

Monetary Economics

Efficient Markets and Alternatives

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Readings

- This lecture, Malkiel Part 3
- Next lecture, Cuthbertson, Chapter 6

Behavioral Finance

- “Behavioral finance is not a branch of standard finance: it is its replacement with a better model of humanity.” Meir Statman

Behavioral Finance

- “Behavioral finance is not a branch of standard finance: it is its replacement with a better model of humanity.” Meir Statman
- Replacing what?
 - Really economics and finance
 - Economic theory: Investors maximize their well being as they see it
 - Maximize expected utility
 - Foundation of efficient market hypothesis

Rational and Irrational

- Terms used a lot
 - Rational behavior
 - Rational markets
 - Irrational behavior
 - Irrational markets
- Also
 - Efficient market
 - Inefficient market

Rational and Irrational

- Terms used a lot
 - Rational behavior
 - Rational markets
 - Irrational behavior
 - Irrational markets
- Also
 - Efficient market
 - Inefficient market
- What do these terms mean?

Rational People

- Logical
 - Not what Economics means
- Procedural rationality
 - Whatever it is that people do, they are consistent in their choices
 - Observing people even ourselves (or at least me), not always even procedurally rational

What Really is Sufficient for Economics to Be Useful

- People do the best they can as they see it given what they know and their available resources
 - Not always what they would do afterwards
 - People make mistakes
- Do these mistakes matter for market prices?
 - In particular stock and bond markets

Rational Market

- I think people often mean that a rational market reflects the underlying factors suggested by economic theory

Rational Market

- I think people often mean that a rational market reflects the underlying factors suggested by economic theory
- Either the market is wrong or the theory is wrong

Efficient market

- Summarized as random-walk theory
- The price in an efficient market today reflects information available today
 - The price in an efficient market tomorrow reflects information available tomorrow
 - Prices change because of new information available
 - The new information is “news” and is not predictable
 - Therefore changes in the price are unpredictable

Versions of Efficient Market Hypothesis

- Weak form
 - The history of stock price movements contains no useful information that enables an investor consistently to outperform a buy-and-hold strategy in managing a portfolio
- Semi-strong form
 - Publicly available information contains no useful information that enables an investor consistently to outperform a buy-and-hold strategy in managing a portfolio
- Strong form
 - Nothing known by anyone enables an investor consistently to outperform a buy-and-hold strategy in managing a portfolio

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Alternative to Efficient Market

- There are predictable deviations of prices from those suggested by an efficient market
- Examples
 - Under-reaction to news
 - Over-reaction to news
 - Bubbles

Efficient-Market Reply

- Arbitrage by some people limits the deviations of prices from those suggested by available information
 - Arbitrage
 - Economics: Buy low and sell high
 - Finance: A riskfree trade that produces a positive return
 - Index arbitrage
 - Prices of S&P 500 futures and cash S&P 500
 - Prices of options and futures

Some Evaluations of Stock Prices

- Firm Foundations

$$p_t = \frac{d_{t+1}}{1+\delta} + \frac{d_{t+2}}{(1+\delta)^2} + \frac{d_{t+3}}{(1+\delta)^3} + \dots$$

- p_t is the price of a stock in period t
 - d_t is the dividend in period $t+1$
 - δ is the discount rate for future income
- Compare prices to what seems reasonable

Stock Price with Constant Dividends

- Firm Foundations

$$p_t = \frac{d_{t+1}}{1+\delta} + \frac{d_{t+2}}{(1+\delta)^2} + \frac{d_{t+3}}{(1+\delta)^3} + \dots$$

- Dividends constant

$$p_t = \frac{d}{\delta}$$

Stock Price with Dividends Growing at a Constant Rate

- Firm Foundations

$$p_t = \frac{d_{t+1}}{1+\delta} + \frac{d_{t+2}}{(1+\delta)^2} + \frac{d_{t+3}}{(1+\delta)^3} + \dots$$

- Dividends growing at a constant rate g

$$p_t = \frac{d}{\delta - g}$$

Stock Price and Earnings

- Firm Foundations

$$p_t = \frac{d_{t+1}}{1+\delta} + \frac{d_{t+2}}{(1+\delta)^2} + \frac{d_{t+3}}{(1+\delta)^3} + \dots$$

