

# **Class 4:**

# **Modern Finance 10-09-2013**

## **Financial axioms vs** **behavioral finance and imperfect markets;**

- **Axioms**
  - Financial markets are competitive:
  - Value additivity;
  - No Free Lunch;
  - Markets are efficient
- **Some problems with these axioms**
  - Market impact
  - IPO performance

# Two sides of Modern finance

- Both cautions to individual investors
- Efficient markets hypothesis
  - You can't beat the market except by luck
  - That you beat the market today does not increase your chances tomorrow
- Behavioral finance/imperfect markets
  - Individuals have systematic biases in how they handled financial information and decisions
  - Intermediaries have a personal profit motive that leads to systematically distort the market
  - Both problems are worst in booms and in busts
- Efficient market hypothesis, no one can beat the market,
- Imperfect markets, only insiders can beat the market

# Axioms of modern finance

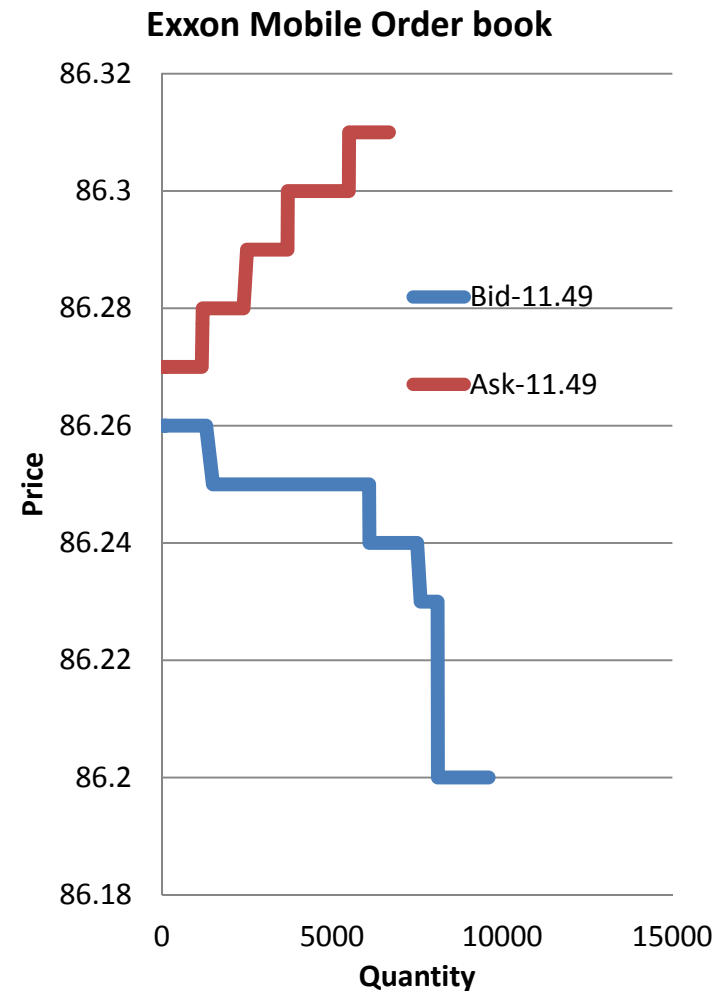
- **Financial markets are competitive**
- **Value additivity;**
- **No Free Lunch;**
- **Markets are efficient**
- **Need definitions and Look at these from three perspectives**
  - **Economics**
  - **Finance**
    - **Secondary Markets**
    - **Primary Markets**

# A1. Financial markets are competitive

- Competitive market
- Economics
  - Individual actor decisions do not matter to price (or quantity)
  - Price = marginal cost                      Profits are zero
- Finance
  - Secondary markets
    - Marginal cost is not a relevant concept
    - But if markets are competitive
      - Actors take prices as given (they do not affect price).
      - Order book is flat (net of TC)
      - No arbitrage profits
  - Primary markets
    - Investment bank fees reflect costs
- If this is true then it makes many decisions easy
  - Actors do not need (want) to be strategic. Price is the only statistic that matters

# How to interpret the order book

- Is this a violation of competition?
- Or do we need a different model?



