



# Technical Analysis

# Introduction

- Technical analysis is the attempt to forecast stock prices on the basis of market-derived data.
- Technicians (also known as quantitative analysts or chartists) usually look at price, volume and psychological indicators over time.
- They are looking for trends and patterns in the data that indicate future price movements.

# The Potential Rewards

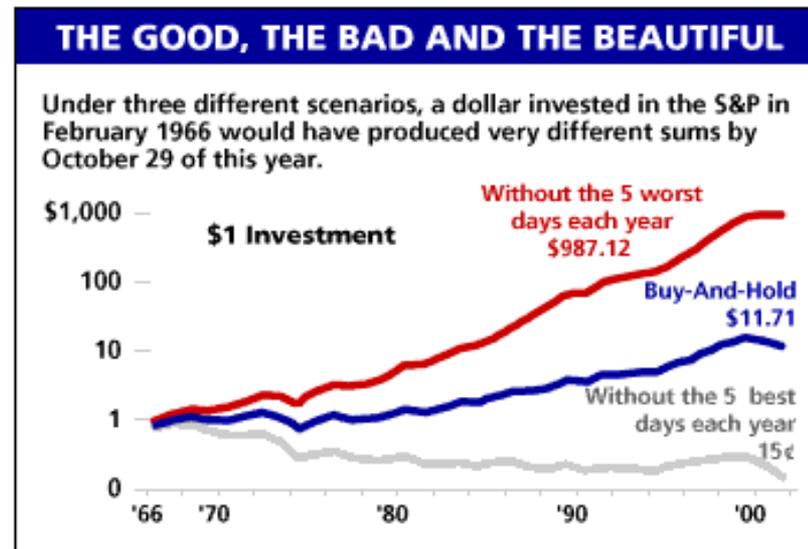
- This chart, from Norman Fosbeck, shows how market timing can benefit your returns. The only problem is that you have to be very good at it.

## Alternative Market Strategies (1964 to 1984)

<b>Strategy</b>	<b>Avg. Annual Gain</b>	<b>\$10,000 Grows To</b>
Buy and Hold	11.46%	\$ 87,500
Avoid Bear Markets	21.48%	\$ 489,700
Long and Short Major Swings	27.99%	\$ 1,391,200
Long and Short Every 5% Swing	93.18%	\$ 5,240,000,000

# The Potential Rewards

- This chart, from Barron's, shows the benefit of being smart enough to miss the worst 5 days of the year between Feb 1966 and Oct 2001.



Source: "The Truth About Timing," by Jacqueline Doherty, Barron's (November 5, 2001)

# Agenda

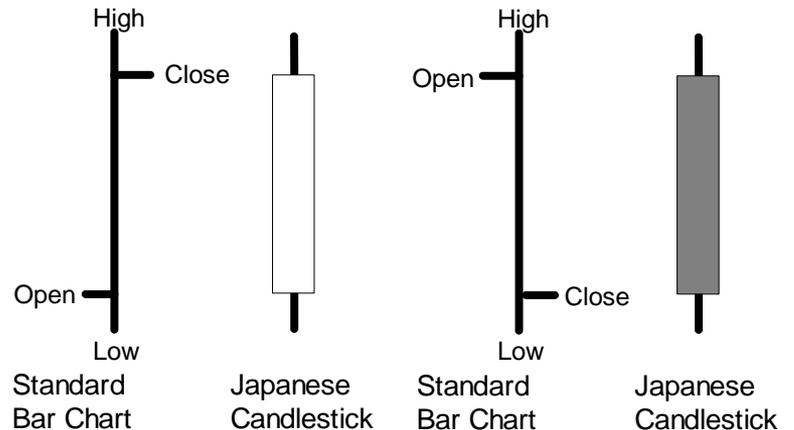
- Charting Stocks
  - Bar Charts and Japanese Candlestick Charts
  - Point and Figure Charts
- Major Chart Patterns
- Price-based Indicators
- Volume-based Indicators
- Dow Theory
- Elliot Wave

# Charting the Market

- Chartists use bar charts, candlestick, or point and figure charts to look for patterns which may indicate future price movements.
- They also analyze volume and other psychological indicators (breadth, % of bulls vs % of bears, put/call ratio, etc.).
- Strict chartists don't care about fundamentals at all.

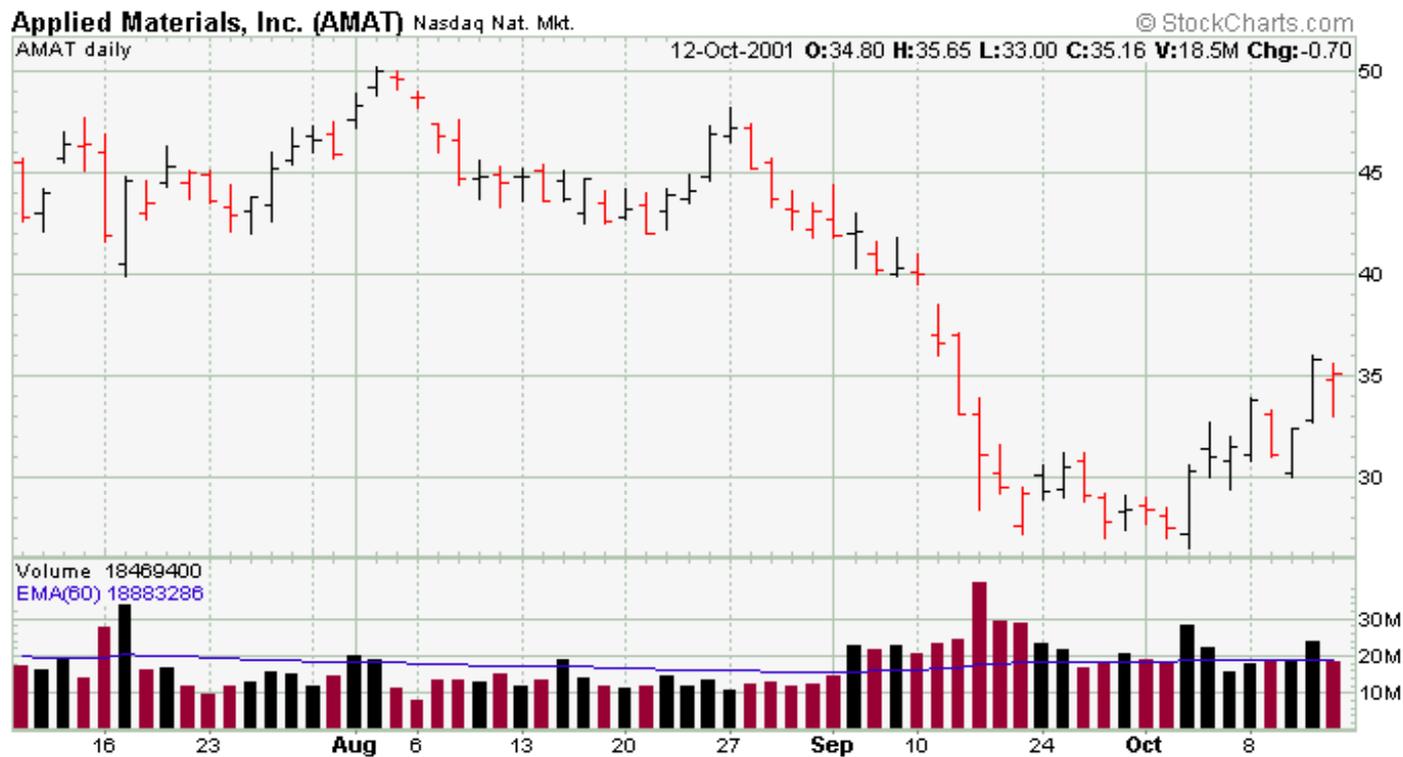
# Drawing Bar (OHLC) Charts

- Each bar is composed of 4 elements:
  - Open
  - High
  - Low
  - Close
- Note that the candlestick body is empty (white) on up days, and filled (some color) on down days
- Note: You should print the example charts (next two slides) to see them more clearly



# Types of Charts: Bar Charts

- This is a bar (open, high, low, close or OHLC) chart of AMAT from early July to mid October 2001.



