# Investment Redux

## Behavioral Finance

April 3, 2014

# Behavioral Finance, Introduction

- Sooner or later, you are going to make an investment decision that winds up costing you a lot of money.

- Why is this going to happen?
  - You made a sound decision, but you are “unlucky.”
  - You made a bad decision—one that could have been avoided.

- The beginning of investment wisdom:
  - Learn to recognize circumstances leading to poor decisions.
  - Then, you will reduce the damage from investment blunders.

# Behavioral Finance, Definition

- **Behavioral Finance** The area of research that attempts to understand and explain how reasoning errors influence investor decisions and market prices.

- Much of behavioral finance research stems from the research in the area of cognitive psychology.
  - **Cognitive psychology**: the study of how people (including investors) think, reason, and make decisions.
  - Reasoning errors are often called cognitive errors.

- Some people believe that cognitive (reasoning) errors made by investors will cause market inefficiencies.

# Three Economic Conditions that Lead to Market Efficiency

1) Investor rationality
2) Independent deviations from rationality
3) Arbitrage

- For a market to be **inefficient**, all three conditions must be absent. That is,
  - it must be that many, many investors make irrational investment decisions, **and**
  - the collective irrationality of these investors leads to an overly optimistic or pessimistic market situation, **and**
  - this situation cannot be corrected via arbitrage by rational, well-capitalized investors.

- Whether these conditions can all be absent is the subject of a raging debate among financial market researchers.

# Prospect Theory

- Prospect theory provides an alternative to classical, rational economic decision-making.
- The foundation of prospect theory: investors are much more distressed by prospective losses than they are happy about prospective gains.
  - Researchers have found that a typical investor considers the pain of a $1 loss to be about **twice** as great as the pleasure received from the gain of $1.
  - Also, researchers have found that investors respond in different ways to **identical** situations.
  - The difference depends on whether the situation is presented in terms of losses or in terms of gains.

# Investor Behavior Consistent with Prospect Theory Predictions

- There are three major judgment errors consistent with the predictions of prospect theory.
  - **Frame Dependence**
  - **Mental Accounting**
  - **The House Money Effect**

- There are other judgment errors that are also consistent with the predictions of prospect theory.

# Frame Dependence, I.

- If an investment problem is presented in two different (but really equivalent) ways, investors often make inconsistent choices.
- That is, how a problem is described, or framed, seems to matter to people.
- Some people believe that frames are transparent.
- Consider  the following two scenarios.

# Frame Dependence, II.

- **Scenario One.** Suppose we give you $1,000.

  Then, you have the following choice to make:

  A. You can receive another $500 for sure.

  B. You can flip a fair coin. If the coin-flip comes up “heads,” you get another $1,000, but if it comes up “tails,” you get nothing.

- **Scenario Two.** Suppose we give you $2,000.

  Then, you have the following choice to make:

  A. You can lose $500 for sure.

  B. You can flip a fair coin. If the coin-flip comes up “heads,” you lose another $1,000, but if it comes up “tails,” you lose nothing.

# Frame Dependence, III.

- What were your answers?
- Did you: choose option A in the first scenario
  **and** choose option B in the second scenario?
  - If you did, you are guilty of focusing on gains and losses, and not paying attention to what is important—the impact on your wealth.
  - However, you are not alone.
    - About 85 percent of the people who are presented with the first scenario choose option A.
    - About 70 percent of the people who are presented with the second scenario choose option B.

# Frame Dependence, IV.

- But, the two scenarios are actually identical.
- In each scenario:
  - You end up with $1,500 for sure if you pick option A.
  - You end up with a 50-50 chance of either $1,000 or $2,000 if you pick option B.
  - So, you should pick the same option in both scenarios.
- Which option you prefer is up to you.
- But, if you are focusing on wealth, you should never pick option A in one scenario and option B in the other.
- The reason people do is that the phrasing, or framing, of the question causes people to answer the questions differently.

# Mental Accounting and Loss Aversion

- **Mental Accounting**: Associating a stock with its purchase price.

- If you are engaging in mental accounting:
  - You find it is difficult to sell a stock at a price lower than your purchase price.
  - If you sell a stock at a loss:
    - It may be hard for you to think that purchasing the stock in the first place was correct.
    - You may feel this way even if the decision to buy was actually a very good decision.
  - A further complication of mental accounting is **loss aversion.**

- **Loss Aversion**: A reluctance to sell investments after they have fallen in value. Also known as the "breakeven" effect or "disposition" effect.