## A2 Value additivity

- Economics
  - Given competition
  - Price of a bundle cannot be less than the price of the most expensive unit and it cannot be more than the sum of the unit prices.
  - Bounds (because there may be some economies of scale or scope)
- Finance
  - Price of a basket of securities is equal to the sum of the prices of individual contracts times the quantities
  - This is a no arbitrage condition.
  - Suppose there are  $n$  securities each with price  $p_i$
  - Let  $X$  be a portfolio  $X=\{x_1, x_i, x_n\}$  suppose the portfolio value is  $V_x$
  - Suppose  $V_x > p_1x_1 + \dots + p_1x_i + \dots + x_n p$ . Then sell the portfolio, buy the individual securities and you will make money (arbitrage).
  - Suppose  $V_x < p_1x_1 + \dots + p_1x_i + \dots + x_n p$ . Then buy the portfolio and break it up and you will make money.

# Closed End Funds

- Fund is set up with a fixed number of shares and are precursors to ETF (exchange traded funds)
- Odd thing is NAV (net asset value)
- Central Europe Russia and Turkey Fund
  - \$417 million in assets. NAV \$36.96 MP \$33.20
- Templeton Dragon Fund (China mostly)
  - \$1 Billion in assets. NAV \$29.78 MP\$26.27
- Notice that the underlying shares are not liquid so if there was to be a difference it should go the other (the fund being more liquid than the stocks)
- Notice also that if you wanted to 'correct' the market you would have to buy up the share (so you have to have deep pockets)

# A3 No Free Lunch

- Economics
  - Can't sell nothing for something
- Finance
  - Assets that has a zero payoff for certain has zero price.  
(think of the price of a bond that matures in 2014, what should you be willing to pay for it in 2015?)
  - Again this is equivalent to a no arbitrage condition.
  - Return to the VA issue with  $V_X < p_1x_1 + \dots + p_1x_i + \dots + x_n p$ . Then you buy the portfolio and break it up and make money.
  - In effect the counter party (who sells you the portfolio and then buys back the components is buying nothing on net and paying you a positive price)



# Bond Stripping

- 30 year T-Bills. Create two assets
  - A1: the interest coupons
  - A2: the final payout
- No free lunch says  $P_B B - P_1 A1(B) - P_2 A1(B) = 0$
- If true why do we create these assets?
  - And we do
- Heterogeneity in demand?
- So is No Free Lunch and aggregate statement or a marginal one?