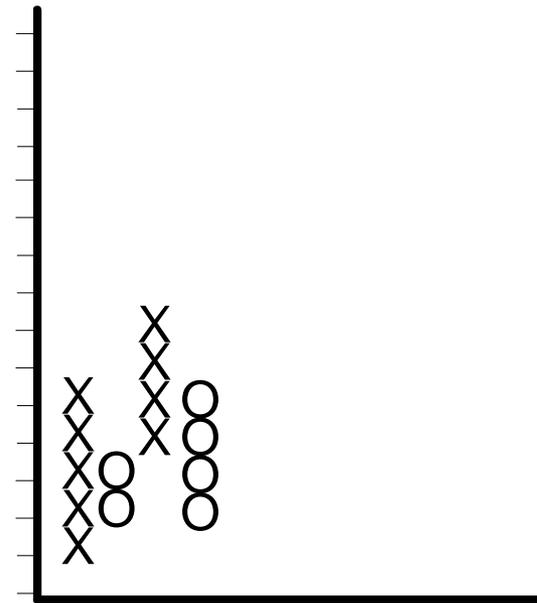
# Types of Charts: Japanese Candlesticks

- This is a Japanese Candlestick (open, high, low, close) chart of AMAT from early July to mid October 2001



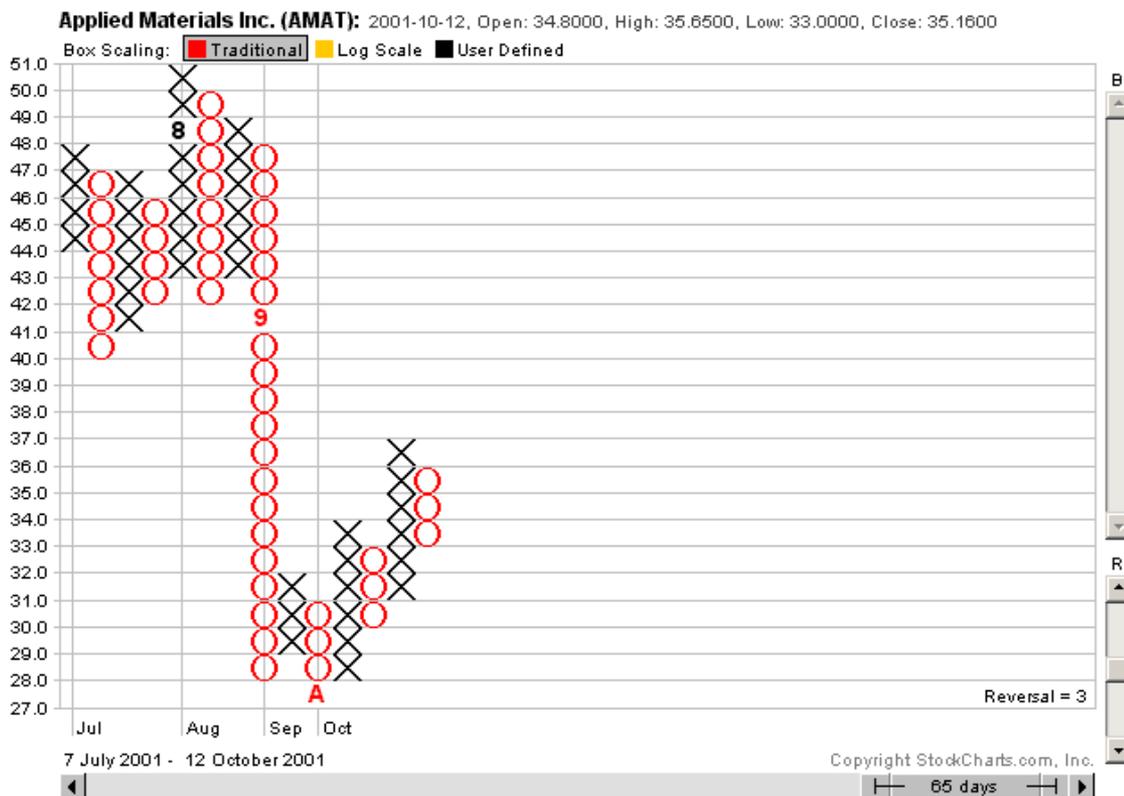
# Drawing Point & Figure Charts

- Point & Figure charts are independent of time.
- An X represents an up move.
- An O represents a down move.
- The Box Size is the number of points needed to make an X or O.
- The Reversal is the price change needed to recognize a change in direction.
- Typically, P&F charts use a 1-point box and a 3-point reversal.



# Chart Types: Point & Figure Charts

- This is a Point & Figure chart of AMAT from early July to mid October 2001.



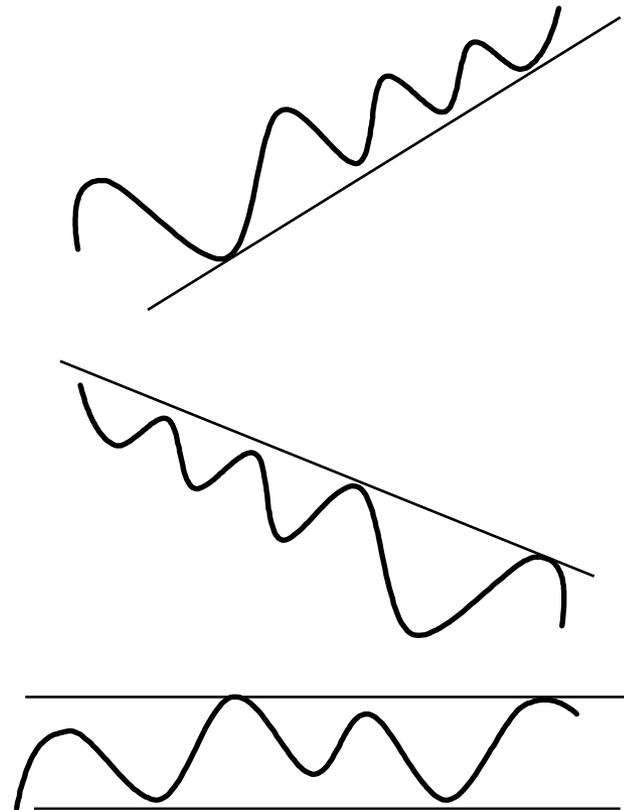
# [ Basic Technical Tools ]

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- Trend Lines
- Moving Averages
- Price Patterns
- Indicators
- Cycles

