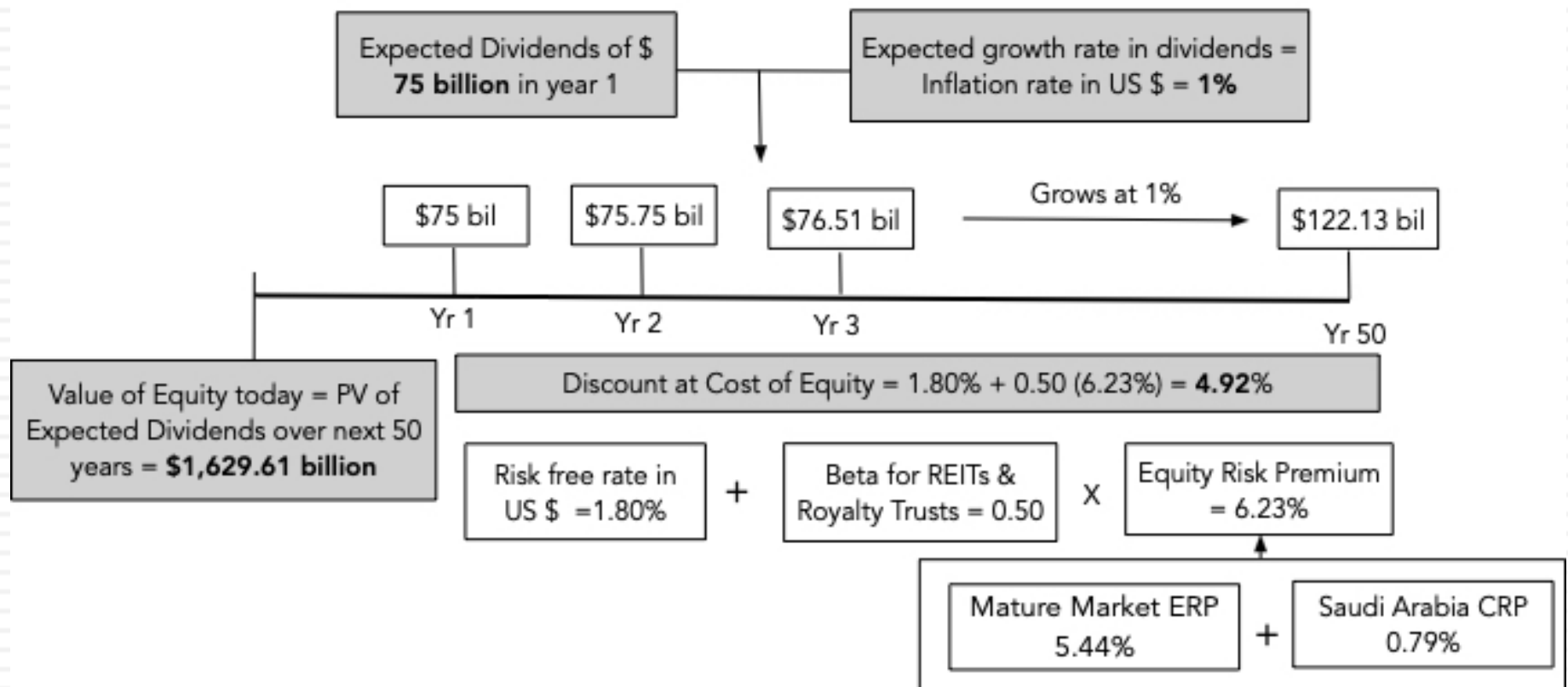
## Lesson 5: Truncation risk can come in many forms...

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- Natural disasters: Small companies in some economies are much exposed to natural disasters (hurricanes, earthquakes), without the means to hedge against that risk (with insurance or derivative products).
- Terrorism risk: Companies in some countries that are unstable or in the grips of civil war are exposed to damage or destruction.
- Nationalization risk: While less common than it used to be, there are countries where businesses may be nationalized, with owners receiving less than fair value as compensation.