- If you suffer from Loss Aversion, you will think that if you can just somehow "get even," you will be able to sell the stock.

- If you suffer from Loss Aversion, it is sometimes said that you have "get-evenitis."

# Do You Suffer from “Get-Evenitis?” Part I.

- Consider the following two investments:

  **Investment One.** A year ago, you bought shares in Fama Enterprises for $40 per share. Today, these shares are worth $20 each.

  **Investment Two.** A year ago, you bought shares in French Company for $5 per share. Today, these shares are worth $20 each.

- What will you do? Will you: (1) sell one of these stocks; (2) sell both of these stocks; (3) hold one of these stocks; or, (4) hold both of these stocks?

# Do You Suffer from “Get-Evenitis?” Part II.

- Suppose you are considering a new investment in Fama Enterprises.
- Does your rational analysis say that it is reasonable to purchase shares at $20?
  - **If the rational answer is no, then you should sell.**
  - **If the rational answer is yes, then you do not suffer from loss aversion.**
- However, if you argued to yourself that if shares in Fama Enterprises were a good buy at $40, then they must be a **steal** at $20, you probably have a raging case of loss aversion.

# Do You Suffer from "Get-Evenitis?" Part III.

- There are Two Important Lessons from this Example.
  - **Lesson One**: The **market** says that shares in Fama Enterprises are worth $20. The **market** does not care that you paid $40 a year ago.
  - **Lesson Two**: **You** should not care about your purchase price of Fama Enterprises. **You** must evaluate your shares at their current price.
- How about the shares in French Company?
  - Once again, the lessons are the same.
  - The market says that French Company shares are worth $20 today.
  - The fact that you paid $5 a year ago is not relevant.
- Get-Evenitis can be destructive. Famous example: Nicholas Leeson causing the collapse of the 233-year-old Barings Bank.

# The House Money Effect, I.

- Las Vegas casinos have found that gamblers are far more likely to take big risks with money that they have won from the casino (i.e., “house money”).
- Also, casinos have found that gamblers are not as upset about losing house money as they are about losing their own gambling money.
- It may seem natural for you to separate your money into two buckets:
  - Your very precious money earned through hard work, sweat, and sacrifice.
  - Your less precious windfall money (i.e., house money).
- But, this separation is plainly irrational.
  - Any dollar you have buys the same amount of goods and services.
  - The buying power is the same for “your money” and for your “house money.”

# The House Money Effect, II.

- Let us return to the shares of Fama Enterprises and French Company.
- Suppose shares in both were to decline to $15.
- You might feel very differently about the decline depending on which stock you looked at.
  - With Fama Enterprises, the decline makes a bad situation even worse. Now you are down $25 per share on your investment.
  - On the other hand, with French Company, you only “give back” some of your “paper profit.” You are still way ahead.

# The House Money Effect, III.

- Thinking this way means that you are guilty of playing with house money.
- Whether you lose money from your original investment or lose money from your investment gains is **irrelevant**.
- There are two important investment lessons here:
  - **Lesson One.** There are no “paper profits.” Your profits are yours.
  - **Lesson Two.** All your money is your money. You should not separate your money into bundles labeled “my money” and “house money.”

# Overconfidence: A Significant Error in Investor Judgment

- A serious error in judgment you can make as an investor is to be overconfident.
- We are all overconfident about our abilities in many areas.
- Be honest: Do you think of yourself as a better than average driver?
  - **If you do, you are not alone.**
  - **About 80 percent of the people who are asked this question will say "yes."**
- How does overconfidence affect investment decisions?

# Overconfidence and Portfolio Diversification

- Investors tend to invest too heavily in shares of the company for which they work.
- This loyalty can be very bad financially.
  - Your earning power (income) depends on this company.
  - Your retirement nest-egg also depends on this company.
- Another examples of the lack of diversification is investing too heavily in the stocks of local companies.
  - Perhaps you know someone personally who works there.
  - Perhaps you read about them in your local paper.
  - Basically, you are unduly confident that you have a high degree of knowledge about local companies.

# Overconfidence and Trading Frequency, I.

- If you are overconfident about your investment skill, it is likely that you will trade too much.
- Researchers have found that investors who make relatively more trades have lower returns than investors who trade less frequently.
- Researchers have found that the average household earned an annual return of 16.4 percent.
- Researchers have found that households that traded the most earned an annual return of only 11.4 percent.
- The moral is clear: Excessive trading is hazardous to your wealth.