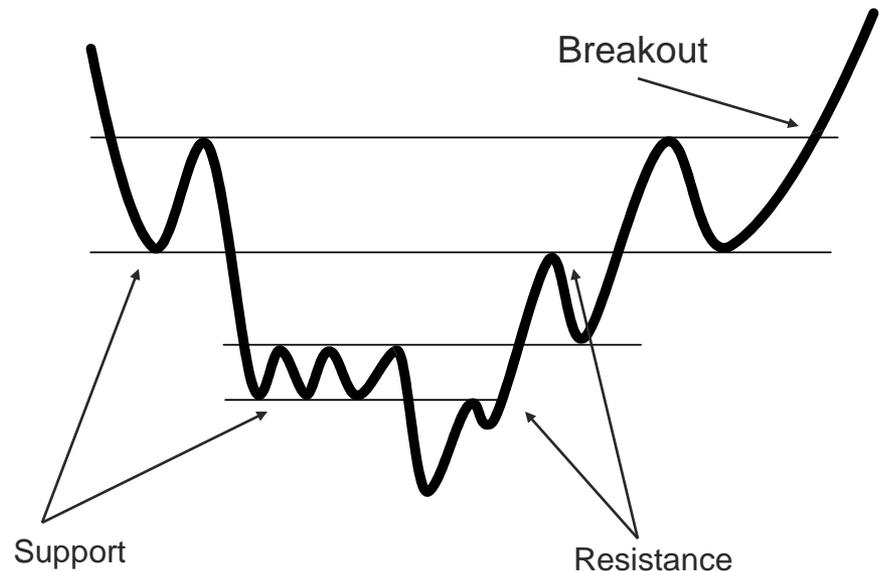
# Trend Lines

- There are three basic kinds of trends:
  - An Up trend where prices are generally increasing.
  - A Down trend where prices are generally decreasing.
  - A Trading Range.



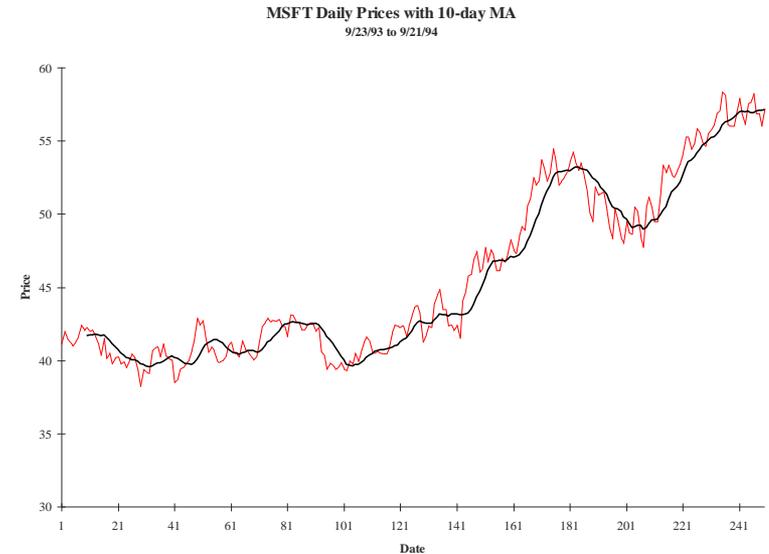
# Support & Resistance

- Support and resistance lines indicate likely ends of trends.
- Resistance results from the inability to surpass prior highs.
- Support results from the inability to break below to prior lows.
- What was support becomes resistance, and vice-versa.



# Simple Moving Averages

- A moving average is simply the average price (usually the closing price) over the last  $N$  periods.
- They are used to smooth out fluctuations of less than  $N$  periods.
- This chart shows MSFT with a 10-day moving average. Note how the moving average shows much less volatility than the daily stock price.

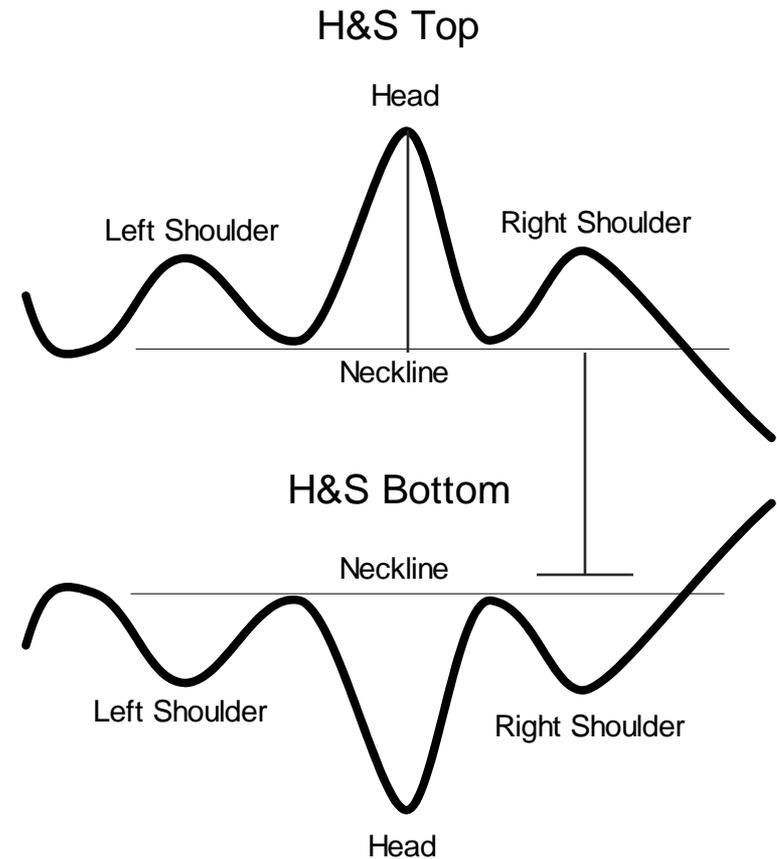


# Price Patterns

- Technicians look for many patterns in the historical time series of prices.
- These patterns are reputed to provide information regarding the size and timing of subsequent price moves.
- But don't forget that the EMH says these patterns are illusions, and have no real meaning. In fact, they can be seen in a randomly generated price series.

# Head and Shoulders

- This formation is characterized by two small peaks on either side of a larger peak.
- This is a reversal pattern, meaning that it signifies a change in the trend.



# Head & Shoulders Example

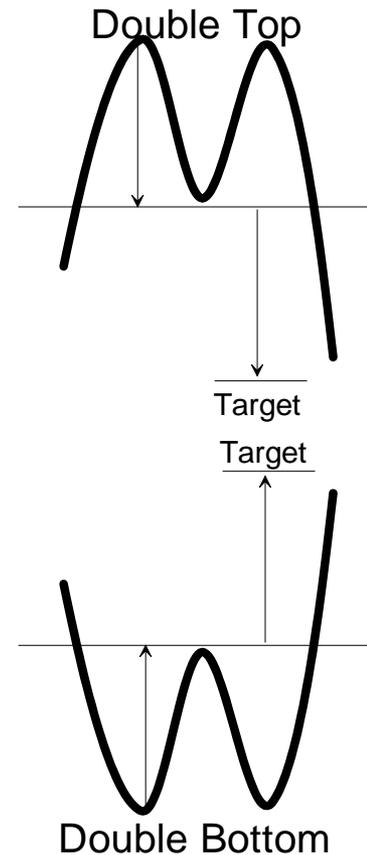
Advanced Micro Dvcs, Inc. (AMD) NYSE

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# Double Tops and Bottoms

- These formations are similar to the H&S formations, but there is no head.
- These are reversal patterns with the same measuring implications as the H&S.