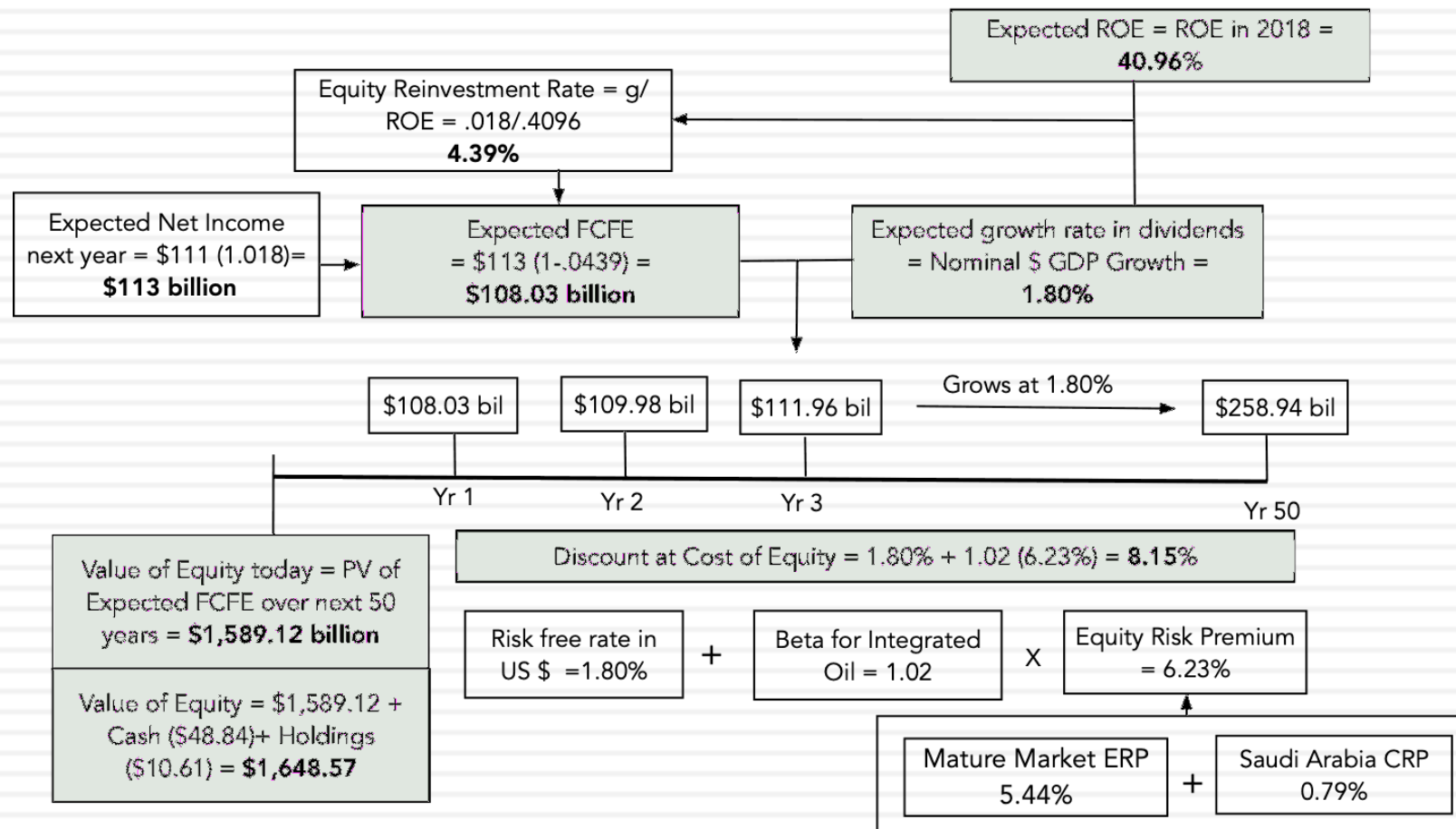
# Valuing Aramco: Promised Dividends

## A Dividend Discount Model Valuation of Aramco



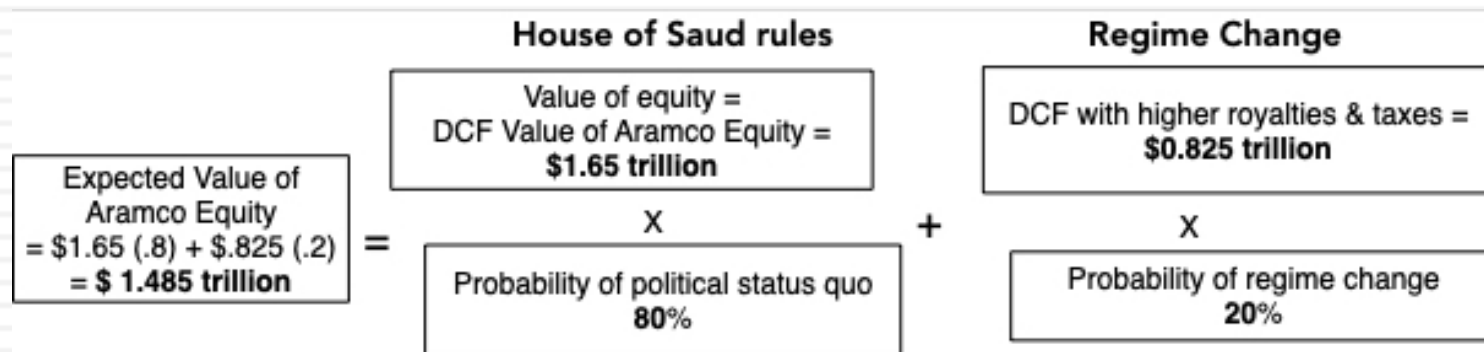
# Valuing Aramco: Potential Dividends

## A Potential Dividend (FCFE) Discount Model Valuation of Aramco



# Adjusting for regime change

- If you believe that there is no chance of regime change, your expected value will remain \$1.65 trillion.
- If you believe that regime change is imminent, and that your equity will be fully expropriated, your expected value will be zero.
- If you believe that there remains a non-trivial chance (perhaps as high as 20%) that there will be a regime change and that if there is one, there will be changes that reduce, but not extinguish, your equity claim:



# V. Valuing Financial Service Companies

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

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

What is the value added by growth assets?

What are the cashflows from existing assets?

*Preferred stock is a significant source of capital.*

What is the value of equity in the firm?

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

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

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

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

# CIB Egypt in December 2015

## Valuation in Egyptian Pounds

ROE = 42.48%

Retention  
Ratio =  
75.25%