# Financial Markets are Efficient

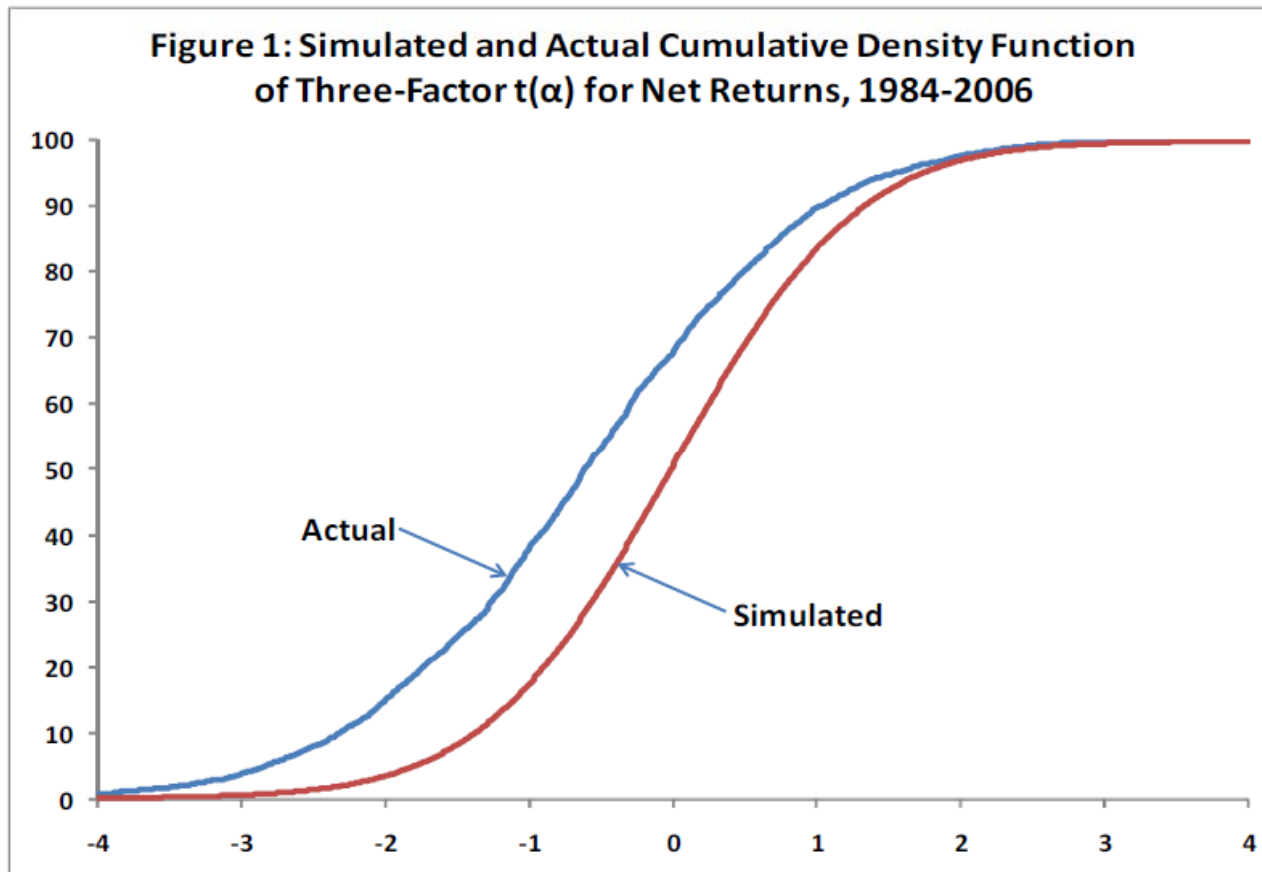
- Economics
  - A market allocation is Pareto efficient
  - You cannot find an alternative allocation that makes someone better off without making someone worse off (gains of trade have been exhausted).
    - Allocation distribution of what ever goods or services are under consideration
- Finance
  - Prices in financial markets correctly aggregate all the available information. They are the best forecast of future income flows.
  - That does not mean they correctly predict every point in the future.
  - Just that prices reflect the true distribution of future cash flow (these could be high or low but the market knows how likely they are to be high or low).
- Systematic biases offer arbitrage opportunities to those who detect them and thus they will be corrected

# Some evidence in favor of Efficiency

## Fama and French J of Fin 2010

- “In short, suppose that when returns are measured before costs (fees and other expenses), passive investors get passive [market average] returns. This means active investment must also be a zero sum game...*before* costs. If some active investors have greater than market returns *before costs*, it is dollar for dollar at the expense of other active investors. After costs, that is, in terms of net returns to investors, active investment must be a negative sum game”
- Because active investors make idiosyncratic portfolio choice some, by chance or luck, must have above market returns.

- Fama and French “use long histories of individual fund returns and bootstrap simulations of return histories to infer the existence of superior and inferior funds. We compare the actual cross-section of fund returns relative to market, *to the results from 10,000 bootstrap simulations of the cross-section. The returns of the funds* in a simulation run have the properties of actual fund returns, except we set true  $\alpha$  *to zero in the return* population from which simulation samples are drawn.
- The simulations thus describe the distribution of  $\alpha$  estimates when there is no abnormal performance in fund returns. Comparing the distribution of  $\alpha$  estimates from the simulations to the cross-section of  $\alpha$  estimates for actual fund returns allows us to draw inferences about the existence of skilled managers.
- For fund investors the simulation results are disheartening. When  $\alpha$  is estimated on net returns to
- investors, the cross-section of precision-adjusted  $\alpha$  estimates,  $t(\alpha)$ , suggests that few active funds produce benchmark adjusted expected returns that cover their costs. Thus, if many managers have sufficient skill to cover costs, they are hidden by the mass of managers with insufficient skill. On a practical level, our results on the long-term performance say that true  $\alpha$  in net returns to investors is negative for most if not all active funds, including funds with strongly positive  $\alpha$  estimates for their entire histories.”
- Note this is a necessary condition for market efficiency but not sufficient? Why?