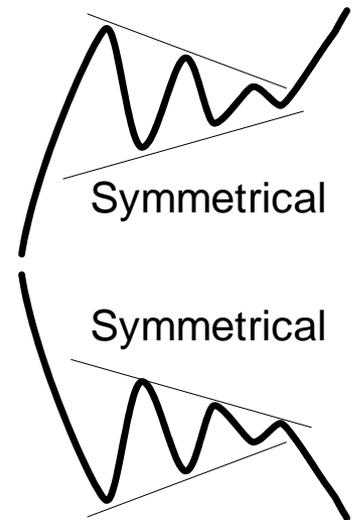
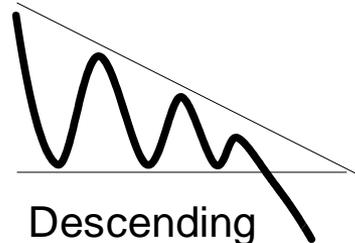
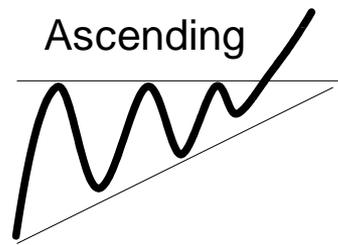


# Double Bottom Example



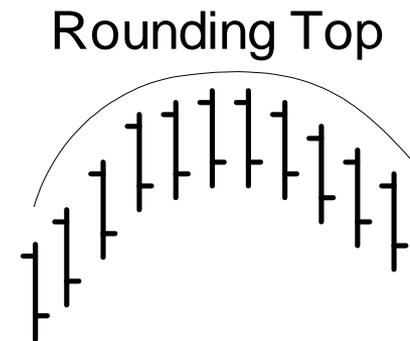
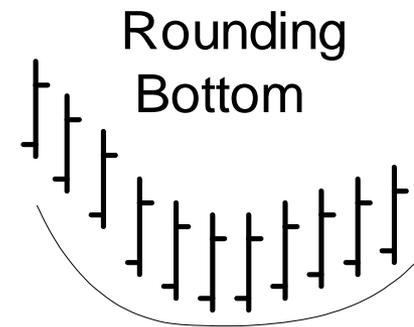
# Triangles

- Triangles are continuation formations.
- Three flavors:
  - Ascending
  - Descending
  - Symmetrical
- Typically, triangles should break out about half to three-quarters of the way through the formation.

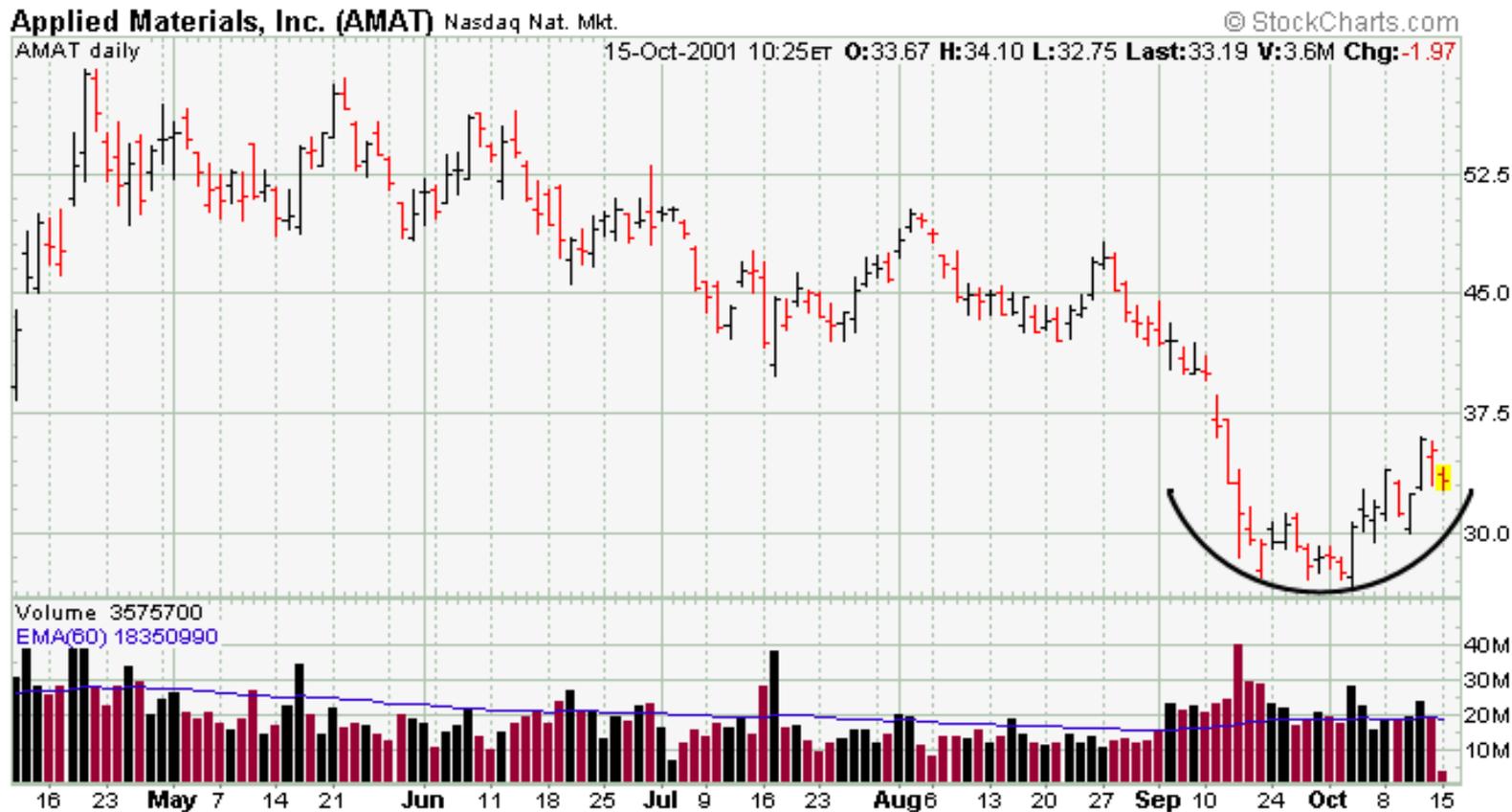


# Rounded Tops & Bottoms

- Rounding formations are characterized by a slow reversal of trend.

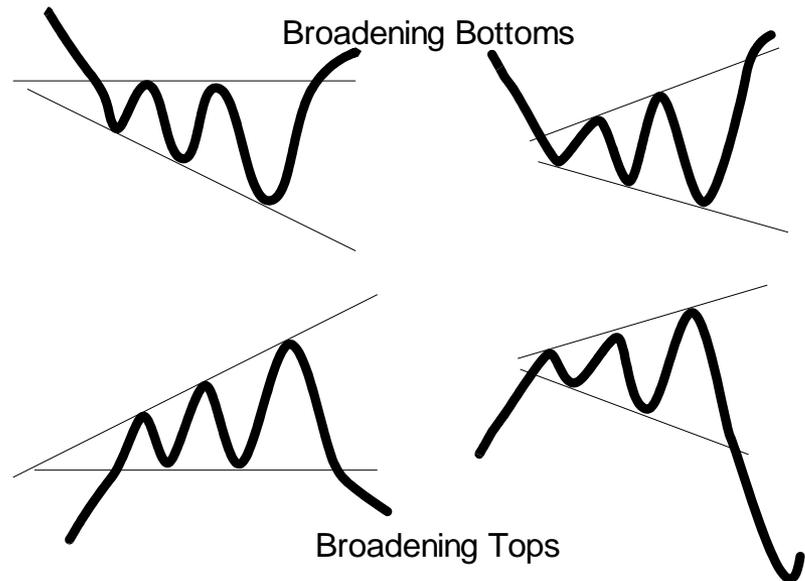


# Rounded Bottom Chart Example



# Broadening Formations

- These formations are like reverse triangles.
- These formations usually signal a reversal of the trend.



