



# **ARE 415: Introduction to Commodity Futures Markets**

*Lecture 20: Technical Analysis*

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# What is Technical Analysis?

- ❑ **Technical Analysis:** Is the study of historical market prices, volumes, open interest, and price volatility
- ❑ Technicians (sometimes called *chartists*) are only interested in the price movements in the market
- ❑ Examining history of the above-mentioned variables will reveal implicit signals regarding the psychology of the market
  - ❑ The “strength” or “weakness” of a recent price move
- ❑ Technicians study the past behavior of the market itself, *rather than external supply and demand*
- ❑ The charting techniques used by futures and options chartists originate and have been borrowed from stock market chartists
  - ❑ Does not require experience, knowledge, or understanding of the economics of the underlying commodity



# Fundamental vs. Technical Analysis

- A ***fundamental analyst*** look forward examining expected supply and demand conditions and analyzing what this information means for forthcoming prices. Fundamental analysis is more difficult as there is more information to evaluate and models tend to be more complex.
- A ***technical analyst*** looks backward in time. This approach examines historical market prices (using moving averages, trends, strength indexes), historical volume, and open interest. Technical analysis is more easy with trading rules that can be quickly applied and do not require any background understanding of the market.



# Fundamental vs. Technical Analysis...

- ❑ Two different approaches; each with its own pro's and con's; Some say neither is better than the other; others have strong opinions either way.
- ❑ Objectively, it is probably best to understand both and employ a combination of the two to make decisions.



# What is the 'Efficient Market Hypothesis–EMH

- ❑ The efficient market hypothesis (EMH) is theory that states it is impossible to "beat the market" because market efficiency causes commodity prices to always incorporate and reflect all relevant information.
- ❑ According to the EMH, commodities always trade at their fair value on exchanges, making it impossible for traders to either purchase undervalued undervalued commodities or sell commodities for inflated prices.
- ❑ It should be impossible to profit from the overall market through expert commodity selection or market timing and that the only way a trader can possibly obtain higher returns is by taking risky investments.
- ❑ There is some dissension about whether EMH exists.
  - ❑ academics point to a large body of evidence in support of EMH
  - ❑ Some investors and traders, have consistently beaten the market over long periods of time, which by definition is impossible according to the EMH.
  - ❑ Detractors of the EMH also point to events, such as the 1987 stock market crash when the DJIA fell by over 20% in a single day, as evidence that stock prices can seriously deviate from their fair values.



# Technical Analyst–Some Basic Rules

- ❑ StockCharts.com's Chief Technical Analyst, John Murphy, is a very popular author on the subject of Technical Analysis. His “Ten Laws of Technical Trading” is a collection of recommendations for those new to Technical Analysis.
- ❑ Murphy’s ten most important rules of technical trading:
  1. Map the trends
  2. Spot the trend and go with it
  3. Find the low and high of it
  4. Know how far to backtrack
  5. Draw the line
  6. Follow that Average
  7. Learn the turns
  8. Know the Warning Signs
  9. Trend or Not a Trend
  10. Know the Confirming Signs