# Overconfidence and Trading Frequency, II. Is Overtrading "a Guy Thing?"

- Psychologists have found that men are more overconfident than women in the area of finance. So,
  - Do men trade more than women?
  - Do portfolios of men under-perform the portfolios of women?
- Researchers show that the answer to both questions is yes.
- Men trade about 50 percent more than women.
- Researchers show that both men and women reduce their portfolio returns when they trade excessively.
  - The portfolio return for men is 94 basis points lower than portfolio returns for women.
  - The portfolio return for **single** men is 144 basis points lower than the portfolio return for **single** women.
- Accounting for the effects of marital status, age, and income, researchers also show that men invest in riskier positions.

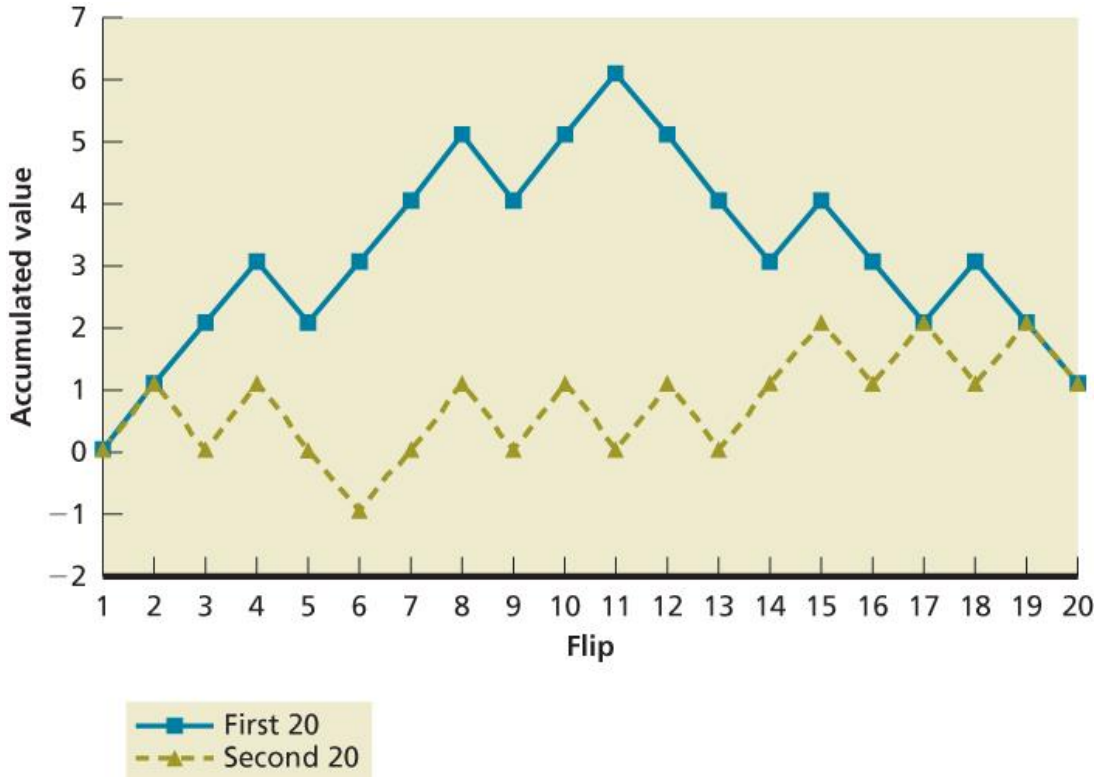
# Misperceiving Randomness and Overreacting to Chance Events

- Cognitive psychologists have discovered that the human mind is a pattern-seeking device.
- Humans conclude that there are causal factors or patterns at work behind sequences of events even when the events are truly random.
- The **representativeness heuristic**: Concluding that there are causal factors at work behind random sequences. Or, if something is random, it should look random.
- But, what does random look like?

# A Coin Flipping Experiment

- Suppose we flip a coin twenty times and write down whether we get a “head” or a “tail.”
- Then, we do it all over again. The results of our two sets of twenty flips are:
  - 1st Twenty: **T T T H T T T H T T H H H T H H T H H H**
  - 2nd Twenty: **T H T H H T T H T H T H T T H T H T H H**
- Do these sequences of heads and tails both look random to you?
- Most people would say that the 1st Twenty and the 2nd Twenty somehow look “different.”
  - Both are random sequences.
  - Both have ten heads and ten tails.

