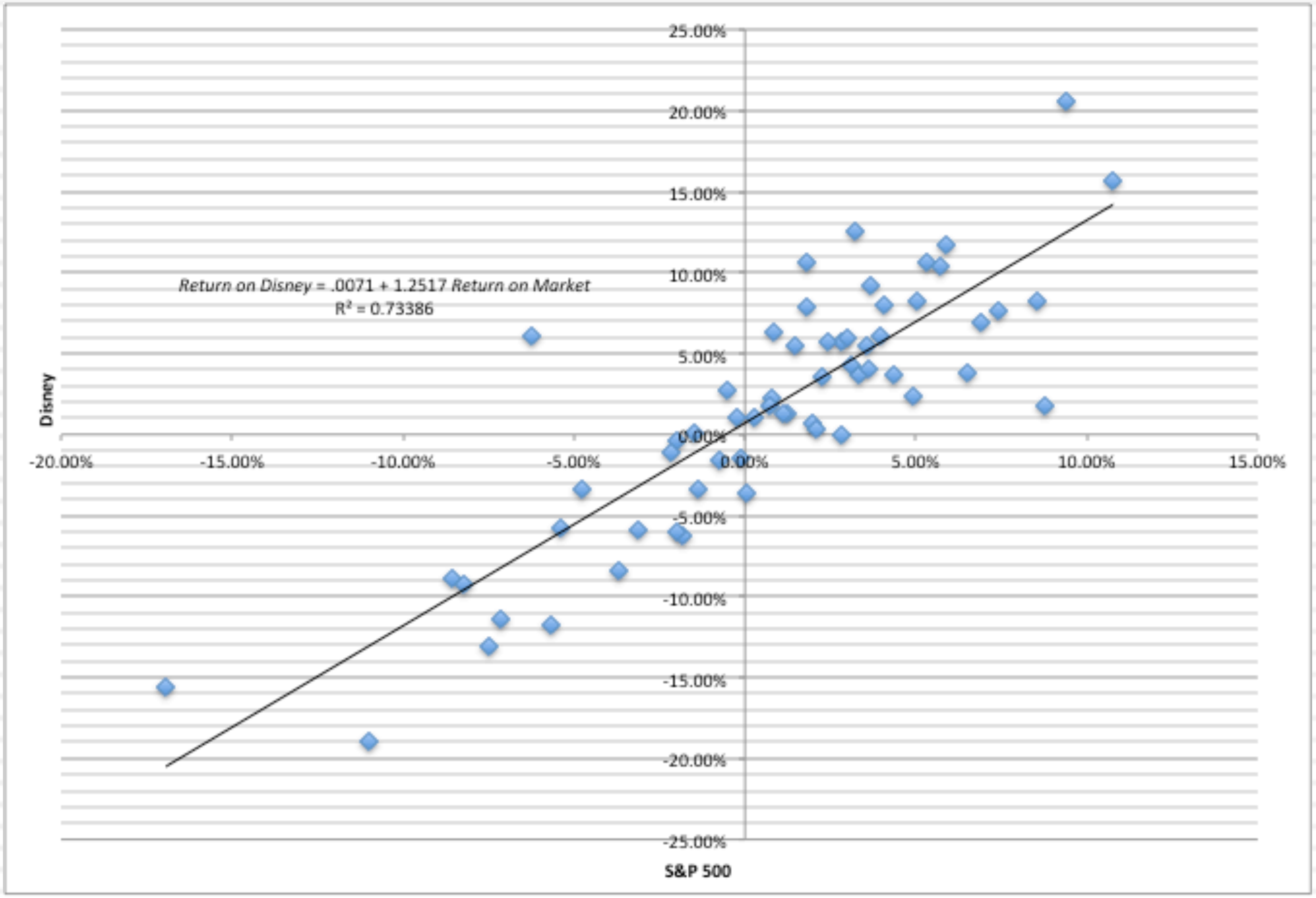
Choosing the Parameters: Disney

- 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%

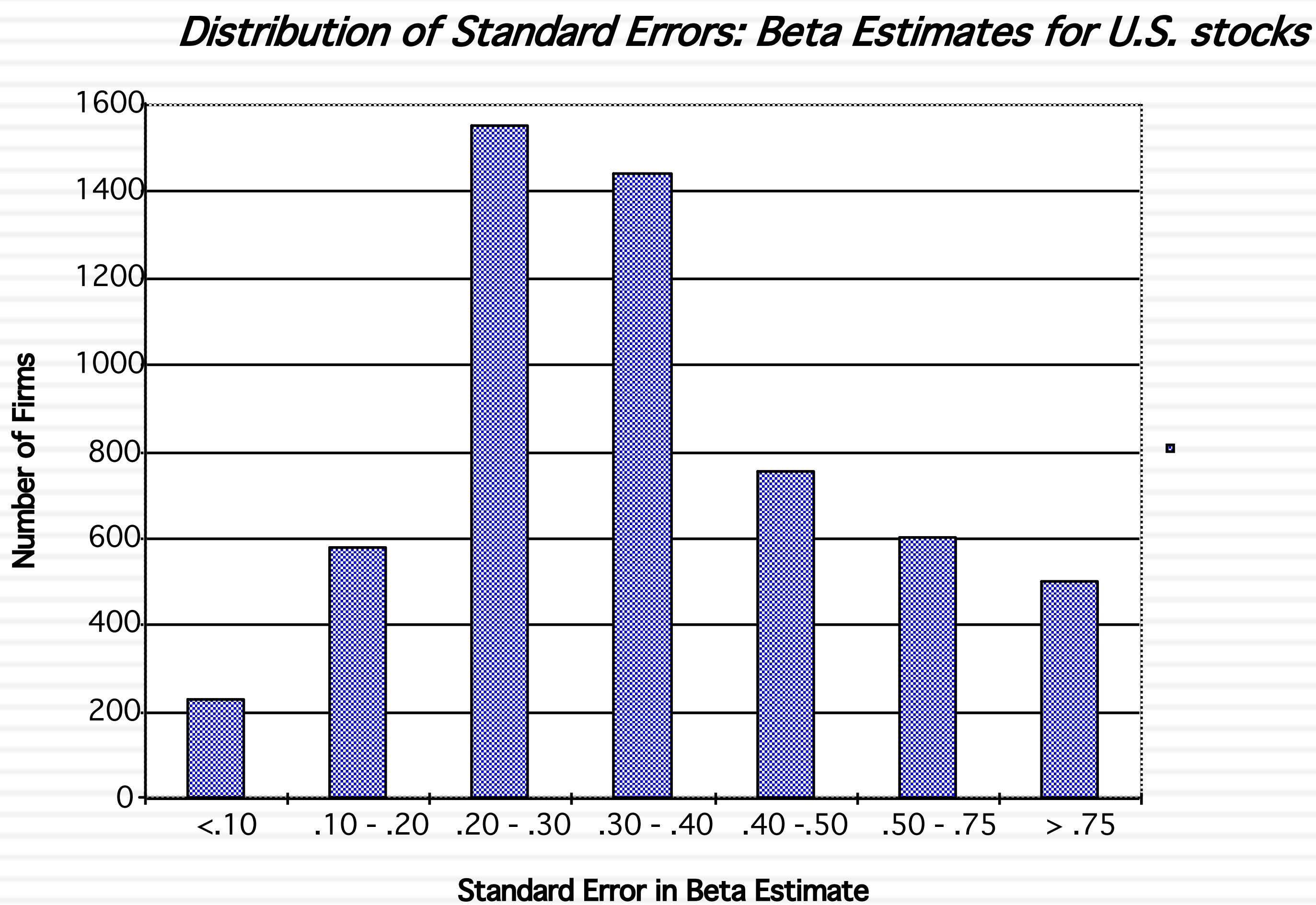
More on Jensen's Alpha

- 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"



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. Why might this be happening?

- What are the implications for investors?