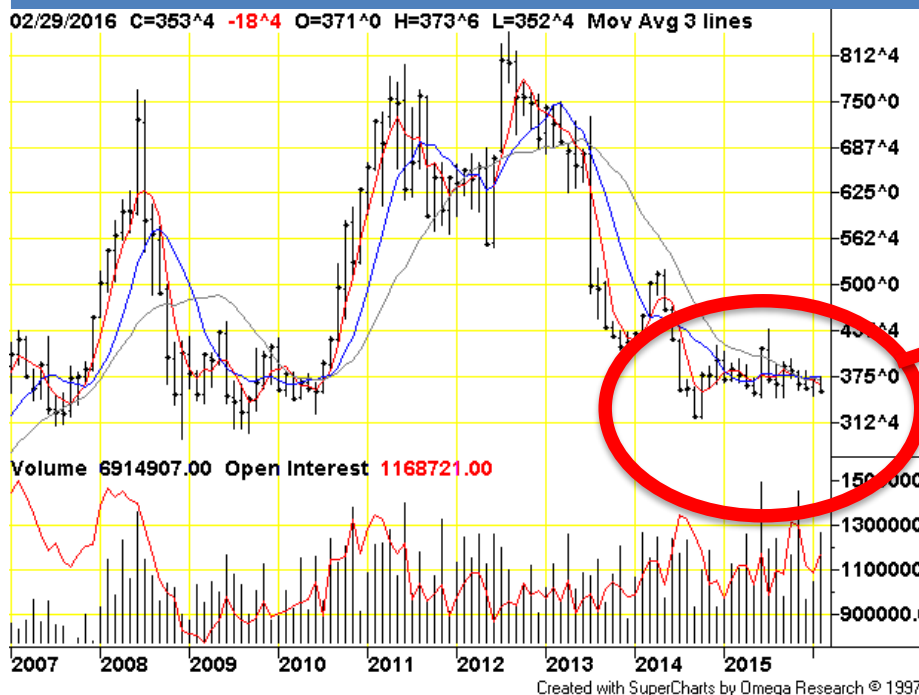
# 1. Map The Trends

- ❑ **Study long-term charts.** Begin a chart analysis with monthly and weekly charts spanning several years.
- ❑ A larger scale map of the market provides more visibility and a better long-term perspective on a market.
- ❑ A short-term market view alone can often be deceptive.
- ❑ Even if you only trade the very short term, you will do better if you're trading in the same direction as the intermediate and longer term trends.

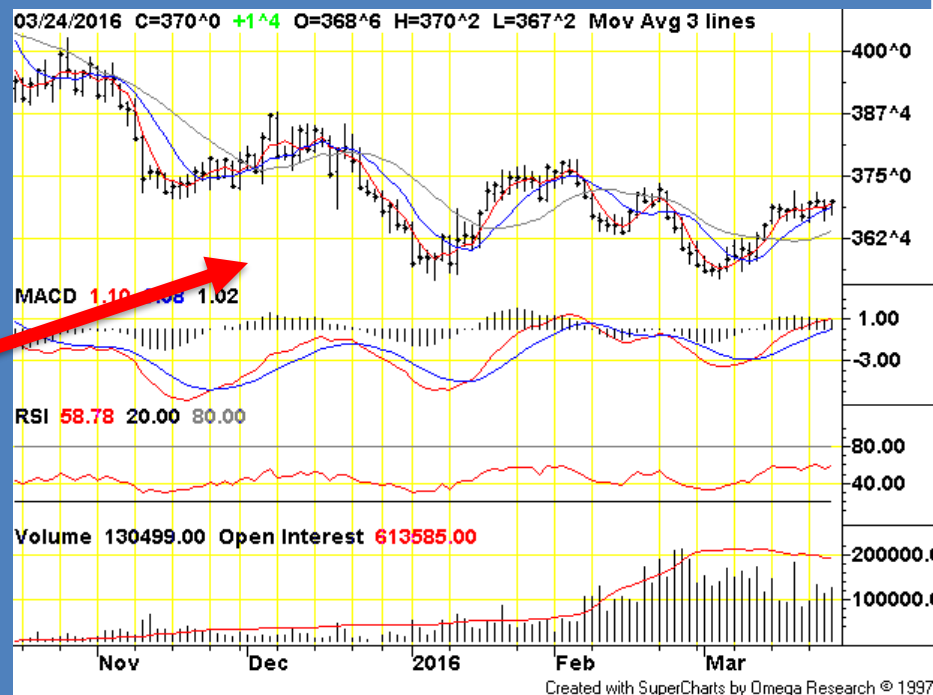


# 1. Map The Trends....

## Long Term Chart: Corn (Dec 2016) Monthly



## Short Term Chart: Corn (Dec 2016) Daily







## 2. Spot the Trends and Go With It

- ❑ **Determine the trend and follow it.** Market trends come in many sizes – long-term, intermediate-term and short-term.
  - ❑ You sometimes here the term “THE TREND IS YOUR FRIEND”
- ❑ First, determine which one you're going to trade and use the appropriate chart. Make sure you trade in the direction of that trend.
- ❑ Buy dips if the trend is up.
- ❑ Sell rallies if the trend is down.
- ❑ If you're trading the intermediate trend, use daily and weekly charts.
- ❑ If you're day trading, use daily and intra-day charts. But in each case, let the longer range chart determine the trend, and then use the shorter term chart for timing.