# DJIA Oct 2000 to Oct 2001 Example

Dow Jones Industrial Average (\$INDU)

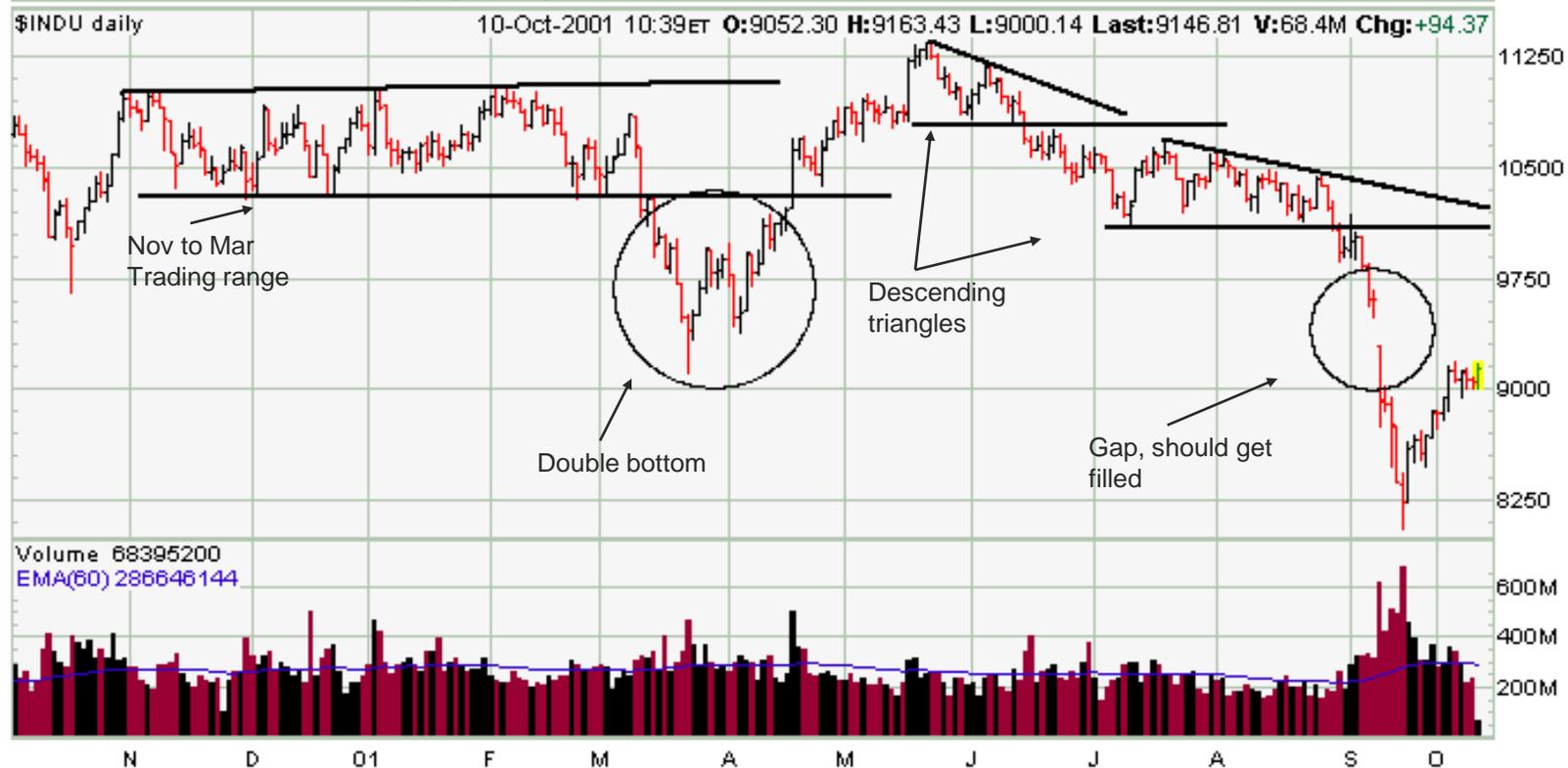
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# DJIA Oct 2000 to Oct 2001 Example

Dow Jones Industrial Average (\$INDU)