- Dividends a constant fraction (f) of earnings (e)

$$p_t = \frac{fe_{t+1}}{1+\delta} + \frac{fe_{t+2}}{(1+\delta)^2} + \frac{fe_{t+3}}{(1+\delta)^3} + \dots$$

Stock Price and Earnings

- Firm Foundations

$$p_t = \frac{d_{t+1}}{1+\delta} + \frac{d_{t+2}}{(1+\delta)^2} + \frac{d_{t+3}}{(1+\delta)^3} + \dots$$

- Dividends a constant fraction of earnings

$$p_t = \frac{fe_{t+1}}{1+\delta} + \frac{fe_{t+2}}{(1+\delta)^2} + \frac{fe_{t+3}}{(1+\delta)^3} + \dots$$

- And growing at a constant rate g

$$p_t = \frac{fe_{t+1}}{\delta - g}$$

- *P/E ratio*

$$\frac{p_t}{e_{t+1}} = \frac{f}{\delta - g}$$

Market Behavior Not Consistent with Economic Theory

- Experiments can produce bubbles
 - Fundamentals are known to experimenter
 - Price higher than suggested by fundamentals
 - Price falls toward the end of the experiment

Market Behavior Not Consistent with Economic Theory

- Experiments with human participants can produce bubbles
 - Fundamentals are known to experimenter
 - Price higher than suggested by fundamentals
 - Price falls toward the end of the experiment
- Issue is whether the experiment is set up in such a way that people almost inevitably will do strange things (framing)

Behavior Not Consistent with Economic Theory

- In experiments which solicit opinions
 - Most students think they are above-average drivers
 - Most students think they will have rosier futures than average student
- People are overconfident
 - In the stock market, this can translate into many people believing they can “beat the market” (do better than average)
 - Evidence indicates
 - People who trade more have lower returns
 - Individual investors in futures markets lose on average

Representativeness Heuristic

- People assume that a sequence should look like the process that generated it
 - An unbiased die thrown six times – There is a nonzero probability of getting six threes
- So years of no hurricane lead people to think one is “due” even though whether there is one has no effect on the probability of one this year
 - Sample should represent population

Herding

- Herding: Following other peoples' views even when it is inconsistent with one's own information
 - Netflix as an example: Very high P/E ratio
 - Version of “greater fool theory”

Loss Aversion

- People are averse to realizing losses
- They tend to sell winners and hold onto losers
 - Waiting for loser to turn into a winner
- Houses: After 2007, it took a long time for prices to fall as people kept asking prices too high to sell them

Framing

- People respond differently depending on how a question is posed

Frame 1

- The United States is preparing for the outbreak of an unusual Asian disease which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:
 - If program A is adopted, 200 people will be saved.
 - If program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no one will be saved.

Frame 2

- The United States is preparing for the outbreak of an unusual Asian disease which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:
 - If program A* is adopted, 400 people will die.
 - If program B* is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die.

Disposition Effect

- People tend to stay in whatever position they are in.
- 401(K) savings plans
 - If have to sign up when employed, many do not participate
 - If have to opt out, fewer do not participate

Market Prices

- Even if some or even quite a few people are “irrational”, market prices still can be as informative as if everyone were “rational”
 - How many or how large a proportion of funds invested? No one knows
- Limits to arbitrage
 - Arbitrage in terms of selling a security short is very risky
 - Sell Amazon and buy Wal-Mart
 - If selling short is risky or expensive or not possible, only the votes of the optimists are counted