**Expected Growth**  
75.25% \*  
42.48% = 31.96%

### Dividends

EPS = 4.04 EGP  
\* Payout Ratio 24.75%  
DPS = 1.00 EGP

g = 10%: ROE = 25% (= Cost of equity)  
Beta = 0.81  
Payout = (1 - 10/25) = .60

|                           | 1        | 2        | 3        | 4         | 5         | 6         | 7         | 8         | 9         | 10        |
|---------------------------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Expected Growth Rate      | 31.96%   | 31.96%   | 31.96%   | 31.96%    | 31.96%    | 27.57%    | 23.18%    | 18.79%    | 14.39%    | 10.00%    |
| Earnings per share        | 5.33 ج.م | 7.04 ج.م | 9.28 ج.م | 12.25 ج.م | 16.17 ج.م | 20.63 ج.م | 25.41 ج.م | 30.18 ج.م | 34.52 ج.م | 37.97 ج.م |
| Payout ratio              | 24.75%   | 24.75%   | 24.75%   | 24.75%    | 24.75%    | 31.80%    | 38.85%    | 45.90%    | 52.95%    | 60.00%    |
| Dividends per share       | 1.32 ج.م | 1.74 ج.م | 2.30 ج.م | 3.03 ج.م  | 4.00 ج.م  | 6.56 ج.م  | 9.87 ج.م  | 13.85 ج.م | 18.28 ج.م | 22.78 ج.م |
| Cost of Equity            | 23.25%   | 23.25%   | 23.25%   | 23.25%    | 23.25%    | 23.25%    | 23.25%    | 23.25%    | 23.25%    | 23.25%    |
| Cumulative Cost of Equity | 123.25%  | 151.90%  | 187.21%  | 230.73%   | 284.37%   | 350.48%   | 431.95%   | 532.37%   | 656.13%   | 808.66%   |
| Present Value             | 1.07 ج.م | 1.15 ج.م | 1.23 ج.م | 1.31 ج.م  | 1.41 ج.م  | 1.87 ج.م  | 2.29 ج.م  | 2.60 ج.م  | 2.79 ج.م  | 2.82 ج.م  |