© StockCharts.com



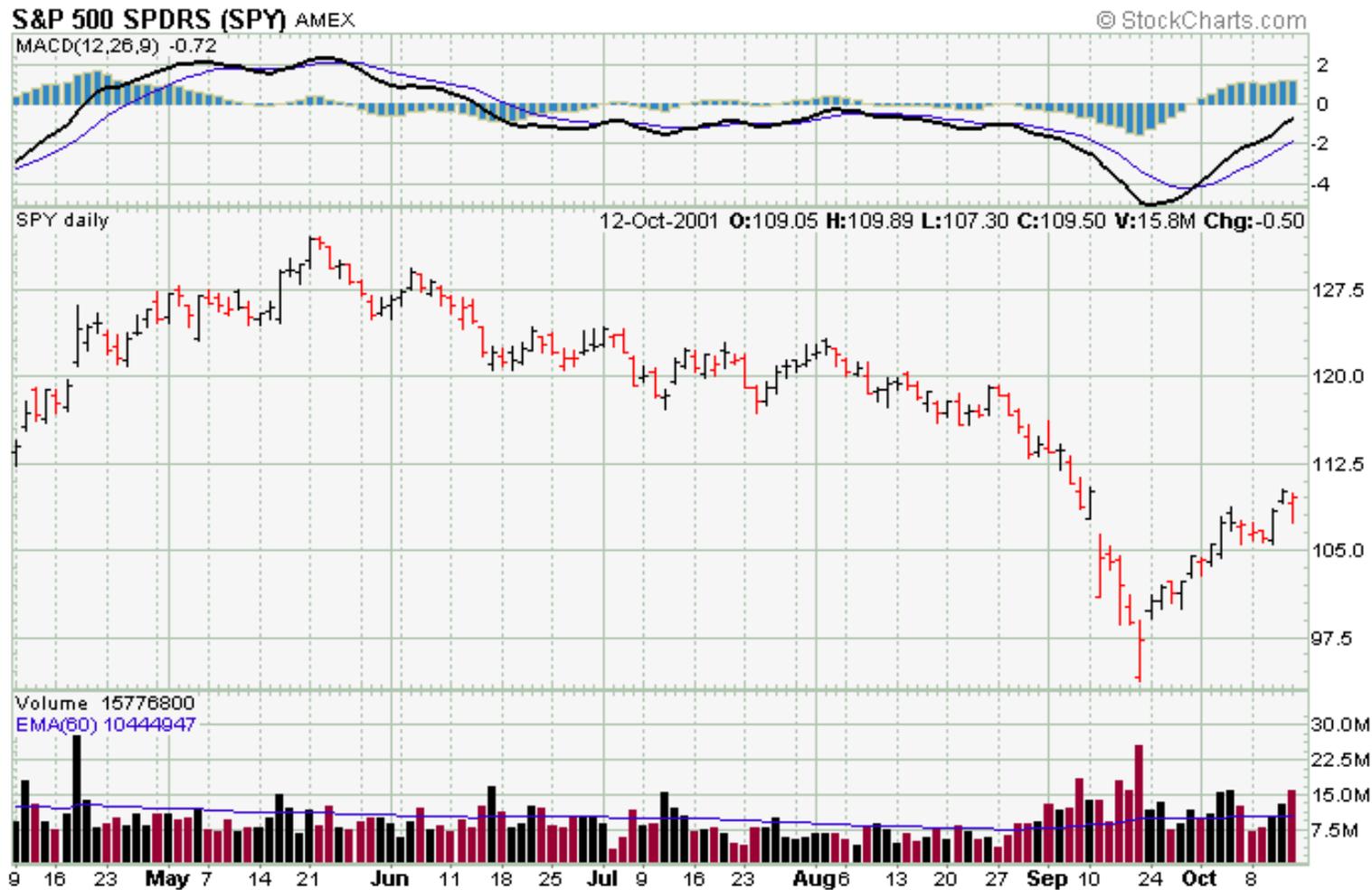
# Technical Indicators

- There are, literally, hundreds of technical indicators used to generate buy and sell signals.
- We will look at just a few that I use:
  - Moving Average Convergence/Divergence (MACD)
  - Relative Strength Index (RSI)
  - On Balance Volume
  - Bollinger Bands
- For information on other indicators see my Investments Class Links page under the heading “Technical Analysis Links.”  
([http://clem.mscd.edu/~mayest/FIN3600/FIN3600\\_Links.htm](http://clem.mscd.edu/~mayest/FIN3600/FIN3600_Links.htm))

# [ MACD ]

- MACD was developed by Gerald Appel as a way to keep track of a moving average crossover system.
- Appel defined MACD as the difference between a 12-day and 26-day moving average. A 9-day moving average of this difference is used to generate signals.
- When this signal line goes from negative to positive, a buy signal is generated.
- When the signal line goes from positive to negative, a sell signal is generated.
- MACD is best used in choppy (trendless) markets, and is subject to whipsaws (in and out rapidly with little or no profit).

# MACD Example Chart



# Relative Strength Index (RSI)

- RSI was developed by Welles Wilder as an oscillator to gauge overbought/oversold levels.
- RSI is a rescaled measure of the ratio of average price changes on up days to average price changes on down days.
- The most important thing to understand about RSI is that a level above 70 indicates a stock is overbought, and a level below 30 indicates that it is oversold (it can range from 0 to 100).
- Also, realize that stocks can remain overbought or oversold for long periods of time, so RSI alone isn't always a great timing tool.

# [ RSI ]

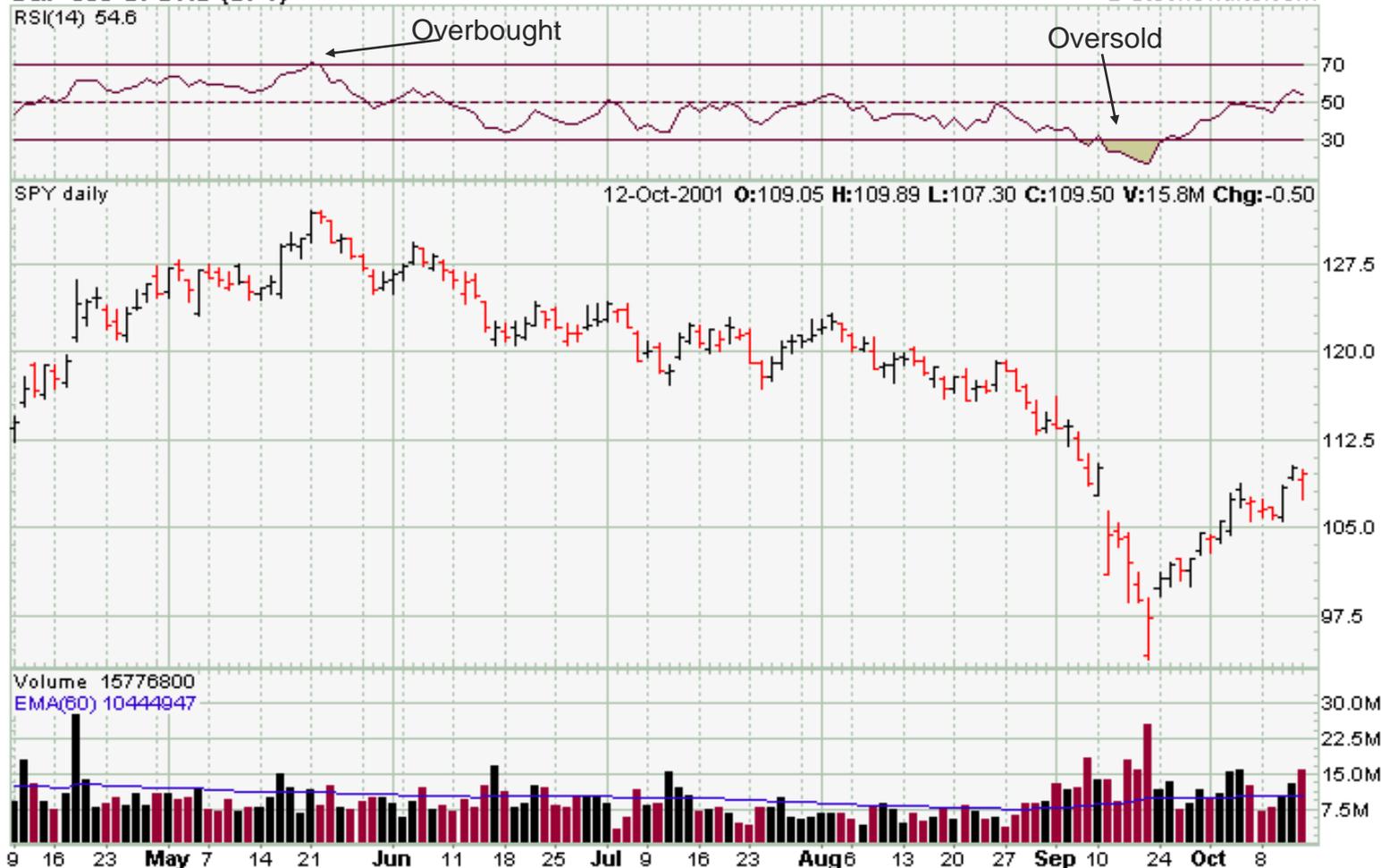
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- a technical analysis tool that is banded between two extreme values and built with the results from a trend indicator for discovering short term overbought and over sold conditions. As the value of the oscillator approach the upper extreme value the asset is seem to be over brought and as it is approaches to be lower extreme as it seems to be over sold.