The Relevance of R Squared

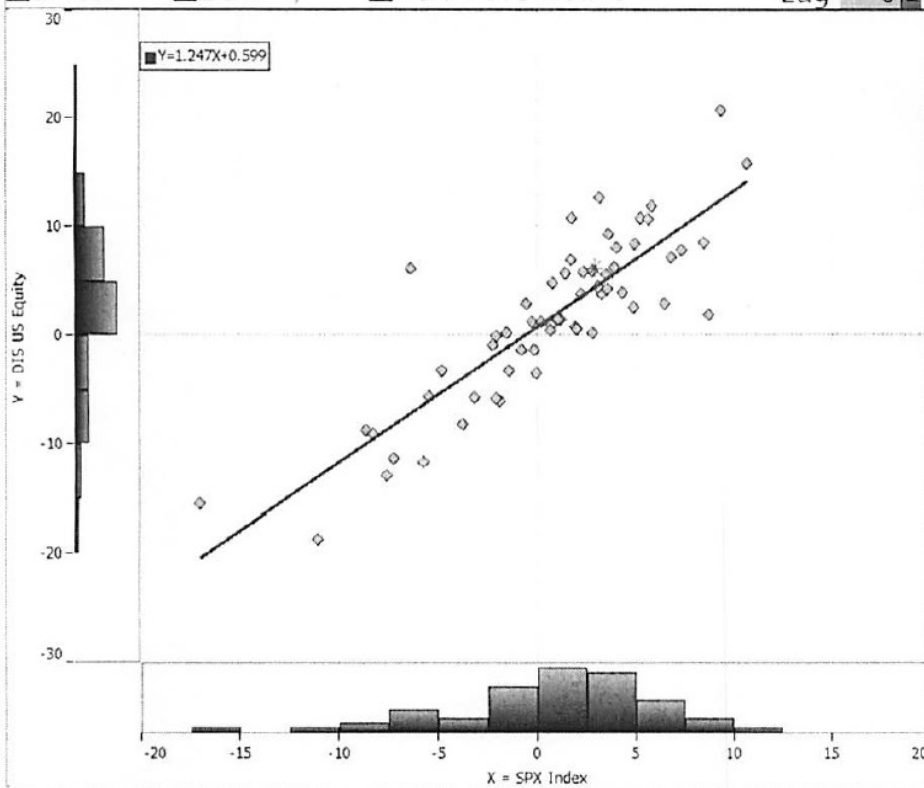
- You are a diversified investor trying to decide whether you should invest in Disney or Amgen. Boht companies have betas of 1.25, but Disney has an R Squared of 73% while Amgen's R squared is only 25%. Which one would you invest in?
  - Amgen, because it has the lower R squared
  - Disney, because it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

Beta Estimation: Using a Service (Bloomberg)

DIS US Equity | Relative Index SPX Index | Historical Beta

Data Last Price | Range 09/30/2008 - 09/30/2013 | Period Monthly | Local CUR

☑ Linear ■ Beta +/- ■ Non-Parametric Lag 0



Y = WALT DISNEY CO/THE
X = S&P 500 INDEX

Item	Value
Raw BETA	1.247
Adjusted BETA	1.165
ALPHA(Intercept)	0.599
R^2(Correlation^2)	0.734
R(Correlation)	0.857
Std Dev of Error	3.957
Std Error of ALPHA	0.516
Std Error of BETA	0.099
t-Test	12.659
Significance	0.000
Last T-Value	0.428
Last P-Value	0.665
Number of Points	60

+ Last Observation

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?
  - 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,
  - This is the return that I need to make on Disney in the long term to break even on my investment in the stock
  - 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
  - Buy the stock
  - 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?

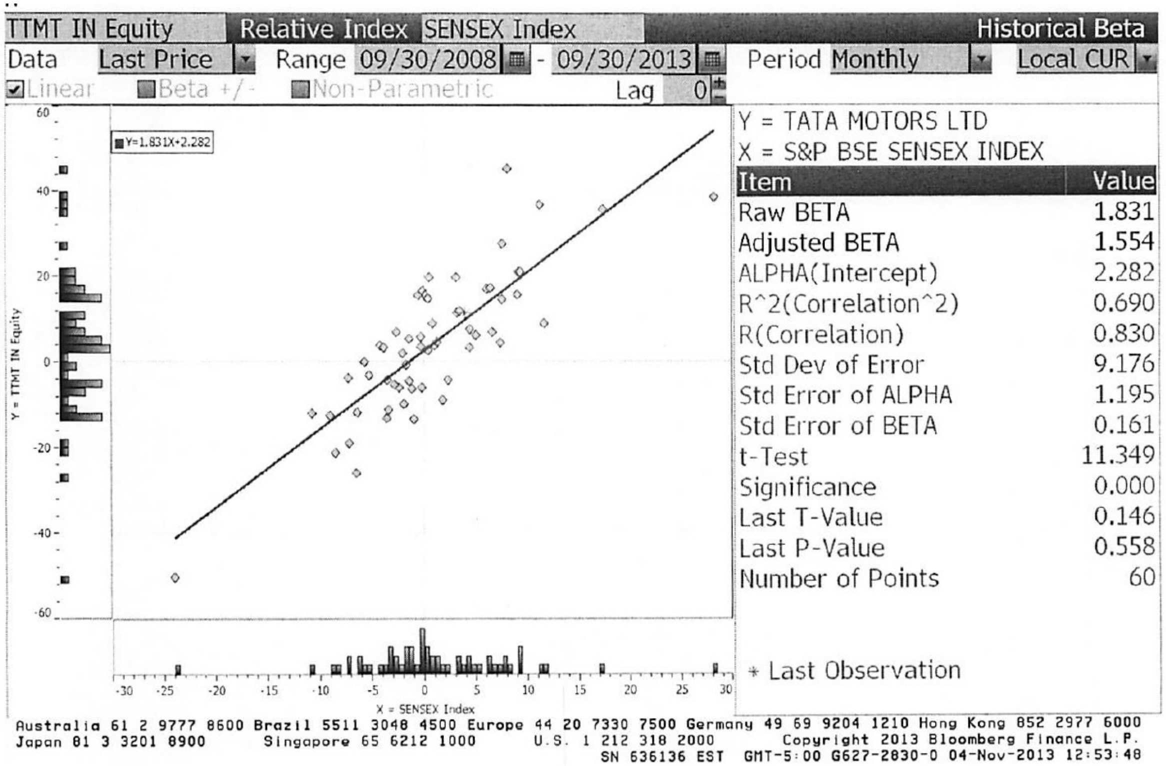
Application Test: Analyzing the Risk Regression