**Terminal Value**  
=  $EPS_6 * Payout / (r - g)$   
=  $(37.97 * .6) / (.2325 - .10) = 189.20$

Value of Equity per  
share = PV of  
Dividends &  
Terminal value =  
41.93 EGP

Discount at Cost of Equity

Cost of Equity  
 $10.53\% + 0.81 (15.70\%) = 23.25\%$

Forever

*In December 2015, CIB  
was trading at 36 EGP  
per share*

### Riskfree Rate:

In EGP  
10.53%

US \$ risk free rate (2.27%)  
adjusted for diff inflation  
 $(1.0227) * (1.097 / 1.015) - 1$

+

0.81

x

Equity Risk Premium  
15.7%

Average Beta for Banks

100% in Egypt

# Lesson 1: Financial service companies are opaque...

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

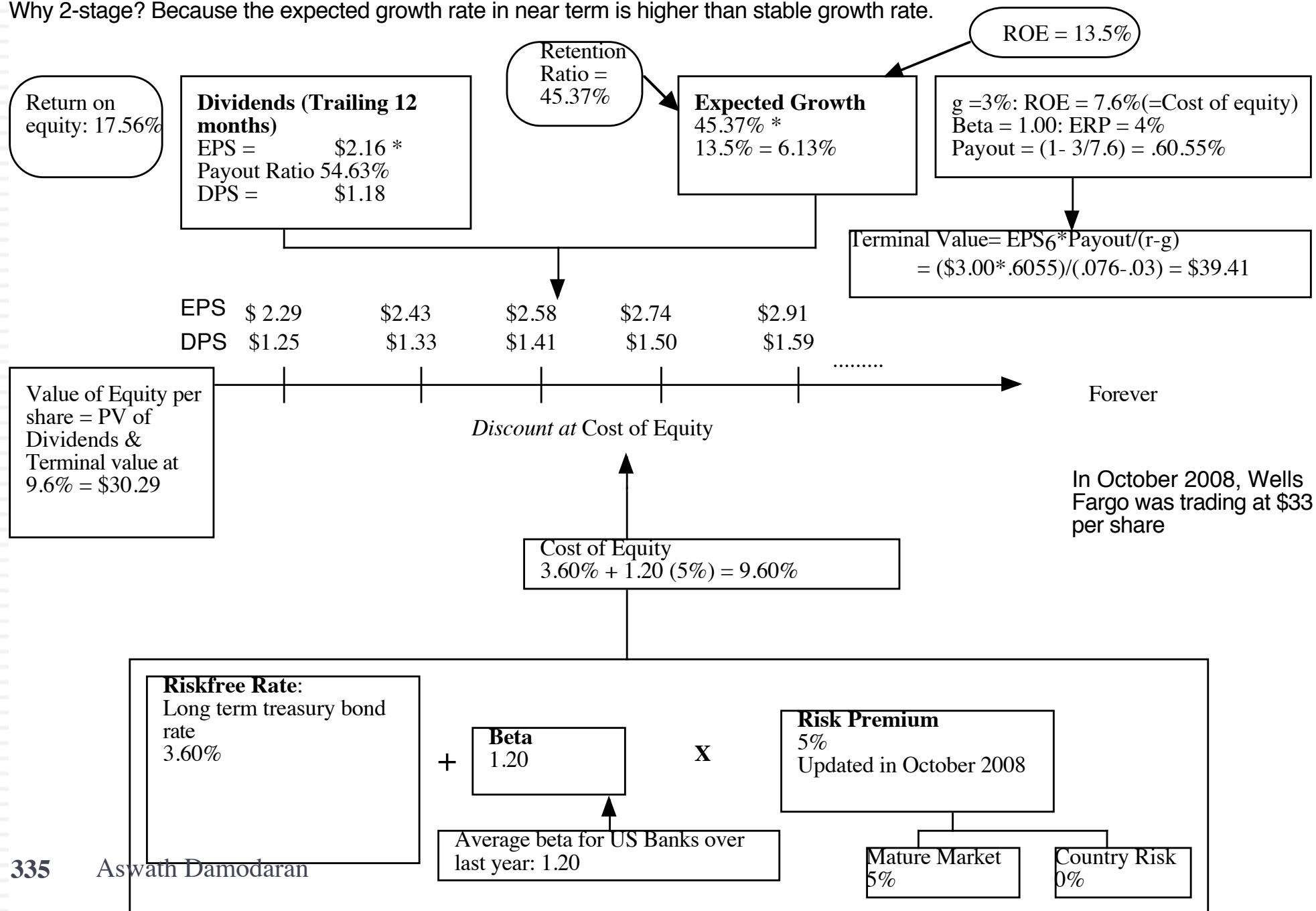
## 2c. Wells Fargo: Valuation on October 7, 2008