# RSI Example Chart

S&P 500 SPDRS (SPY) AMEX

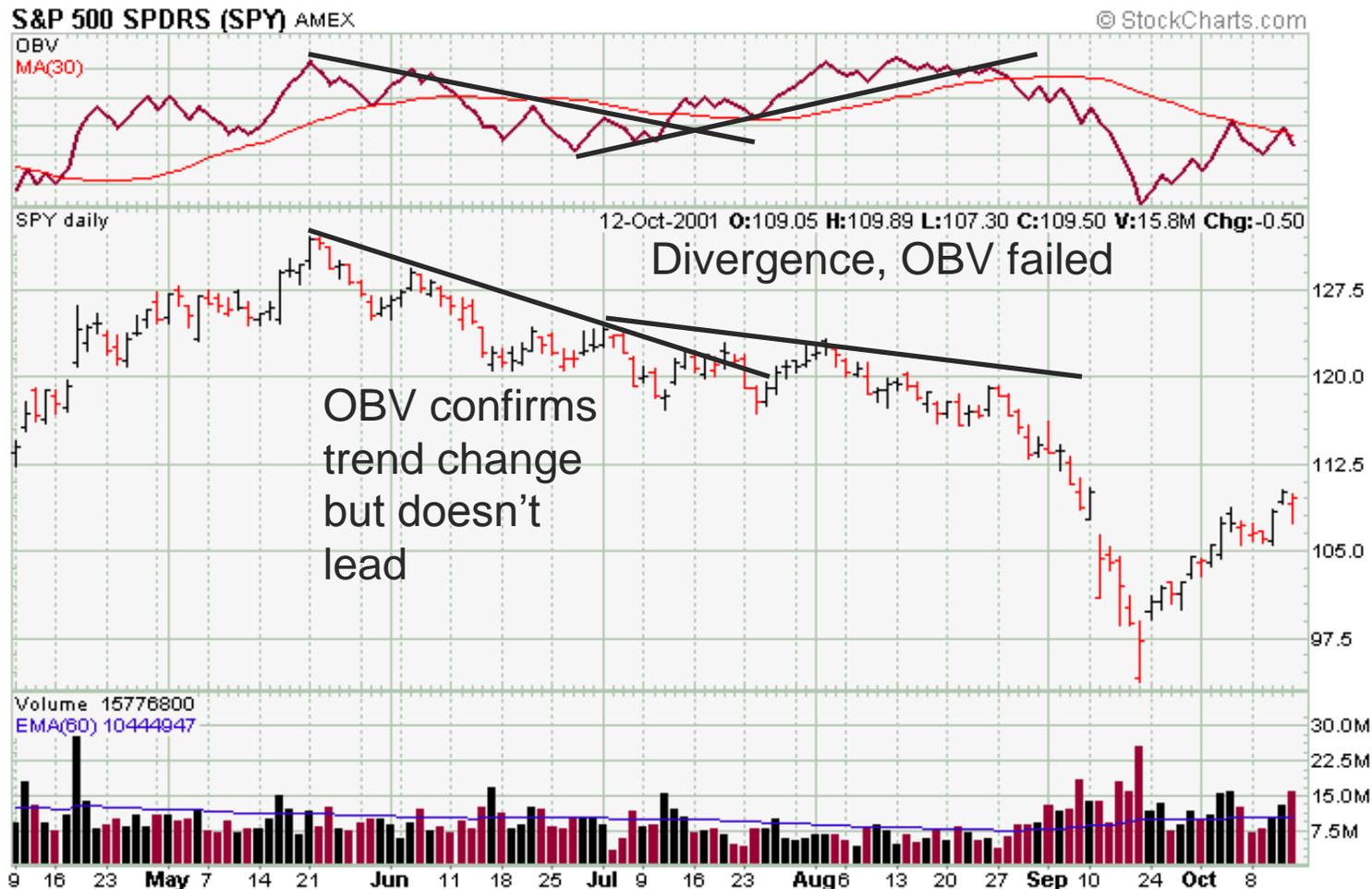
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# [ On Balance Volume ]

- On Balance Volume was developed by Joseph Granville, one of the most famous technicians of the 1960's and 1970's.
- OBV is calculated by adding volume on up days, and subtracting volume on down days. A running total is kept.
- Granville believed that “volume leads price.”
- To use OBV, you generally look for OBV to show a change in trend (a divergence from the price trend).
- If the stock is in an uptrend, but OBV turns down, that is a signal that the price trend may soon reverse.

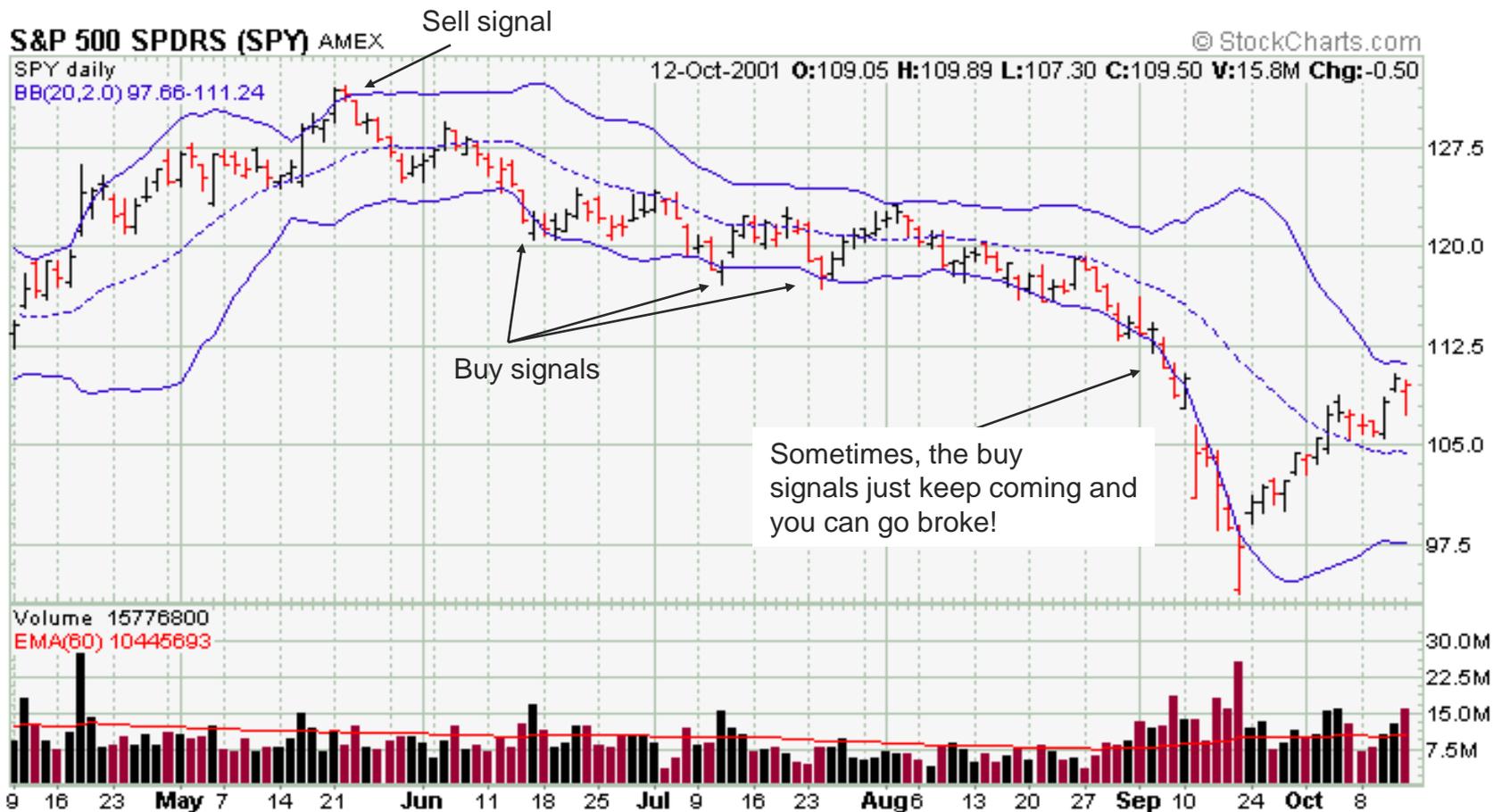
# OBV Example Chart



# Bollinger Bands

- Bollinger bands were created by John Bollinger (former FNN technical analyst, and regular guest on CNBC).
- Bollinger Bands are based on a moving average of the closing price.
- They are two standard deviations above and below the moving average.
- A buy signal is given when the stock price closes below the lower band, and a sell signal is given when the stock price closes above the upper band.
- When the bands contract, that is a signal that a big move is coming, but it is impossible to say if it will be up or down.
- In my experience, the buy signals are far more reliable than the sell signals.