## 3. Find the Low and High of It

- ❑ **Find support and resistance levels.** The best place to buy in a market is near *support* levels.
- ❑ That support is usually a previous reaction low.
- ❑ The best place to sell a market is near a *resistance* levels.
- ❑ Resistance is usually a previous peak. After a resistance peak has been broken, it will usually provide support on subsequent pullbacks. In other words, the old “high” becomes the new low.
- ❑ In the same way, when a support level has been broken, it will usually produce selling on subsequent rallies – the old “low” can become the new “high.”.



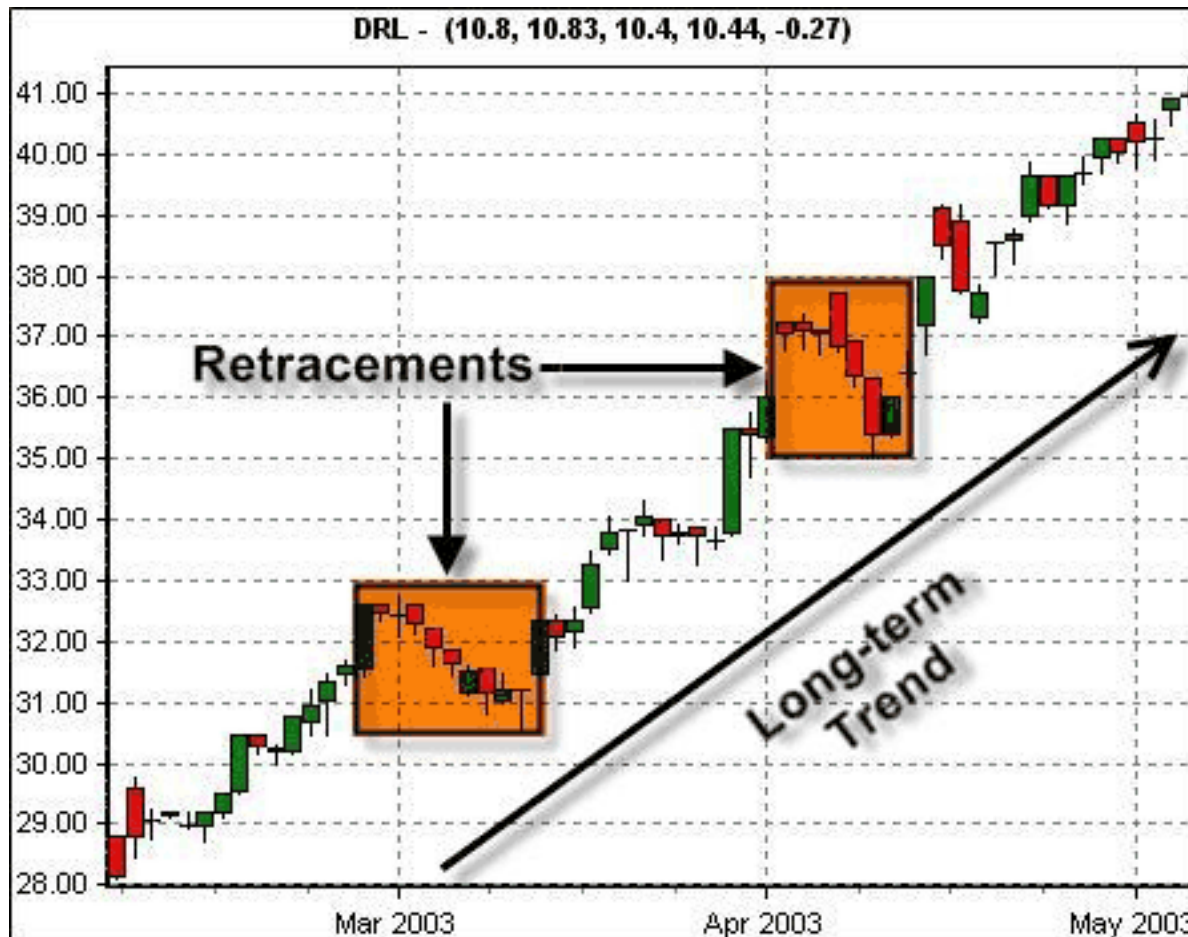
## 4. Know How Far to Backtrack

- ❑ **Measure percentage retracements.** Market corrections up or down usually retrace a significant portion of the previous trend.
- ❑ You can measure the corrections in an existing trend in simple percentages.
- ❑ Retracements are temporary price reversals that take place within a larger trend. The key here is that these price reversals are temporary, and do not indicate a change in the larger trend.
- ❑ A fifty percent retracement of a prior trend is most common.
  - A minimum retracement is usually one-third of the prior trend.
  - The maximum retracement is usually two-thirds.



# 4. Know How Far to Backtrack...

- ❑ **Measure percentage retracements.** Market corrections up or down usually retrace a significant portion of the previous trend.





## 5. Draw the Line

- Draw trend lines.** Trend lines are one of the simplest and most effective charting tools. All you need is a straight edge and two points on the chart.
- Upward trend lines are drawn along two successive lows.
- Downward trend lines are drawn along two successive peaks.
- Prices will often pull back to trend lines before resuming their trend.
- The breaking of trend lines usually signals a change in trend.
- A valid trend line should be touched at least three times. The longer a trend line has been in effect, and the more times it has been tested, the more important it becomes.



## 5. Draw the Line...

- ❑ An *up trendline* is a straight line drawn up and to the right, connecting successive rising market bottoms.
- ❑ The line is drawn in such a way that all of the price action is above the trendline.
- ❑ While it takes two points to draw a trendline, *a third point is necessary to identify the line as a valid trend line*.
- ❑ If prices in an uptrend dip back down to the trendline a third time and bounce off it, a valid up trendline is confirmed





## 6. Follow That Average

- ❑ **Follow moving averages (MA).** MA's provide objective buy and sell signals. They tell you if the existing trend is still in motion and they help confirm trend changes.
- ❑ MA's do not tell you in advance, however, that a trend change is imminent.
- ❑ A combination chart of two MA is the most popular way of finding trading signals.
  - ❑ Popular choices are 4- and 9-day MA's, 9- and 18-day, 5- and 20-day, 15- and 50-day.
- ❑ Signals are given when the shorter average line crosses the longer.
- ❑ Since moving average chart lines are trend-following indicators, they work best in a trending market.



## 6. Follow that Average...

- ❑ Most chart patterns show a lot of variation in price movement. This can make it difficult to get an idea of an overall trend.
- ❑ One simple method is to apply a moving average (MA). A MA is the average price of a commodity over a set amount of time. By plotting the average price, the price movement is smoothed out.
- ❑ A signal of a trend reversal is when one moving average crosses through another. For example, if the 15-day moving average crosses above the 50-day moving average, it is a positive sign that the price will start to increase.