Implications for Individual Investors

- Avoid herding

Implications for Individual Investors

EXHIBIT ONE
THE TIMING PENALTY: EQUITY FUND CASH FLOW
FOLLOWS THE STOCK MARKET

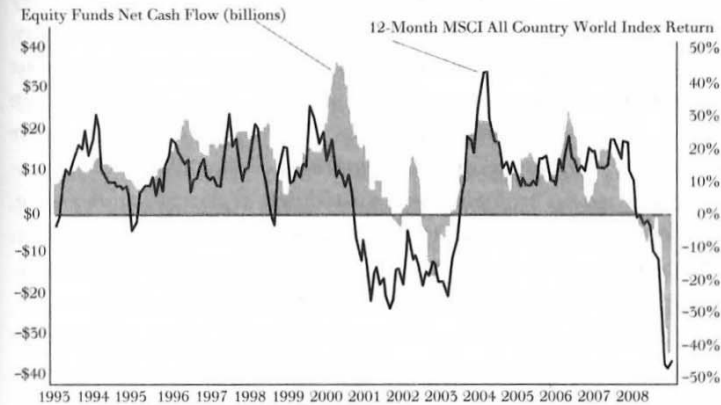
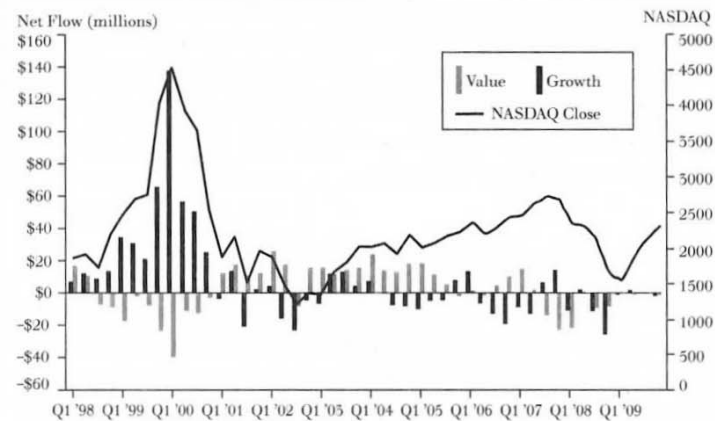


EXHIBIT TWO
THE SELECTION PENALTY: QUARTERLY FLOW INTO GROWTH
AND VALUE FUNDS, AND THE NASDAQ'S CLOSE



Source: Strategic Insight.

Implications for Individual Investors

Disadvantage to be doing what everyone else is doing

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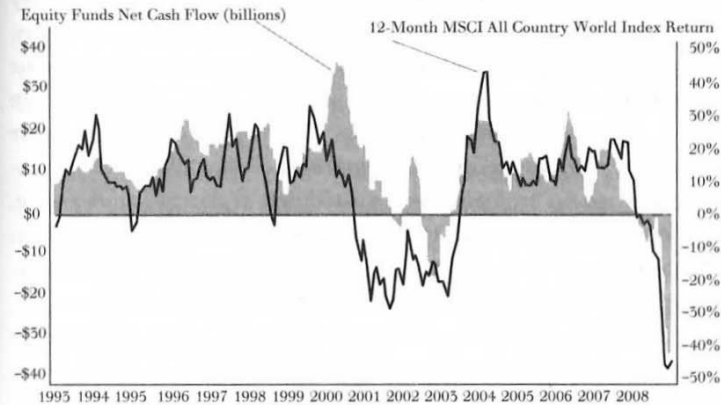
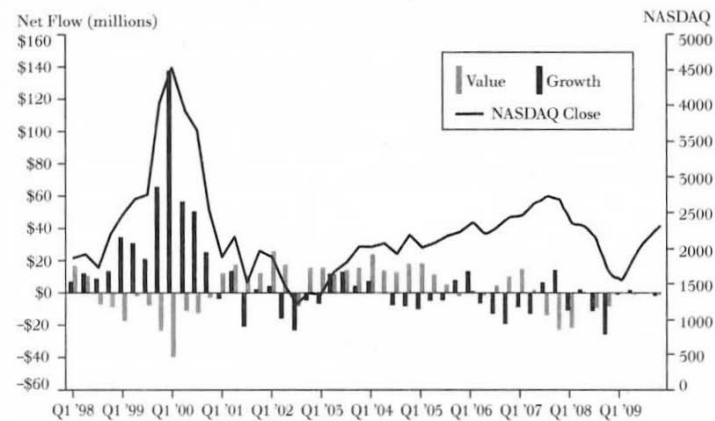


