EFFICIENT MARKETS AND BEHAVIORAL FINANCE

Topics Covered

13-2

- We Always Come Back to NPV
- What is an Efficient Market?
  - Random Walk
  - Efficient Market Theory
- The Evidence Against Market Efficiency
- Behavioral Finance
- The Five Lessons of Market Efficiency

Return to NPV

13-3

- NPV employs discount rates
- These discount rates are risk adjusted
- The risk adjustment is a byproduct of market established prices
- Adjustable discount rates change asset values

Return to NPV

13-4

Example

The government is lending you $100,000 for 10 years at 3% and only requiring interest payments prior to maturity. Since 3% is obviously below market, what is the value of the below market rate loan?

$$\text{NPV} = \text{amount borrowed - PV of interest pmts}$$
$$\text{- PV of loan repayment}$$

Return to NPV

13-5

Example

The government is lending you $100,000 for 10 years at 3% and only requiring interest payments prior to maturity. Since 3% is obviously below market, what is the value of the below market rate loan?

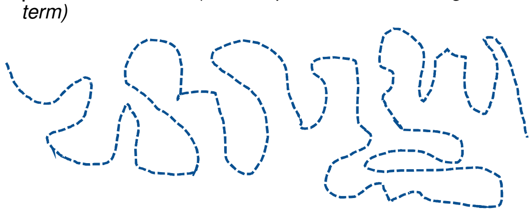
Assume the market return on equivalent risk projects is 10%.

$$\text{NPV} = 100{,}000 - \left[\sum_{t=1}^{10} \frac{3{,}000}{(1.10)^t}\right] - \frac{100{,}000}{(1.10)^{10}}$$
$$= 100{,}000 - 56{,}988$$
$$= \$43{,}012$$

Random Walk Theory

13-6

- The movement of stock prices from day to day DO NOT reflect any pattern
- Statistically speaking, the movement of stock prices is random *(skewed positive over the long term)*



Random Walk Theory

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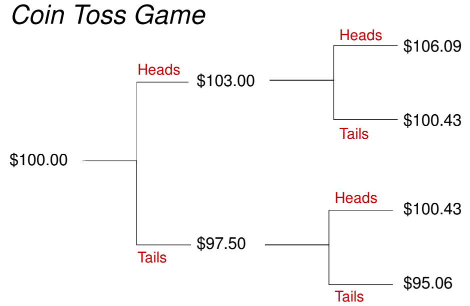
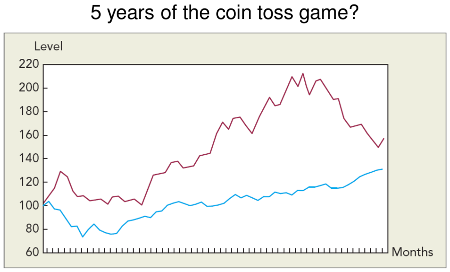
Coin Toss Game



Random Walk Theory

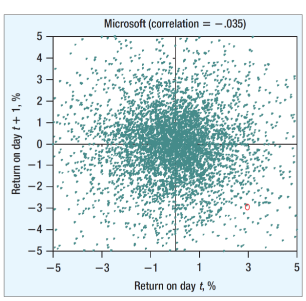
13-8

S&P 500 five year trend?
or
5 years of the coin toss game?



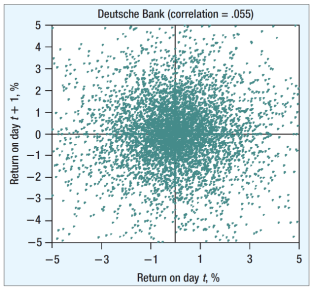
Random Walk Theory

13-9



Random Walk Theory

13-10



Random Walk Theory

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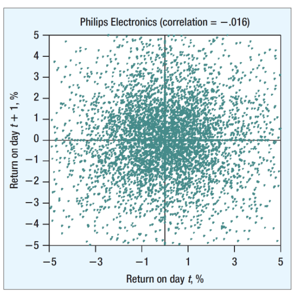

Random Walk Theory

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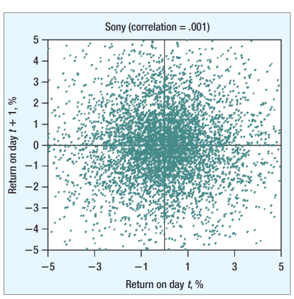
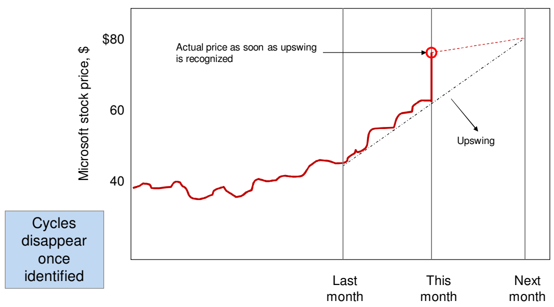