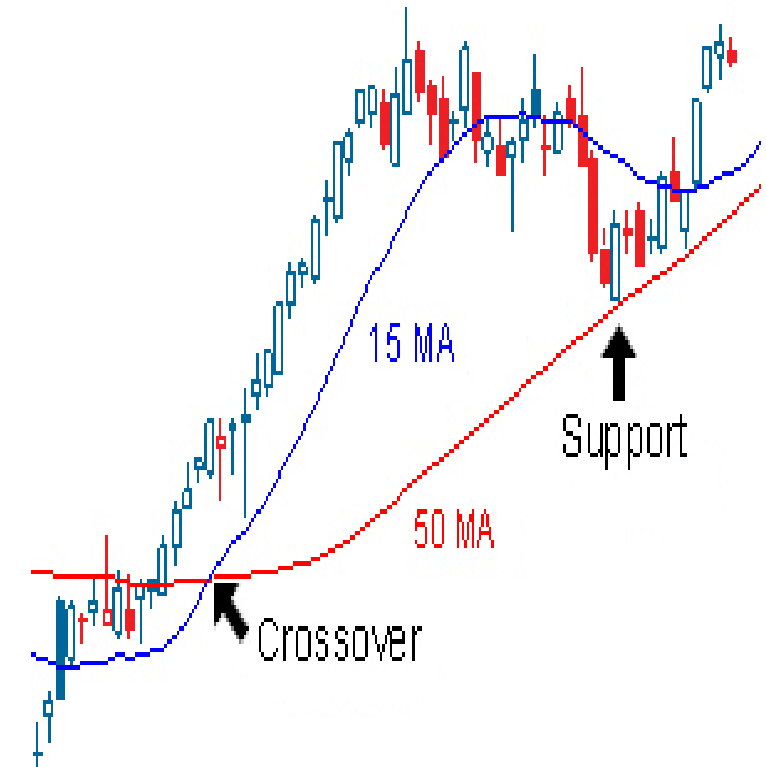


Chart by MetaStock

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## 7. Learn the Turns

- ❑ **Track oscillators.** Oscillators help identify overbought and oversold markets. While MA's offer confirmation of a market trend change, *oscillators* often help warn us in advance that a market has rallied or fallen too far and will soon turn.
- ❑ Two of the most popular which both work on a scale 0 to 100:
  1. **Relative Strength Index (RSI)**
    - With the RSI, readings over 70 are overbought while readings below 30 are oversold.
    - Most traders use 9 or 14 days for RSI
  2. **Stochastic Oscillator (SO)**
    - With the SO, readings over 80 are overbought while readings below 20 are oversold.
    - Most traders use 14 days or weeks for SO
- ❑ Oscillator divergences often warn of market turns.



## 7. Learn the Turns....

- **RSI** developed J. Welles Wilder is a momentum oscillator that measures the speed and change of price movements. Signals can also be generated by looking for divergences, failure swings and centerline crossovers. RSI can also be used to identify the general trend.

$$RSI = 100 - \left[ \frac{100}{1 + RS} \right]$$

where

$RS = \text{Average Gain} / \text{Average Loss}$

The very first calculations for average gain and average loss are simple 14 period averages.

First Average Gain = Sum of Gains over the past 14 periods / 14.

First Average Loss = Sum of Losses over the past 14 periods / 14

The second, and subsequent, calculations are based on the prior averages and the current gain loss:

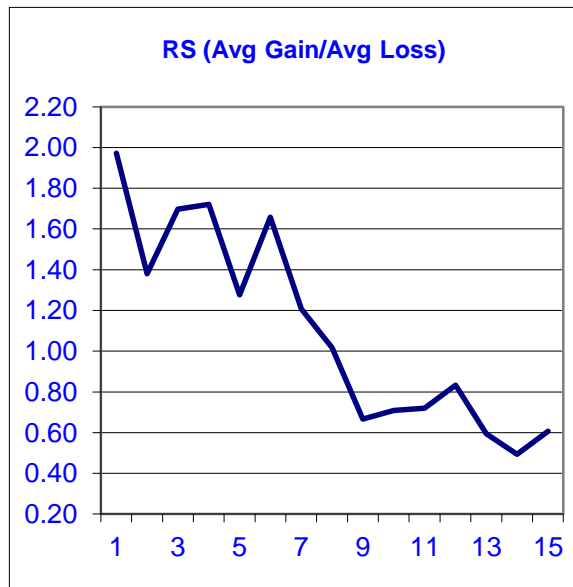
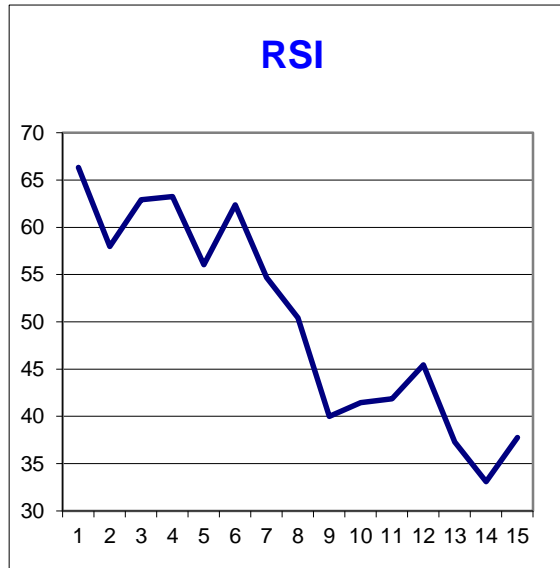
Average Gain = [(previous Average Gain) x 13 + current Gain] / 14.

Average Loss = [(previous Average Loss) x 13 + current Loss] / 14.



# Example of Calculating RSI

|    | Date      | QQQQ Close | Change | Gain | Loss | Avg Gain | Avg Loss | RS   | 14-day RSI |
|----|-----------|------------|--------|------|------|----------|----------|------|------------|
| 1  | 14-Dec-09 | 44.34      |        |      |      |          |          |      |            |
| 2  | 15-Dec-09 | 44.09      | -0.25  |      | 0.25 |          |          |      |            |
| 3  | 16-Dec-09 | 44.15      | 0.06   | 0.06 |      |          |          |      |            |
| 4  | 17-Dec-09 | 43.61      | -0.54  |      | 0.54 |          |          |      |            |
| 5  | 18-Dec-09 | 44.33      | 0.72   | 0.72 |      |          |          |      |            |
| 6  | 21-Dec-09 | 44.83      | 0.50   | 0.50 |      |          |          |      |            |
| 7  | 22-Dec-09 | 45.10      | 0.27   | 0.27 |      |          |          |      |            |
| 8  | 23-Dec-09 | 45.42      | 0.33   | 0.33 |      |          |          |      |            |
| 9  | 24-Dec-09 | 45.84      | 0.42   | 0.42 |      |          |          |      |            |
| 10 | 28-Dec-09 | 46.08      | 0.24   | 0.24 |      |          |          |      |            |
| 11 | 29-Dec-09 | 45.89      | -0.19  |      | 0.19 |          |          |      |            |
| 12 | 30-Dec-09 | 46.03      | 0.14   | 0.14 |      |          |          |      |            |
| 13 | 31-Dec-09 | 45.61      | -0.42  |      | 0.42 |          |          |      |            |
| 14 | 4-Jan-10  | 46.28      | 0.67   | 0.67 |      |          |          | RS   | RSI        |