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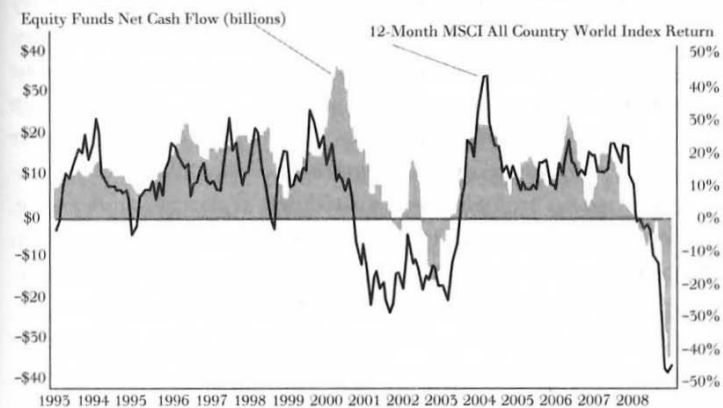
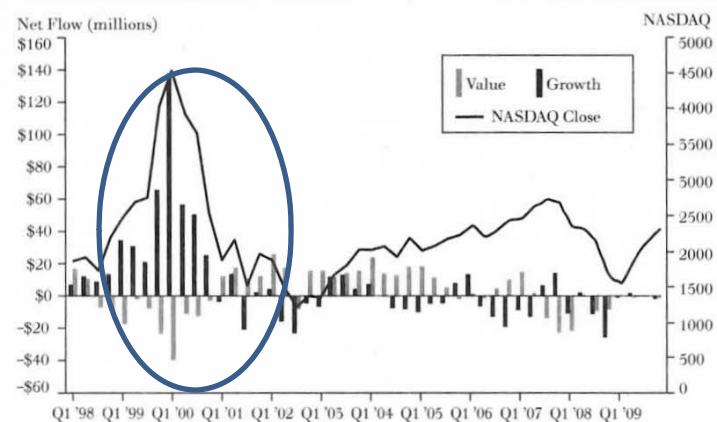


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Chasing returns

Implications for Individual Investors

- Avoid herding
- Avoid overtrading
 - A truism
 - What is “overtrading”? Trading too much

Implications for Individual Investors

- Avoid herding
- Avoid overtrading
 - A truism
 - What is “overtrading”? Trading too much
 - More seriously, buy and hold is hard to beat

Implications for Individual Investors

- Avoid herding
- Avoid overtrading
- If you do trade: Sell losers, not winners
 - Be aware that it is hard to “realize” losses
 - Tax effects suggest selling losers

Implications for Individual Investors

- Avoid herding
- Avoid overtrading
- If you do trade: Sell losers, not winners
- Other stupid investor tricks
 - Be wary of new issues (IPOs)
 - Stay cool to hot tips
 - Distrust foolproof schemes

Efficient Market Theory

- Efficient Market Hypothesis
 - Financial markets are very successful at reflecting news rapidly and accurately
 - Financial markets do not allow investors to earn above-average returns without accepting above-average risk.
- Story about a \$100 bill and professor who believes in efficient markets

Efficient Market Theory

- Story about a \$100 bill and professor who believes in efficient markets
 - Moral: Sometimes there are \$100 bills lying around. Pick them up.

Efficient Market Theory

- Story about a \$100 bill and professor who believes in efficient markets
 - Moral: Sometimes there are \$100 bills lying around. Pick them up.
 - Second moral: Don't expect to earn your living by picking up \$100 bills on the sidewalk.

Potshots at Efficient Market Theory

- Dogs of the Dow
 - Each year buy ten stocks in Dow with highest dividend yield and presumably out of favor
- January effect
 - Higher return in first two weeks of each year
 - Only on average and not big enough to cover transactions costs
- Negative return from Friday close to Monday close
 - Transactions costs make it not profitable to exploit directly
- Under-reaction to news
 - Controversial