# Implications

- If “on average at least” the axioms of finance hold  
AND
- The statistical past is the statistical future  
Then price histories are sufficient statistics for making long-term investment decisions
- There are no dollar bills on the ground
- You do not need to waste your time on research, or pay an advisor because competition has already squeezed all the profits out of the market
- You may want to use an advisor or do research because you have specific time or risk preferences

# Modern Corporate finance

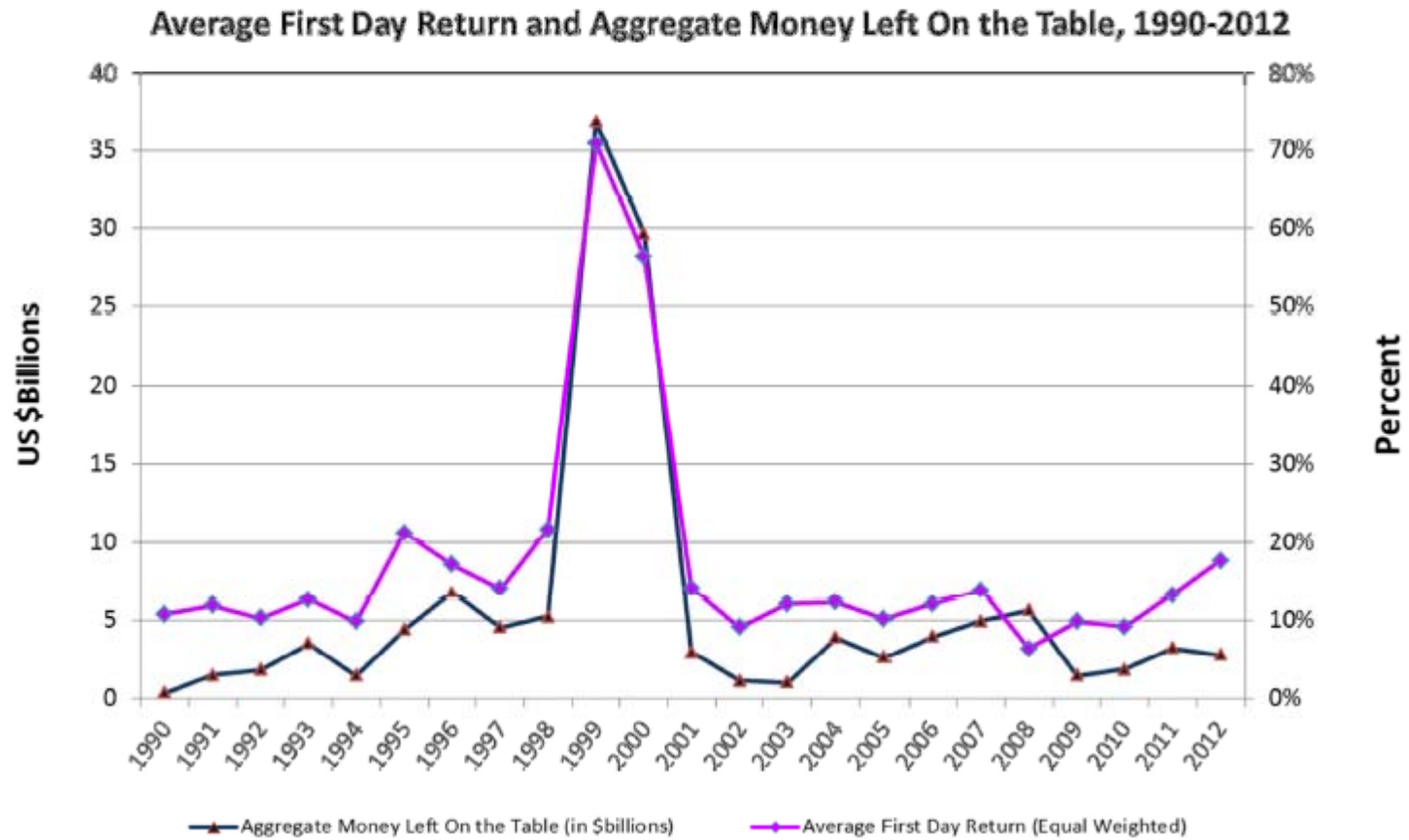
- Objective of the firm is to maximize shareholder value
  - Strategic decisions made on basis of NPV
  - Individuals who disagree just sell out
  - So no conflicts in the firm
- Debt equity structure does not matter
  - Financial structure reflects taxes and other risk preferences of insiders