# A Coin Flipping Experiment, Graphed




- Do you think the line labeled “1st Twenty” has a pattern to it, but the line labeled “2nd Twenty” appears to be random?

- If so, your mind saw a pattern in a random sequence of coin flips.

# The Hot-Hand Fallacy, I.

- Suppose we look at the recent shooting by two basketball players named LeBron and Shaquille.
- Assume both of these players make half of their shots.
  - LeBron: **has just made** two shots in a row.
  - Shaquille: **has just missed** two shots in a row.
- Researchers have found that if they ask **basketball fans** which player has the better chance of making their next shot:
  - 91 out of 100 will say LeBron.
  - They say this because they think LeBron has a “hot-hand.”
- But, researchers have found that the “hot hand” is an illusion.
  - Players do not deviate much from their long-run shooting averages.
  - However, fans, players, announcers, and coaches think that they do.

# The Hot-Hand Fallacy, II.

- Cognitive psychologists have studied the shooting percentage of one NBA team for a season and found:

**TABLE 8.2** Shooting Percentages and the History of Previous Attempts

| Shooting Percentage on Next Shot | History of Previous Attempts |
|---|---|
| 46% | Made 3 in a row |
| 50 | Made 2 in a row |
| 51 | Made 1 |
| 52 | First shot of the game |
| 54 | Missed 1 |
| 53 | Missed 2 in a row |
| 56 | Missed 3 in a row |

- A detailed analysis of the shooting data reveals that, statistically speaking, all shooting percentages in this table are the “same.”
- It is true that basketball players shoot in streaks. But, these steaks are within bounds for long-run shooting percentages.

# The Hot-Hand Fallacy, III.

- It is an illusion that basketball players are either “hot” or “cold.”
  - If you believe in the “hot hand,” you will likely reject this fact because you “know better” from watching shooters.
  - You are being fooled by randomness—randomness often appears in clusters.
- **Clustering Illusion**: Our human belief that random events that occur in clusters are not really random.
  - Example: If a fair coin is flipped 20 times, there is about a 50 percent chance of flipping four heads in a row.
  - If you flip four heads in a row, do you have a “hot hand” at coin flipping?
- Mutual fund investing and the clustering illusion.
  - Every year, funds that have had exceptionally good performance receive large inflows of money.
  - There is a universal disclaimer: “Past performance is no guarantee of future results.” Nonetheless, investors chase past returns.

# The Gambler's Fallacy

- **Gambler's Fallacy**: Assuming that a departure for what occurs on average will be corrected in the short run.

- Another way to think about the gambler's fallacy: because an event has not happened recently, it has become "overdue" and is more likely to occur.

- Example: The odds on a US Roulette table never change.
  - For each spin:
    - There is an 18 in 38 chance for a red number to "hit"
    - There is an 18 in 38 chance for a black number to "hit"
    - There is a 2 in 38 chance for a green number to "hit"
  - You suffer from the Gambler's Fallacy if you think that it is more likely for a black number to "hit" after a series of red numbers have hit.

# Sentiment-Based Risk and Limits to Arbitrage, I.

- The efficient markets hypothesis (EMH) does not require every investor to be rational.
- All that EMH requires is that there are at least some smart and well-financed investors.
  - These investors are prepared to buy and sell to take advantage of any mispricing in the marketplace.
  - This activity is what keeps markets efficient.
- Sometimes, however, a problem arises in this context.
- **Limits to Arbitrage**: The notion that, under certain circumstances, it may not possible for rational, well-capitalized traders to correct a mispricing, at least not quickly.

# Sentiment-Based Risk and Limits to Arbitrage, II.

- Strategies designed to eliminate mispricings are often risky, costly, or restricted. Three important problems are:

- *Firm-Specific Risk (the most obvious risk).*
  - Suppose you believe that GM's stock price is too low, so you buy.
  - Then, some unanticipated bad news drives GM's stock price lower.

- *Noise Trader Risk (also known as sentiment-based risk)*
  - **Noise Trader**: Someone whose trades are not based on information or financially meaningful analysis.
  - Noise traders could act "together" to worsen a mis-pricing.
  - Noise trader risk is important because the worsening of a mis-pricing could force the arbitrageur to liquidate early (and sustain steep losses).
  - If noise trader risk exists, then this risk is another source of risk beyond systematic risk and unsystematic risk.