### Rationale for model

Why dividends? Because FCFE cannot be estimated

Why 2-stage? Because the expected growth rate in near term is higher than stable growth rate.

Assuming that Wells will have to increase its capital base by about 30% to reflect tighter regulatory concerns.  $(.1756/1.3 = .135)$





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

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

## Deutsche Bank: A Crisis Valuation (October 2016)

Risk adjusted assets grows at inflation rate of 1% a year forever.

Tier 1 capital ratio increases to 15.67%, the 75th percentile for all banks

Expected DOJ fine of \$10 billions lower Tier 1 capital today

Common Equity increases in tandem with Tier 1 capital

Cost of equity starts at 10.2% (75th percentile of banks) & decreases after year 5 to 9.44% (median across banks).

|  | Current     | 1           | 2          | 3          | 4          | 5          | 6          | 7          | 8          | 9          | 10         |
|--|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Risk Adjusted Assets   | \$ 445,570  | \$ 450,026  | \$ 454,526 | \$ 459,071 | \$ 463,662 | \$ 468,299 | \$ 472,982 | \$ 477,711 | \$ 482,488 | \$ 487,313 | \$ 492,186 |
| Tier 1 Capital Ratio   | 12.41%      | 13.74%      | 13.95%     | 14.17%     | 14.38%     | 14.60%     | 14.81%     | 15.03%     | 15.24%     | 15.46%     | 15.67%     |
| Tier 1 Capital (Risk Adjusted Assets * Tier 1 Capital Ratio) | \$55,282    | \$61,834    | \$63,427   | \$65,045   | \$66,690   | \$68,361   | \$70,059   | \$71,784   | \$73,537   | \$75,317   | \$77,126   |
| Change in regulatory capital (Tier 1)                        |             | \$6,552     | \$1,593    | \$1,619    | \$1,645    | \$1,671    | \$1,698    | \$1,725    | \$1,753    | \$1,780    | \$1,809    |
| Book Equity  | \$64,609    | \$71,161    | \$72,754   | \$74,372   | \$76,017   | \$77,688   | \$79,386   | \$81,111   | \$82,864   | \$84,644   | \$86,453   |
| Expected ROE   | -13.70%     | -7.18%      | -2.84%     | 0.06%      | 1.99%      | 5.85%      | 6.568%     | 7.286%     | 8.004%     | 8.722%     | 9.440%     |
| Net Income (Book Equity * ROE)                               | \$ (8,851)  | \$ (5,111)  | \$ (2,065) | \$ 43      | \$ 1,512   | \$ 4,545   | \$ 5,214   | \$ 5,910   | \$ 6,632   | \$ 7,383   | \$ 8,161   |
| - Investment in Regulatory Capital                           |             | \$ 6,552    | \$ 1,593   | \$ 1,619   | \$ 1,645   | \$ 1,671   | \$ 1,698   | \$ 1,725   | \$ 1,753   | \$ 1,780   | \$ 1,809   |
| FCFE   |             | \$ (11,663) | \$ (3,658) | \$ (1,576) | \$ (133)   | \$ 2,874   | \$ 3,516   | \$ 4,185   | \$ 4,880   | \$ 5,602   | \$ 6,352   |
| Terminal value of equity                                     |             |             |            |            |            |            |            |            |            |            | \$87,317   |
| Present value  |             | \$ (10,583) | \$ (3,012) | \$ (1,178) | \$ (90)    | \$ 1,768   | \$ 1,966   | \$ 2,129   | \$ 2,262   | \$ 2,370   | \$ 36,207  |
| Cost of equity   | 10.20%      | 10.20%      | 10.20%     | 10.20%     | 10.20%     | 10.20%     | 10.048%    | 9.896%     | 9.744%     | 9.592%     | 9.440%     |
| Cumulative Cost of equity                                    |             | 1.1020      | 1.2144     | 1.3383     | 1.4748     | 1.6252     | 1.7885     | 1.9655     | 2.1570     | 2.3639     | 2.5871     |