# Modern finance at the IPO stage

- Recall that investment banks must choose a price for the IPO and they face uncertainty
- issuer want to minimize underpricing
- investors want to minimize overpricing
- When issuers retain a large part of the equity and control then they actually want high prices.
- Mistakes should be rare

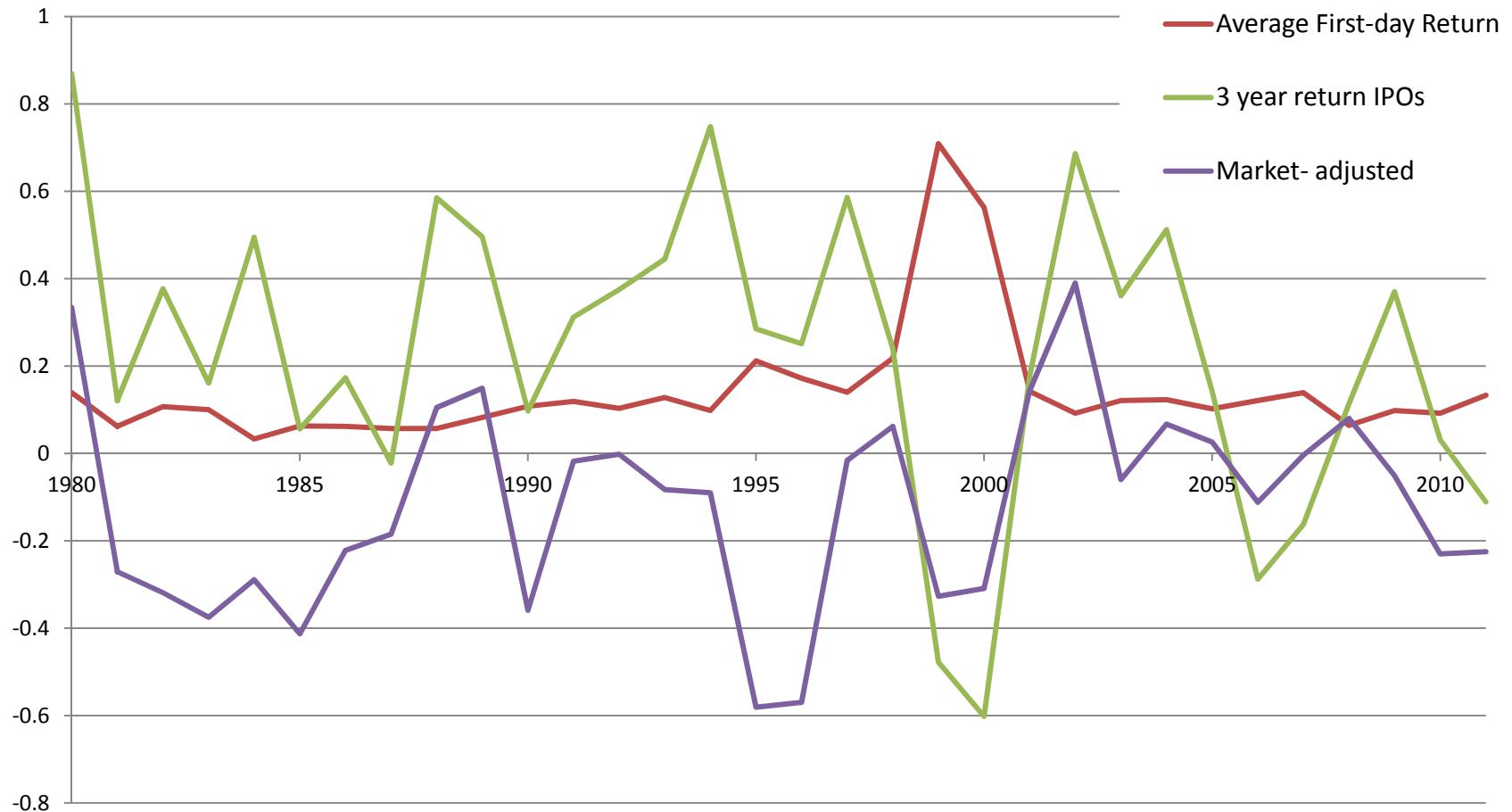


Figure 4



- <http://bear.warrington.ufl.edu/ritter/ipodata.htm>

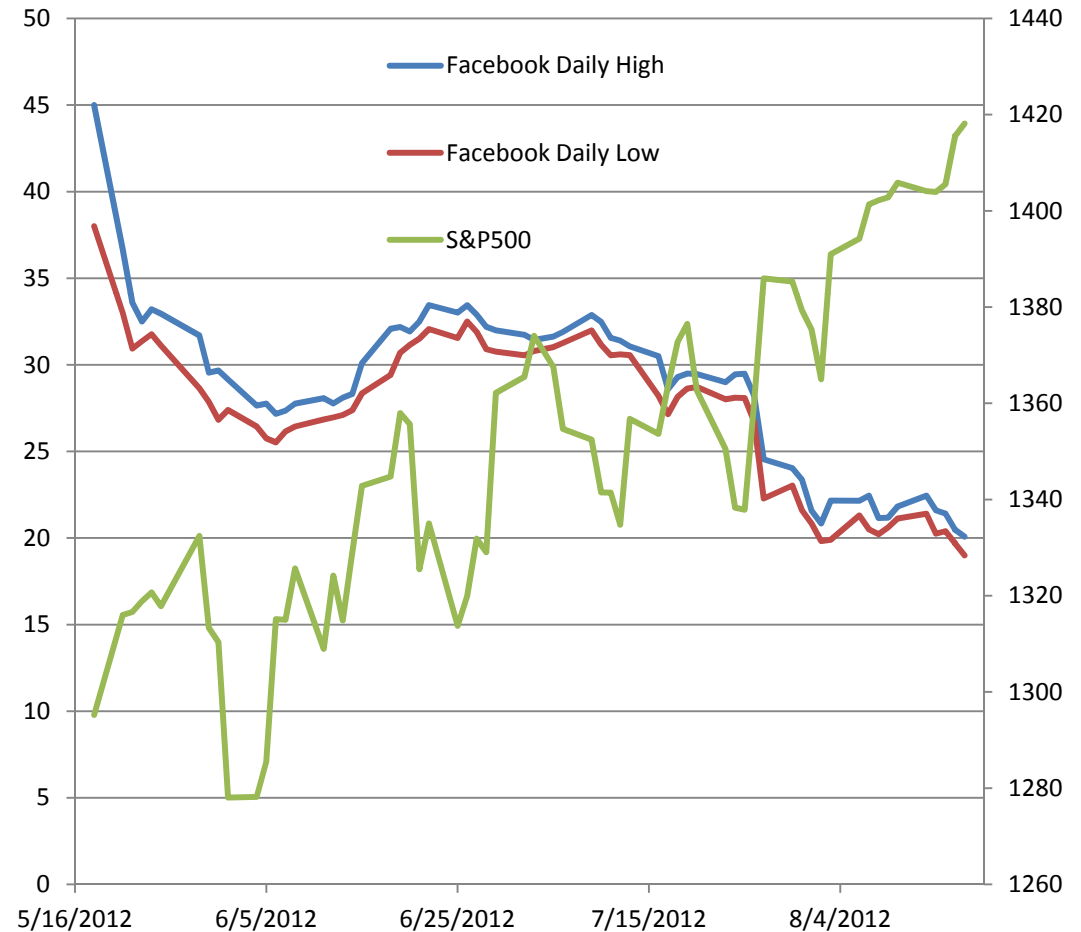
# Long Return are less Dramatic



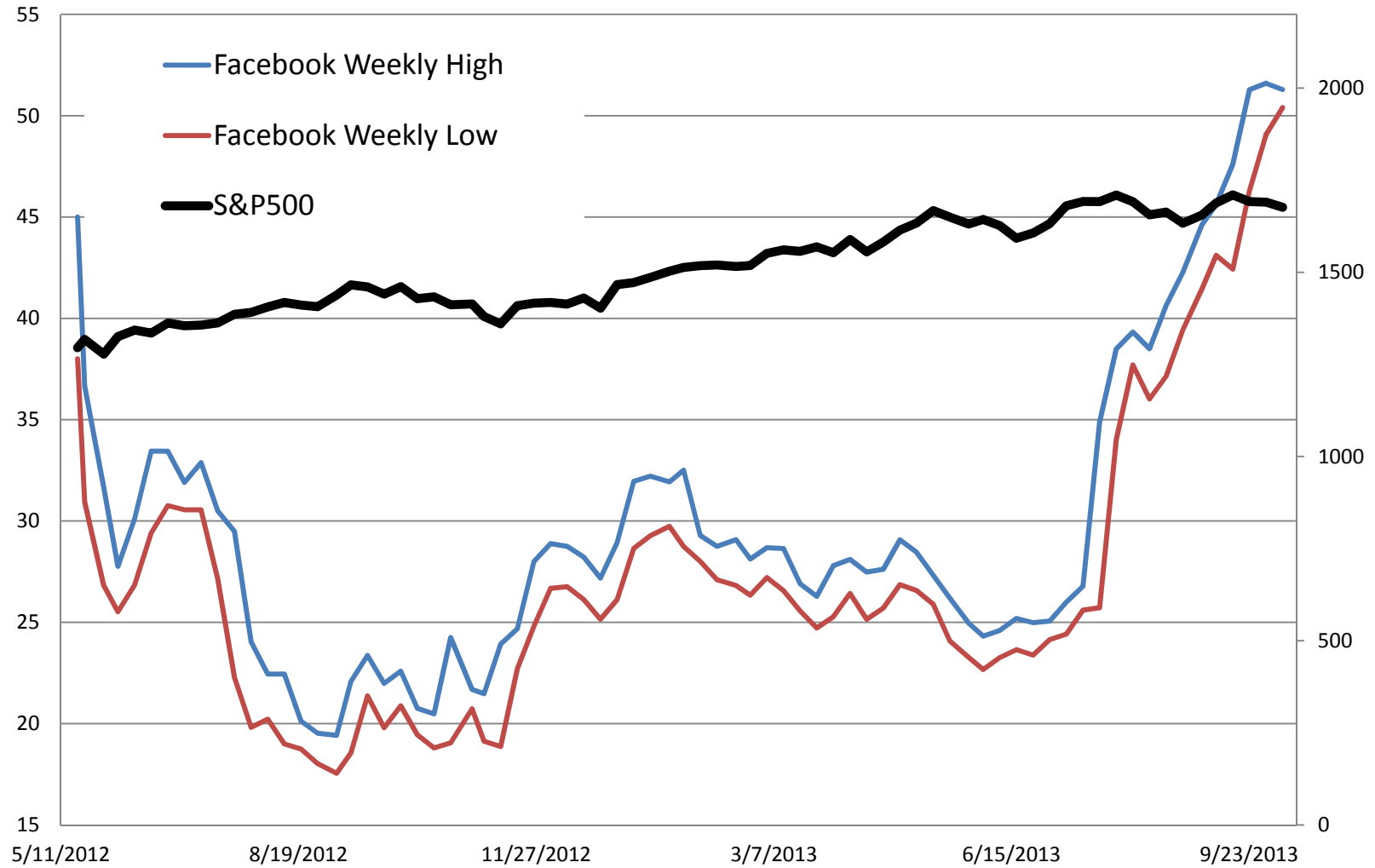
Market data does involve survivor bias

# Facebook

- Highly anticipated IPO
- Over subscribed
- So raise price and sell more shares
- 421 Million shares at \$38 for a total of 15 billion
- Yet problems arise immediately
- Revenues are falling...
- Returns in first two months are -52% when the SP500 returns 9.5%