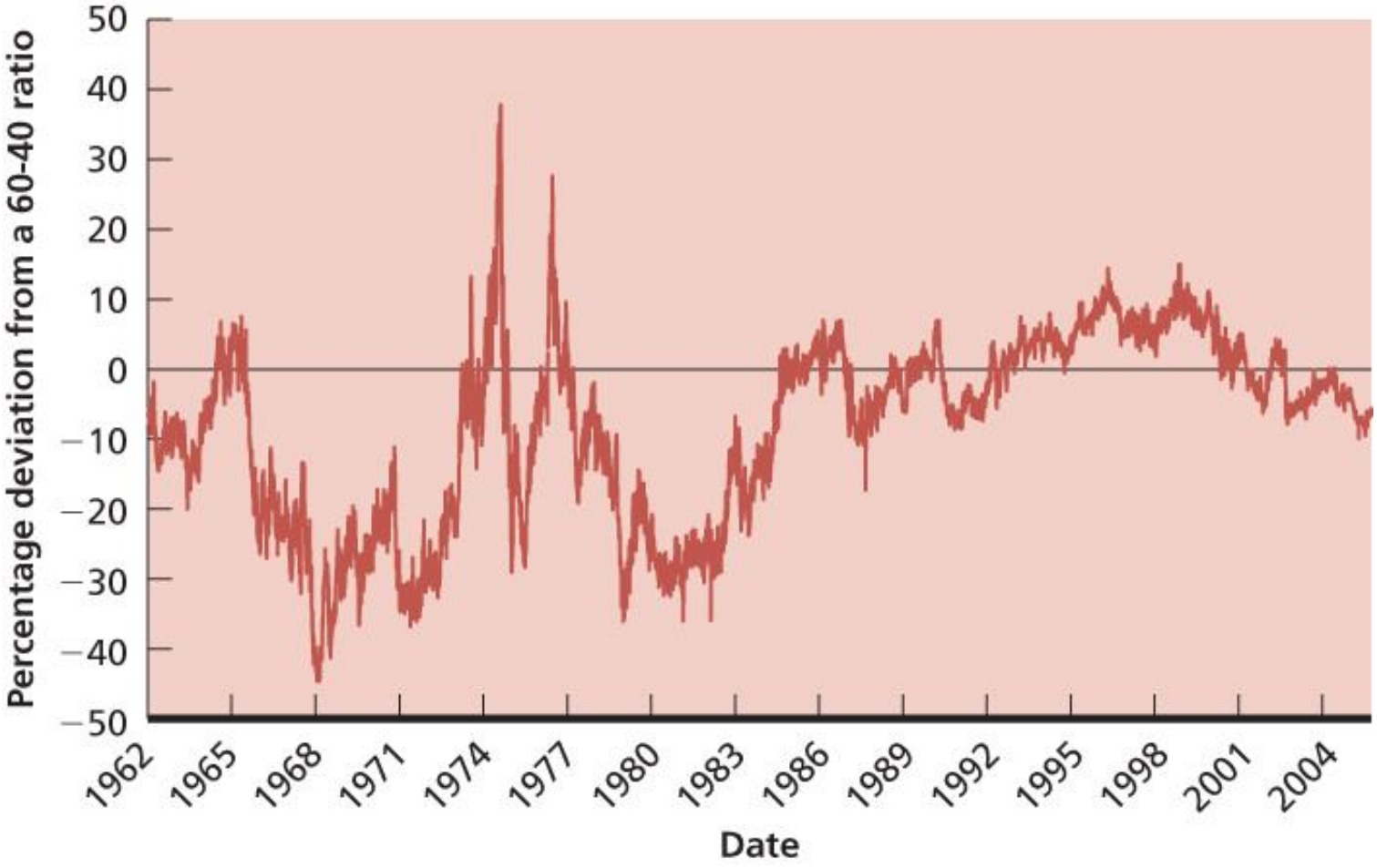
# Sentiment-Based Risk and Limits to Arbitrage, III.