# Bollinger Bands Example Chart



# [ Dow Theory ]

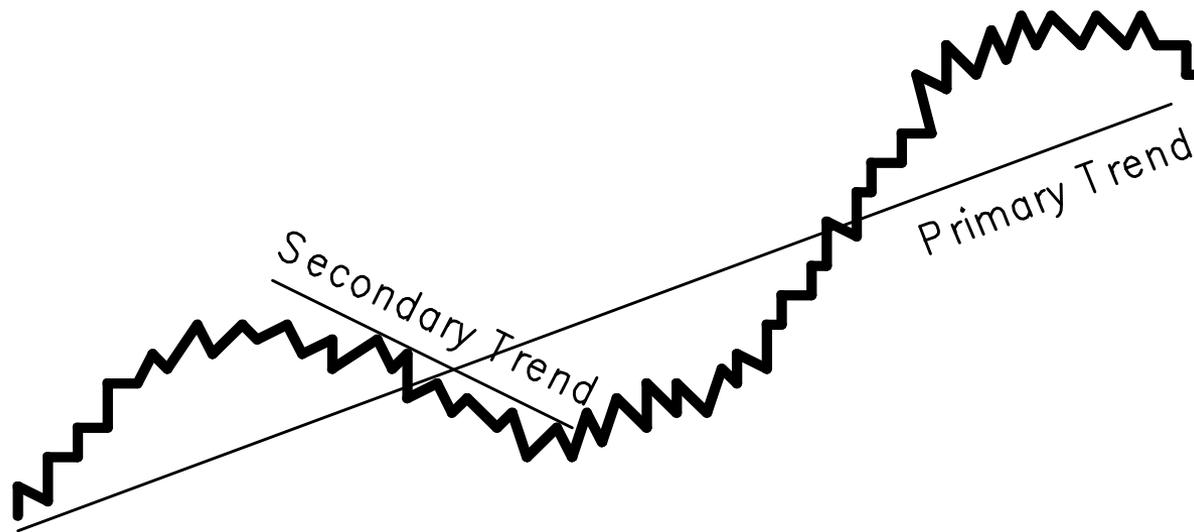
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- This theory was first stated by Charles Dow in a series of columns in the WSJ between 1900 and 1902.
- Dow (and later Hamilton and Rhea) believed that market trends forecast trends in the economy.
- A change in the trend of the DJIA must be confirmed by a trend change in the DJTA in order to generate a valid signal.

# Dow Theory Trends (1)

- Primary Trend
  - Called “the tide” by Dow, this is the trend that defines the long-term direction (up to several years). Others have called this a “secular” bull or bear market.
- Secondary Trend
  - Called “the waves” by Dow, this is shorter-term departures from the primary trend (weeks to months)
- Day to day fluctuations
  - Not significant in Dow Theory

# Dow Theory Trends (2)



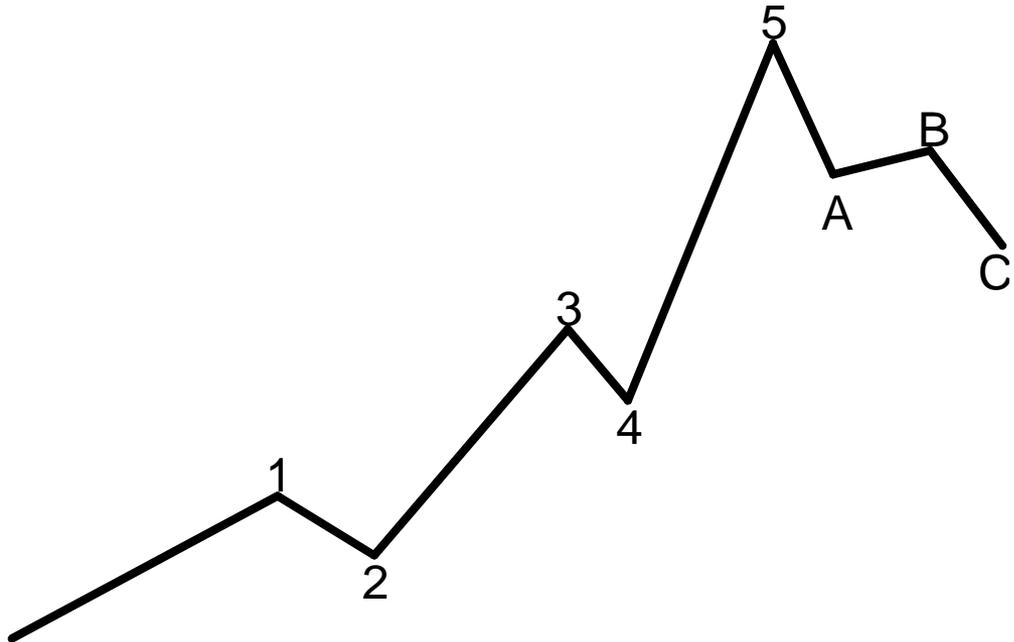
# Does Dow Theory Work?

- According to Martin Pring, if you had invested \$44 in 1897 and followed all buy and sell signals, by 1981 you would have accumulated about \$18,000.
- If you had simply invested \$44 and held that portfolio, by 1981 you would have accumulated about \$960.

# Elliot Wave Principle (1)

- R.N. Elliot formulated this idea in a series of articles in Financial World in 1939.
- Elliot believed that the market has a rhythmic regularity that can be used to predict future prices.
- The Elliot Wave Principle is based on a repeating 8-wave cycle, and each cycle is made up of similar shorter-term cycles (“Big fleas have little fleas upon their backs to bite 'em - little fleas have smaller fleas and so on ad infinitum”).
- Elliot Wave adherents also make extensive use of the Fibonacci series.

# [ The Elliot Wave Principle (2) ]



# Fibonacci Numbers

- Fibonacci numbers are a series where each succeeding number is the sum of the two preceding numbers.
- The first two Fibonacci numbers are defined to be 1, and then the series continues as follows: 1, 1, 2, 3, 5, 8, 13, 21...
- As the numbers get larger, the ratio of adjacent numbers approaches the Golden Mean: 1.618:1.
- This ratio is found extensively in nature, and has been used in architecture since the ancient Greeks (who believed that a rectangle whose sides had the ratio of 1.618:1 was the most aesthetically pleasing).
- Technical analysts use this ratio and its inverse, 0.618, extensively to provide projections of price moves.

# Does Elliot Wave Work?

- Who knows? One of the biggest problems with Elliot Wave is that no two practitioners seem to agree on the wave count, and therefore on the prediction of what's to come.
- Robert Prechter (the most famous EW practitioner) made several astoundingly correct predictions in the 1980's, but hasn't been so prescient since (he no longer gets much press attention).
- For example, in 1985 he predicted that the market would peak in 1987 (correct), but he thought it would peak at 3686 ( $\pm 100$  points).
- The DJIA actually peaked on 25 August 1987 at 2722.42, more than 960 points lower.

# Too Many Others To List

- As noted, there are literally hundreds of indicators and thousands of trading systems.
- A whole semester could easily be spent on just a handful of these.
- To close, just note that there is nothing so crazy that somebody doesn't use it to trade.
- For example, many people use astrology, geometry (Gann angles), neural networks, chaos theory, etc.
- There's no doubt that each of these (and others) would have made you lots of money at one time or another. The real question is can they do it consistently?
- As the carneys used to say, "You pays your money, and you takes your chances."