Efficient Market Theory

13-13



Efficient Market Theory

13-14

- Weak Form Efficiency
  - Market prices reflect all historical information
- Semi-Strong Form Efficiency
  - Market prices reflect all publicly available information
- Strong Form Efficiency
  - Market prices reflect all information, both public and private

Efficient Market Theory

13-15

Fundamental Analysts

- Research the value of stocks using NPV and other measurements of cash flow

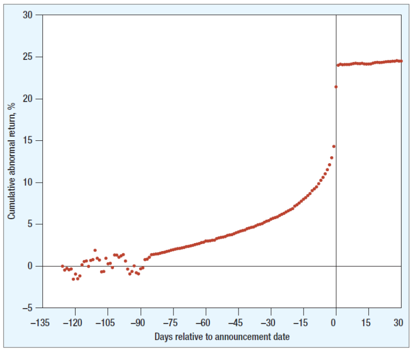
Adjusted stock return = return on stock – return on market index

$$\text{Expected return} = \alpha + \beta \times \text{return on market index}$$

$$\text{Expected return} = \text{actual stock return - expected stock return}$$
$$= \tilde{r} - (\alpha - \beta\,\tilde{r}_m)$$

Efficient Market Theory

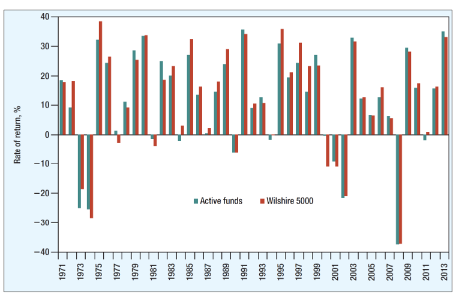
13-16



Efficient Market Theory

13-17

Average Annual Return on Mutual Funds and the Market Index



Price Anomalies

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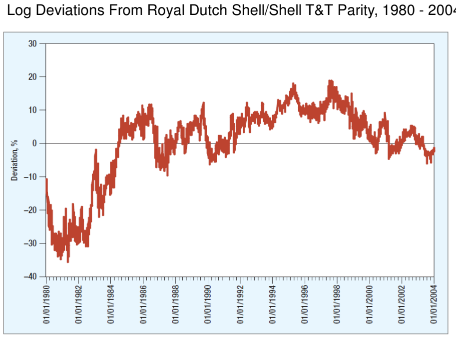
Log Deviations From Royal Dutch Shell/Shell T&T Parity, 1980 - 2004



Efficient Market Theory

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2014 Market Correction

$$\text{PV(stocks)}_{\text{Dec 2014}} = \frac{\text{Div}}{r-g} = \frac{350}{.060-.040} = \$17{,}500 \text{ bil}$$

$$\text{PV(stocks)}_{\text{growth drops}} = \frac{\text{Div}}{r-g} = \frac{350}{.060-.035} = \$14{,}000 \text{ bil}$$

Efficient Market Theory

13-20

2000 Dot.Com Boom

$$\text{PV(index)}_{\text{March 2000}} = \frac{\text{Div}}{r-g} = \frac{154.6}{.092-.08} = 12{,}883$$

$$\text{PV(index)}_{\text{October 2002}} = \frac{\text{Div}}{r-g} = \frac{154.6}{.092-.074} = 8{,}589$$

Efficient Market Theory

13-21

1987 Stock Market Crash

$$\text{PV(index)}_{\text{pre-crash}} = \frac{\text{Div}}{r-g} = \frac{16.7}{.114-.10} = 1193$$

$$\text{PV(index)}_{\text{post-crash}} = \frac{\text{Div}}{r-g} = \frac{16.7}{.114-.096} = 928$$

Behavioral Finance

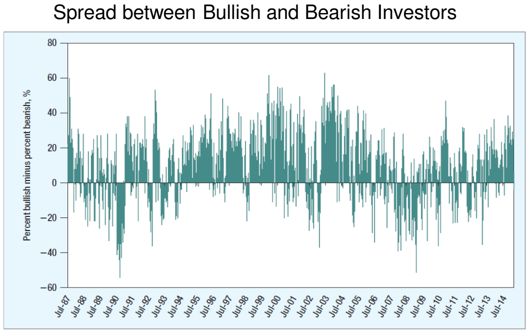
13-22

- Attitudes towards risk
- Beliefs about probabilities
- Sentiment
- Limits to arbitrage
- Incentive problems and the subprime crisis

Behavioral Finance

13-23

Spread between Bullish and Bearish Investors



Lessons of Market Efficiency

13-24

- Markets have no memory
- Trust market prices
- Read the entrails
- The *do it yourself* alternative
- Seen one stock, seen them all