| Value of equity today =                                      | \$31,838.74 |             |            |            |            |            |            |            |            |            |            |
| Number of shares outstanding =                               | 1386.00     |             |            |            |            |            |            |            |            |            |            |
| DCF Value per share =  | \$ 22.97    |             |            |            |            |            |            |            |            |            |            |
| Probability of equity wipeout                                | 10.00%      |             |            |            |            |            |            |            |            |            |            |
| Adjusted value per share =                                   | \$ 20.67    |             |            |            |            |            |            |            |            |            |            |
| Stock price on October 3, 2016=                              | \$ 13.33    |             |            |            |            |            |            |            |            |            |            |

Value per share adjusted for probability of catastrophic failure (bailout) resulting in complete loss of equity.

Return on equity increases to 5.85% (25th percentile of banks) in year 5 and 9.44% (cost of equity) in year 10

# VI. Valuing Companies with “intangible” assets

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*If capital expenditures are miscategorized as operating expenses, it becomes very difficult to assess how much a firm is reinvesting for future growth and how well its investments are doing.*

What are the cashflows from existing assets?

*The capital expenditures associated with acquiring intangible assets (technology, human capital) are mis-categorized as operating expenses, leading to incorrect accounting earnings and measures of capital invested.*

What is the value added by growth assets?

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

*It can be more difficult to borrow against intangible assets than it is against tangible assets. The risk in operations can change depending upon how stable the intangible asset is.*

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

*Intangible assets such as brand name and customer loyalty can last for very long periods or dissipate overnight.*

# Lesson: Accounting rules are cluttered with inconsistencies...

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- If we start with accounting first principles, capital expenditures are expenditures designed to create benefits over many periods. They should not be used to reduce operating income in the period that they are made, but should be depreciated/amortized over their life. They should show up as assets on the balance sheet.
- Accounting is consistent in its treatment of cap ex with manufacturing firms, but is inconsistent with firms that do not fit the mold.
  - With pharmaceutical and technology firms, R&D is the ultimate cap ex but is treated as an operating expense.
  - With consulting firms and other firms dependent on human capital, recruiting and training expenses are your long term investments that are treated as operating expenses.
  - With brand name consumer product companies, a portion of the advertising expense is to build up brand name and is the real capital expenditure. It is treated as an operating expense.