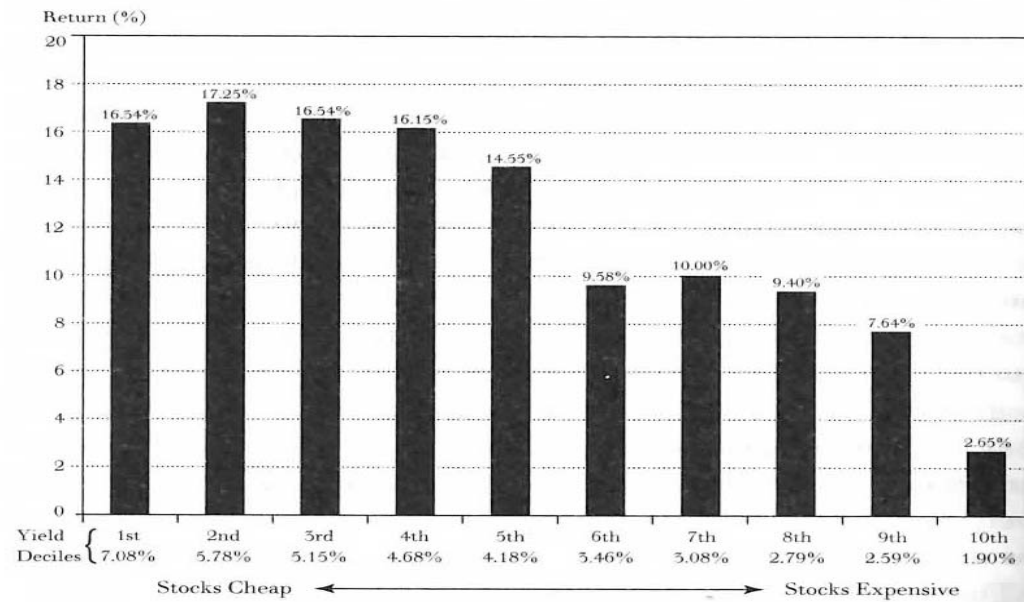
Potshots Which Get Closer

- Trend is your friend
 - Version of chartism
 - Consistency not clear

Potshots Which Get Closer

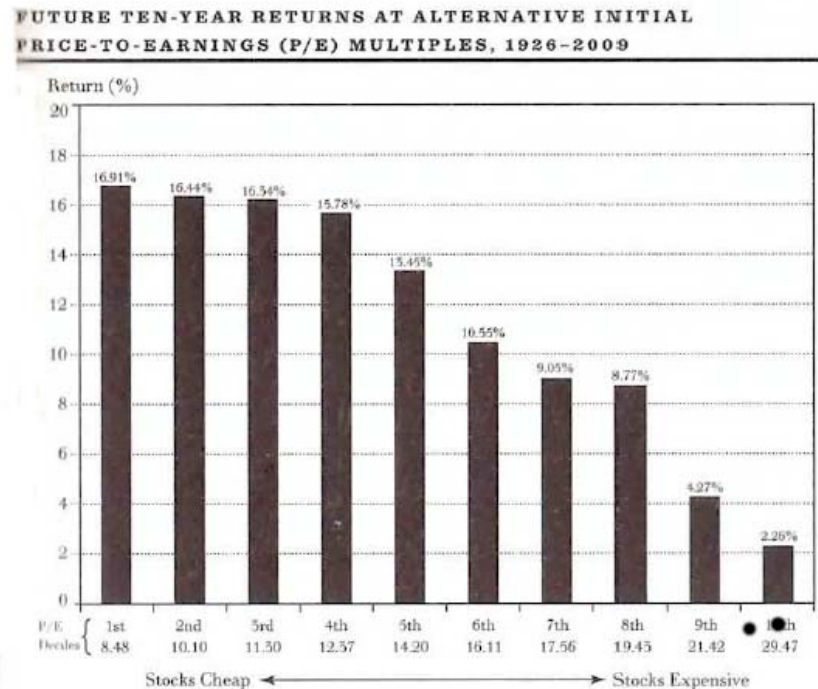
- Dividend yields help to predict returns
 - Returns tend to be higher in the future when stocks in general have higher dividend yields

FUTURE TEN-YEAR RETURNS AT ALTERNATIVE INITIAL DIVIDEND YIELDS (D/P), 1926-2009



Potshots Which Get Closer

- Initial P/E ratios help to predict returns
 - Returns tend to be higher in the future when stocks in general have lower P/E ratios