| 15 | 5-Jan-10  | 46.28      |        |      |      | 0.24     | 0.10     | 2.39 | 70.53      |
| 16 | 6-Jan-10  | 46.00      | -0.28  |      | 0.28 | 0.22     | 0.11     | 1.97 | 66.32      |
| 17 | 7-Jan-10  | 46.03      | 0.03   | 0.03 |      | 0.21     | 0.10     | 1.99 | 66.55      |
| 18 | 8-Jan-10  | 46.41      | 0.38   | 0.38 |      | 0.22     | 0.10     | 2.27 | 69.41      |
| 19 | 11-Jan-10 | 46.22      | -0.19  |      | 0.19 | 0.20     | 0.10     | 1.97 | 66.36      |
| 20 | 12-Jan-10 | 45.64      | -0.58  |      | 0.58 | 0.19     | 0.14     | 1.38 | 57.97      |
| 21 | 13-Jan-10 | 46.21      | 0.57   | 0.57 |      | 0.22     | 0.13     | 1.70 | 62.93      |
| 22 | 14-Jan-10 | 46.25      | 0.04   | 0.04 |      | 0.20     | 0.12     | 1.72 | 63.26      |
| 23 | 15-Jan-10 | 45.71      | -0.54  |      | 0.54 | 0.19     | 0.15     | 1.28 | 56.06      |
| 24 | 19-Jan-10 | 46.45      | 0.74   | 0.74 |      | 0.23     | 0.14     | 1.66 | 62.38      |
| 25 | 20-Jan-10 | 45.78      | -0.67  |      | 0.67 | 0.21     | 0.18     | 1.21 | 54.71      |
| 26 | 21-Jan-10 | 45.35      | -0.43  |      | 0.43 | 0.20     | 0.19     | 1.02 | 50.42      |
| 27 | 22-Jan-10 | 44.03      | -1.33  |      | 1.33 | 0.18     | 0.27     | 0.67 | 39.99      |
| 28 | 25-Jan-10 | 44.18      | 0.15   | 0.15 |      | 0.18     | 0.26     | 0.71 | 41.46      |
| 29 | 26-Jan-10 | 44.22      | 0.04   | 0.04 |      | 0.17     | 0.24     | 0.72 | 41.87      |
| 30 | 27-Jan-10 | 44.57      | 0.35   | 0.35 |      | 0.18     | 0.22     | 0.83 | 45.46      |
| 31 | 28-Jan-10 | 43.42      | -1.15  |      | 1.15 | 0.17     | 0.29     | 0.59 | 37.30      |
| 32 | 29-Jan-10 | 42.66      | -0.76  |      | 0.76 | 0.16     | 0.32     | 0.49 | 33.08      |
| 33 | 1-Feb-10  | 43.13      | 0.47   | 0.47 |      | 0.18     | 0.30     | 0.61 | 37.77      |