- **Implementation Costs**: These costs include transaction costs such as bid-ask spreads, brokerage commissions, and margin interest.
  - In addition, there might be some short-sale constraints.
    - One short-sale constraint arises when there are not enough shares to borrow.
    - This means the arbitrageur cannot take a large short position.
  - Another short-sale constraint stems from the legal restriction that many money managers are not allowed to sell short.
    - pension fund managers
    - mutual fund managers
- When firm specific risk, noise trader risk, or implementation costs are present, a mispricing may persist because arbitrage is too risky or too costly.
- Collectively, these risks and costs create barriers, or limits, to arbitrage.
- How important these limits are is difficult to say, but we do know that mispricings occur, at least on occasion.

# Sentiment-Based Risk and Limits to Arbitrage, IV.

- In 1907, Royal Dutch of the Netherlands and Shell of the UK agreed to merge and split profits on a 60-40 basis.
- So, if the stock prices of Royal Dutch and Shell are not in a 60-40 ratio, there is a potential arbitrage opportunity.
- The next slide contains a plot of the daily deviations from the 60-40 ratio of the Royal Dutch price to the Shell price.
  - If the prices are in a 60-40 ratio, there is no deviation.
  - If there is a positive deviation, the price of Royal Dutch is too high.
  - If there is a negative deviation, the price of Royal Dutch is too low.
- As you can see, there have been large (and persistent) deviations from the 60-40 ratio.

# Sentiment-Based Risk and Limits to Arbitrage, V.



# Technical Analysis

## A brief Introduction

# Technical Analysis

- Many investors try to predict future stock price movements based on investor sentiment, errors in judgment, and/or historical prices.
- These investors are using **technical analysis**.
- **Technical analysis** differs significantly from **fundamental analysis**.
- Unlike fundamental analysis, technical analysis does not rely on traditional stock valuation techniques.

Technical analysts essentially search for **bullish** (positive) and **bearish** (negative) signals about stock prices or market direction.

# Why Does Technical Analysis Continue to Thrive?

- Proponents of the Efficient Markets Hypothesis do not believe that technical analysis can help investors predict future stock prices.
- In this Internet and computer age, technical analysis is actually thriving. Why?
- One possible reason: investors can derive thousands of successful technical analysis systems by using historical security prices.
  - Past security prices easily fit into a wide variety of technical systems.
  - Technicians can continuously tinker and find methods that fit past prices.
  - This process is known as “backtesting.” (But, investment success is all about future prices.)
- Another possible reason: technical analysis simply sometimes works.
  - Again, there are a large number of possible technical analysis systems.
  - Many of them will appear to work in the short run.

# The Market Sentiment Index, I.

- **Market Sentiment** The prevailing mood among investors about the future outlook for an individual security or for the market.
  - Market sentimentalists often believe that once 80% of the investors are bullish or bearish, a "consensus" has been reached.
  - Once a consensus is reached, market sentimentalists believe there is an impending turn in the direction of the market.
  - One way to measure market sentiment is to ask investors whether they think the market is going up or down.

- 50 investors are asked whether they are "bullish" or "bearish" on the market over the next month—20 say "bearish."

- The Market Sentiment Index (MSI) can then be calculated as:

$$\text{MSI} = \frac{\text{Number of Bearish Investors}}{\text{Number of Bullish Investors} + \text{Number of Bearish Investors}}$$

$$\text{MSI} = \frac{20}{30 + 20} = 0.40.$$

# The Market Sentiment Index, II.

- The MSI has a maximum value of 1.00, which occurs when every investor you ask is bearish on the market.
- The MSI has a minimum value of 0.00, which occurs when every investor you ask is bullish on the market.
- This saying is handy when you are trying to remember how to use the MSI: "**When the MSI is high, it is time to buy**; **when the MSI is low, it is time to go**."
- Note that there is not a theory to guide investors as to what level of the MSI is "high," and what level is "low."
- This lack of precise guidance is a common problem with a technical indicator like the MSI.

# Dow Theory

- The Dow theory is a method that attempts to interpret and signal changes in the stock market direction.
  - Dates to turn of the 20th century.
  - Named after Charles Dow (co-founder of the Dow Jones Co.)
- The Dow theory identifies three forces:
  - a primary direction or trend,
  - a secondary reaction or trend, and
  - daily fluctuations.

***(The Trend is your Friend…)***

- Daily fluctuations are essentially noise and are of no real importance.
- Dow Theory is less popular today, but its basic principles underlie more contemporary approaches to technical analysis.