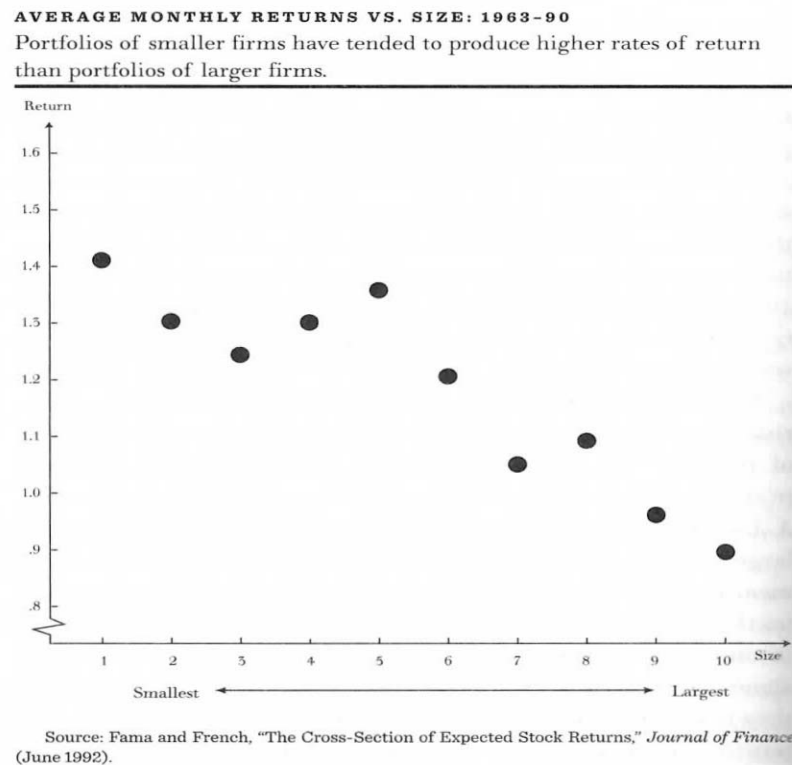


Potshots Which Get Closer

- Long-run return reversals
- Stocks are likely to have above-average returns over the next couple of years if they have had below-average returns over the last couple of years
 - Regression to average
 - If above average recently, likely to be below average in near future
- Explanations
 - Castles in the air
 - Fundamentals
 - Interest rates
 - Risk