Note: The smoothing process affects RSI values. RS values are smoothed after the first calculation. Average Loss equals the sum of the losses divided by 14 for the first calculation. Subsequent calculations multiply the prior value by 13, add the most recent value and then divide the total by 14. This creates a smoothing affect. The same applies to Average Gain. Because of this smoothing, RSI values may differ based on the total calculation period. 250 periods will allow for smoothing than 30 periods and this will slightly affect RSI values. Stockcharts.com goes back 250-days when possible. If Average Loss equals zero, a "divide by zero" situation occurs for RS and RSI is set to 100 by definition. Similarly, RSI equals 0 when Average Gain equals zero.



# Using RSI–Overbought

- ❑ **Overbought:** A technical condition that occurs when prices are considered too high and susceptible to a decline. Overbought conditions can be classified by analyzing the chart pattern or with indicators such as the Relative Strength Index (RSI).
- ❑ A commodity is considered overbought when the Relative Strength Index (RSI) exceeds 70. It is important to keep in mind that overbought is not necessarily the same as being bearish. It merely infers that the stock has risen too far too fast and might be due for a pullback





## 8. Know the Warning Signs

- Trade the MACD indicator.** The MA Convergence Divergence (MACD) combines a moving average crossover system with the overbought/oversold elements of an oscillator.
- A buy signal occurs when the faster line crosses above the slower and both lines are below zero.
- A sell signal takes place when the faster line crosses below the slower from above the zero line.
- Weekly signals take precedence over daily signals.
- An MACD histogram plots the difference between the two lines and gives even earlier warnings of trend changes. It's called a “histogram” because vertical bars are used to show the difference between the two lines on the chart.