- 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



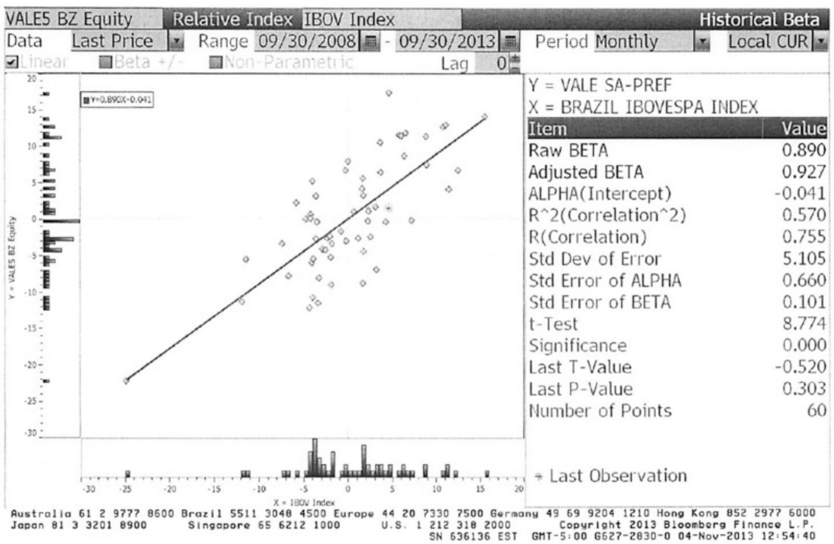
Beta = 1.83
67% range
1.67-1.99

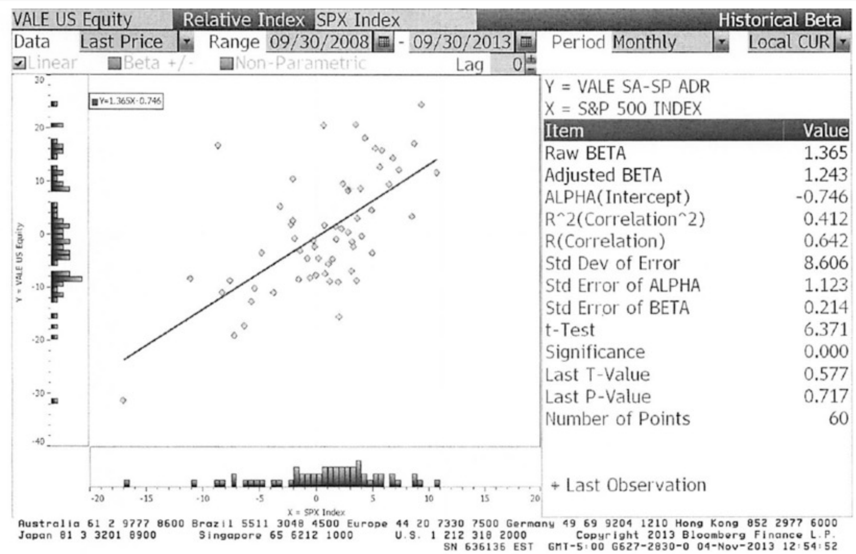
69% market risk
31% firm specific

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