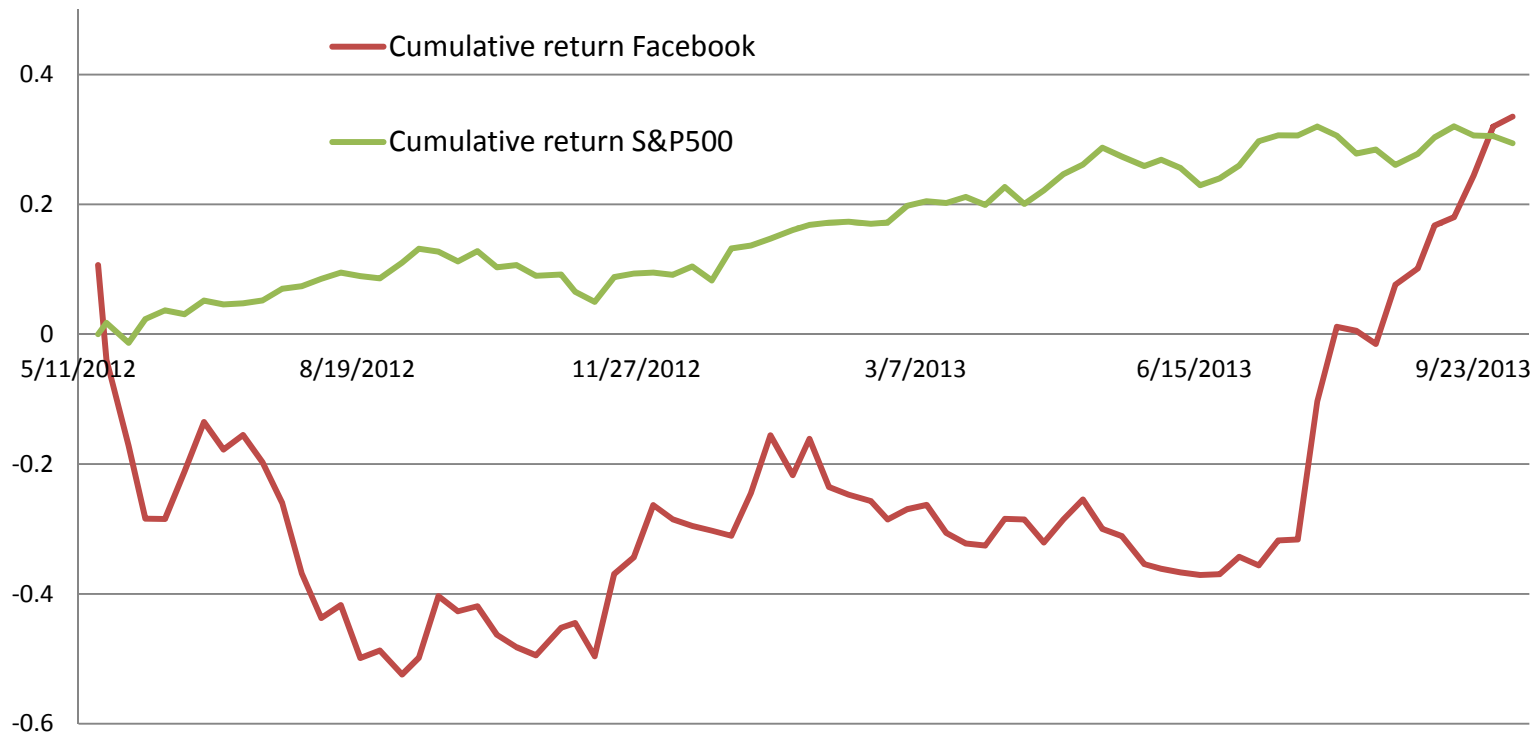


## Facebook Share price (weekly close) since IPO



# Cumulative returns

## Facebook Share price (weekly close) since IPO



Long term investor who bought at the IPO has just beat the S&P500 over the same period...

Does that mean the market was right?

# Investment stage

- There is a lot of risk (see week 4)
  - Many IPOs do poorly
  - Many do well
- There is a lot of asymmetric information
  - When things go ‘wrong’ people blame insiders
- But only about 10% of firms that receive venture capital go public
  - So this is not something that just about investors without experience.

# Next time

- 10-14 Class 5: Asymmetric Information
- **The market for lemons and the winner's curse.**
  - Individuals worry about winner's curse
- **Information cascades**
  - Individual take prices as information and neglect their own
- **Efficient market Information aggregation**
  - Prices reflect all the information in the market so transacting at the market price is fine