# Using MACD—Trends & Momentum

- ❑ The MACD turns two trend-following indicators, MA's, into a momentum oscillator by subtracting the longer moving average from the shorter moving average. As a result, the MACD offers the best of both worlds: **trend following and momentum.**
- ❑ The MACD fluctuates above and below the zero line as the moving averages converge, cross and diverge.
- ❑ Traders can look for signal line crossovers, centerline crossovers and divergences to generate signals. The histogram is positive when the MACD Line is above its Signal line and negative when the MACD Line is below its Signal line.
- ❑ Positive MACD indicates that the **upside momentum is increasing.**
- ❑ Negative MACD indicates that the **downside momentum is increasing.**





## 9. Trend or Not a Trend

- ❑ **Use the ADX indicator.** The Average Directional Movement Index (ADX) line helps determine whether a market is in a trending or a trading phase. It measures the degree of trend or direction in the market.
- ❑ How to calculate ADX:
  - ❑ [https://en.wikipedia.org/wiki/Average\\_directional\\_movement\\_index](https://en.wikipedia.org/wiki/Average_directional_movement_index)
- ❑ A rising ADX line suggests the presence of a strong trend.
- ❑ A falling ADX line suggests the presence of a trading market and the absence of a trend.
- ❑ A rising ADX line favors moving averages; a falling ADX favors oscillators.
- ❑ By plotting the direction of the ADX line, the trader is able to determine which trading style and which set of indicators are most suitable for the current market environment.



# Using ADX Indicator – Trending?

- At its most basic the ADX can be used to determine if a commodity is trending or not. This determination helps traders choose between a trend following system or a non-trend following system. A strong trend is present when ADX is above 25 and no trend is present when below 20. There is a gray zone between 20 and 25.
- 
- This chart shows Nordstrom (JWN) with the 50-day SMA and 14-day Average Directional Index (ADX). The stock moved from a strong uptrend to a strong downtrend in April-May, but ADX remained above 20 because the strong uptrend quickly changed into a strong downtrend. There were two non-trending periods as the stock formed a bottom in February and August. A strong trend emerged after the August bottom as ADX moved above 20 and remained above 20.







# 10. Know the Confirming Signs

- ❑ **Don't ignore volume.** Volume is a very important confirming indicator. *Volume precedes price.*
- ❑ It's important to ensure that heavier volume is taking place in the direction of the prevailing trend.
- ❑ In an uptrend, heavier volume should be seen on up days. Rising volume confirms that new money is supporting the prevailing trend.
- ❑ Declining volume is often a warning that the trend is near completion. A solid price uptrend should always be accompanied by rising volume.



# Final Thoughts

- ❑ **Best of Both Worlds:** There is no definitive answer whether technical analysis can be used as a substitution for fundamental analysis, there is little doubt that combining the strengths of both strategies can help traders better understand the markets and gauge the direction in which commodities might be headed.
- ❑ Traders should consider both analyses when formulating strategies into one market outlook.
- ❑ Market tops and bottoms are progressions which retrospectively may be obvious, but at the time of their occurrence provide no “**ringing bell**” or buzzer to tell you that a major change in direction has occurred. There are no mystical, foolproof indicators that give perfect signals. The ability to recognize a major market change in direction is an evolving thought process that depends on the evidence available.
- ❑ Technical analysis and John Murphy’s 10 rules of trading can be utilized along with fundamental analysis to provide more informed decisions about market trends and timing of buying and selling commodities.



# HWK #10: Technical Analysis of Your Commodity

## (Due 4/5/2018 at start of class)

- Go to the following website: <http://futures.tradingcharts.com>
  1. Using the “Commodity Chart” tab (on the right next to Home) select your assigned commodity. If your assigned commodity is not available pick one of interest.
  2. Select the “chart tab” and choose the nearby contract (under contract month). Next using the “chart term” select and save to a word document the charts for the following terms:
    - a) Daily
    - b) Weekly (continuous)
    - c) Monthly (continuous)
  - d) Using 2a, 2b, and 2c write a paragraph describing the historical trends and current status of the nearby contract. Using such measures as prevailing trends over different time periods, RSI, and volume make a recommendation as to whether you are bullish, bearish, or neutral on your commodity in the future.
  - e) Print off the 3 charts (daily, weekly, and monthly) along with your paragraph and recommendation and hand in a hardcopy stapled at the start of class 4/5/2018.