# Elliott Waves

- Invented in the 1930's by Ralph Nelson Elliott, A Dow Theorist.
- Mr. Elliott's theory was that repeating stock price patterns, which he called "waves," collectively expressed investor sentiment.
- Mr. Elliott believe that by using sophisticated "wave counting" techniques, a wave theorist could forecast market turns accurately.
- *The Elliott Wave Principle.*
  - There is a repeating eight wave sequence.
  - The first five waves are "impulse" waves.
  - The next three-waves are a "corrective" sequence.
- Still a widely-followed indicator.

# Support and Resistance Levels

- A ***support level*** is a price or level below which a stock or the market as a whole is unlikely to go.
- A ***resistance level*** is a price or level above which a stock or the market as a whole is unlikely to rise.
- Support and resistance levels are "**psychological barriers**:"
  - bargain hunters help "support" the lower level.
  - profit takers "resist" the upper level.
- A "**breakout**" occurs when a stock (or the market) passes through either a support or a resistance level.

# Market Diaries, A Collection of Technical Indicators

## Markets Diary: Closing Snapshot

### DIARIES

GO TO: Volume by Market | Breakdown of Volume | Crossing Session

DOWNLOAD WEEKLY TOTALS (updated Friday)

Monday, October 01, 2007 — Find Historical Data | WHAT'S THIS?

| NYSE | Latest close | % Chg from 65-day avg | Previous close | Week ago |
|---|---|---|---|---|
| Issues traded | 3,396 | –0.6 | 3,414 | 3,411 |
| Advances | 2,511 | 53.5 | 1,487 | 1,297 |
| Declines | 809 | –52.1 | 1,831 | 2,029 |
| Unchanged | 76 | -15.7 | 96 | 85 |
| New highs | 288 | 184.8 | 173 | 148 |
| New lows | 32 | –80.7 | 43 | 50 |
| Adv. volume* | 1,141,184,280 | 44.2 | 498,033,600 | 461,733,310 |
| Decl. volume* | 266,575,270 | –68.3 | 786,510,950 | 870,383,650 |
| Total volume* | 1,415,268,850 | –14.3 | 1,306,133,650 | 1,341,874,770 |
| Closing tick | +817 | ... | +568 | +418 |
| Closing Arms (TRIN)† | 0.73 | ... | 1.28 | 1.20 |
| Block trades* | n.a. | ... | 4,801 | 4,433 |

# Technical Indicators, Notes

- The “advance/decline line” shows, for some period, the cumulative difference between advancing and declining issues.
- “Closing tick” is the difference between the number of shares that closed on an uptick and those that closed on a downtick.
- “Closing arms” or “trin” (trading index) is the ratio of average trading volume in declining issues to average trading volume in advancing issues. Using data from the “Previous Close:”

$$\text{Arms} = \frac{266{,}575{,}270/809}{1{,}141{,}184{,}280/2{,}511} = \frac{329{,}512}{454{,}474} = 0.73$$

# Relative Strength

- *Relative strength* measures the performance of one investment relative to another.

- Comparing stock A to stock B, through relative strength:

| Month | Stock A (4 Shares) | Stock B (2 Shares) | Relative Strength |
|---|---|---|---|
| 1 | $100 | $100 | 1.00 |
| 2 | 96 | 96 | 1.00 |
| 3 | 88 | 90 | 0.98 |
| 4 | 88 | 80 | 1.10 |
| 5 | 80 | 78 | 1.03 |
| 6 | 76 | 76 | 1.00 |

# Charting

- Technical analysts rely heavily on charts that show recent market prices.
- Technical analysis is sometimes called "**charting**."
- Technical analysts are often called "**chartists**."
- Chartists study graphs (or charts) of past market prices (or other information).
- Chartists try to identify particular patterns known as chart formations.
- Chart formations are thought to signal the direction of future prices.

# Charting: Open-High-Low-Close (OHLC)

# Charting: Price Channels

# Charting: Head and Shoulders

# Charting: Moving Averages

- **Moving average charts** are average daily prices or index levels, calculated using a fixed number of previous prices, updated daily.
- Because daily price fluctuations are “smoothed out,” these charts are used to identify trends.
- Example: Suppose the technical trader calculates a 15-day and a 50-day moving average of a stock price.
  - If the 15-day crosses the 50-day from above, it is a bearish signal—time to sell.
  - If the 15-day crosses the 50-day from below, it is a bullish signal—time to buy.

# That’s all folks!... the editor