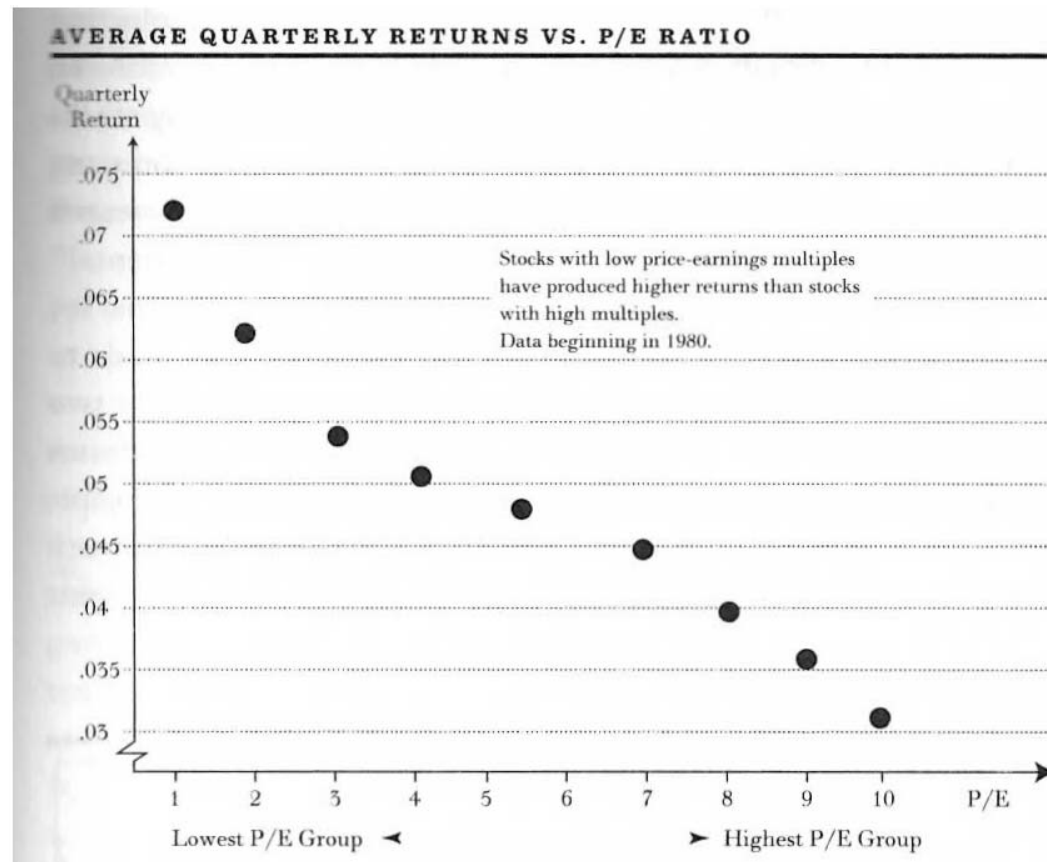
Potshots Which Get Closer

- Small firm effect
- Returns tend to be higher for smaller firms



Potshots Which Get Closer

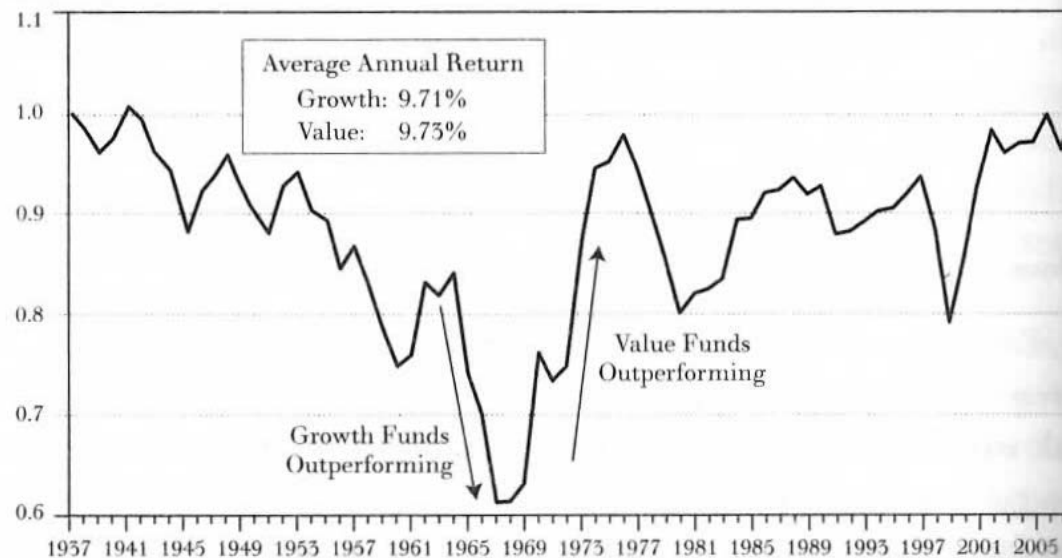
- Stocks are likely to have higher returns if they have low P/E ratios



Potshots Which Get Closer

- Value versus Growth mutual funds

**REVERSION TO THE MEAN:
"GROWTH" FUNDS VS. "VALUE" FUNDS, 1937-2008**



Growth — Lipper Growth
Value — Lipper Growth & Income

This graph shows the market value of an investment in all "value" funds divided by the same investment in all "growth" funds.

Source: Lipper Analytic Services and Bogle Research Institute.

Potshots at Efficient Market Theory

- Performance of Professional Investors consistent with theory

PERCENTAGE OF U.S. EQUITY FUNDS OUTPERFORMED BY BENCHMARKS: FIVE YEARS TO JANUARY 2010 Percent outperformed by index

<i>Fund Category</i>	<i>Benchmark Index</i>	<i>Percent Outperformed</i>
All Domestic Equity	S&P 1500	60.6%
All Large-Cap Funds	S&P 500	60.8
All Mid-Cap Funds	S&P Mid-Cap 400	77.2
All Small-Cap Funds	S&P Small-Cap 600	66.6
All Multi-Cap Funds	S&P Small-Cap 1500	61.9
Global Funds	S&P Global 1200	60.0
International Funds	S&P 700	88.6
Emerging Markets Funds	S&P/IFCI Composite	90.0

Source: Standard & Poor's and CRSP Survivor Bias-Free U.S. Mutual Fund Data Base.

Market Inefficiency

- “A true market inefficiency ought to be an exploitable opportunity.” Richard Roll
- A true market inefficiency is not just a higher return for taking on more risk.

Summary

- Efficient markets theory is a good standard for starting to evaluate stock returns
- Market does reflect information quickly
 - Some finance professors have shown second by second how prices react to news in a matter of minutes

Summary

- People tend to make same mistakes
 - Herding
 - Overtrading
 - People tend to sell winners, hold losers and lose more
 - People are “over-confident”
 - New issues (IPOs) have low returns
 - Watch for framing effects

Summary

- Markets
- Small firms seem to have higher return for same risk
- Firms with low P/E ratios tend to have higher future returns
- When dividend yields are high and/or P/E ratios are low, stocks tend to have higher returns
- When returns have been high for the last few years, they tend to be low for the next few years
- Most professional investors do worse than a mindless portfolio of stocks based on current market capitalization