Technical Analysis Workshop Series

Session One
Trend Indicators
This research material has been prepared by NUS Invest.

NUS Invest specifically prohibits the redistribution of this material in whole or in part without the written permission of NUS Invest.

The research officer(s) primarily responsible for the content of this research material, in whole or in part, certifies that their views are accurately expressed and they will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this research material.
Nothing in this research material constitutes a representation that any investment strategy or recommendation contained herein is suitable or appropriate to a recipient’s individual circumstances or otherwise constitutes a personal recommendation. It is published solely for information purposes, it does not constitute an advertisement and is not to be construed as a solicitation or an offer to buy or sell any securities or related financial instruments.

No representation or warranty, either expressed or implied, is provided in relation to the accuracy, completeness or reliability of the information contained herein. The research material should not be regarded by recipients as a substitute for the exercise of their own judgement. Any opinions expressed in this research material are subject to change without notice.
Agenda

• Introduction to Trend Indicators
• Recap of Moving Averages
• Bollinger Bands
• Using Bollinger Bands as Targets
• Parabolic SAR
• Q&A
Introduction to Trend Indicators
What are trend indicators?

Trend indicators attempt to give an objective direction of trend.

Bar chart signals often conflict and it is difficult to separate the trend from the surrounding 'noise'.

Price data is smoothed and the trend is represented by a single line, as in the case of a moving average.

Because of the smoothing process, the indicators tend to lag price changes and are often called trend following indicators.
• Most trend indicators lose money during a ranging market as fluctuations in a narrow price band tend to whipsaw traders in and out of their positions.

• It is important to identify whether the market is trending or ranging and to employ indicators suited to the purpose: trend indicators for trending markets and the faster momentum indicators for ranging markets.
Examples of Trend Indicators

- Examples of trend-following indicators:
  - Moving Average (exponential, simple, weighted, variable)
  - Moving Average Envelope
  - Parabolic SAR
  - Bollinger Bands
  - Directional Movement
  - ADX
  - Aroon
  - MACD / MACD Histogram
Recap of Moving Averages
Moving Average

A moving average is the average price of securities at a given time.

Simple Moving Average (SMA) = \( \frac{\text{Sum( Price )}}{N} \)

* N = Time Period
Types of Moving Averages

- Simple Moving Averages
- Weighted Moving Averages
- Exponential Moving Averages
Moving Average Envelopes

• Envelopes are placed at fixed percentages above and below the moving average.
• Tells us when prices have strayed too far from the moving average line.
  – Market overextended in either direction.
• MA is the center of the trend and the envelope consists of points of maximum and minimum divergence from it.
Moving Average Envelopes

• Short term analysis
  – 3% envelope around a simple 21 day SMA

• Long term analysis
  – 5% envelope around a 10 week SMA
  – 10% envelope around a 20 week SMA
Examples

Figure 9.8a  3% envelopes placed around a 21 day moving average of the Dow. Moves outside the envelopes suggest an overextended stock market.
Examples

**Figure 9.8b** For longer range analysis, 5% envelopes can be placed around a 10 week average. Moves outside the envelopes helped identify market extremes.
Bollinger Bands
Bollinger Bands

• Technique developed by John Bollinger in the 80’s and a term trademarked by him in 2011

• Two trading Bands placed around a moving average similar to MA envelopes

• 2 standard deviations above and below the moving average
Bollinger Bands

- When prices touch the upper band
  - Overextended on the upside
    (Overbought)
- When prices touch the lower band
  - Overextended on the downside
    (Oversold)
Bollinger Bands

Figure 9.9a  Bollinger bands plotted around a 20 day moving average. During the sideways period from August to January, prices kept touching the outer bands. Once the uptrend resumed, prices traded between the upper band and 20 day average.
Bollinger Bands

Figure 9.9b  Bollinger bands work on weekly charts as well, by using a 20 week average as the middle line. Each touch of the lower band (see circles) signaled an important market bottom and a buying opportunity.
Use of Bollinger Bands as Targets
Use of Bollinger Bands as Targets

- Simplest way to use bollinger bands
- Use of upper and lower bands as price targets
Use of Bollinger Bands as Targets

- Situation 1
- Price bounces off lower band and crosses the moving average line
- Upper band becomes the upper price target
Use of Bollinger Bands as Targets

- Situation 2
- Price bounces off upper band and crosses the moving average line
- Lower band becomes the lower price target

Daily Bar Chart

20 Day Average

Bollinger Band
Use of Bollinger Bands as Targets

• Can also be used to predict reversals
• In a strong uptrend, prices will fluctuate between the moving average line and the upper band
• If it falls below the moving average line, this warns of a reversal to the downside
Measure of Volatility

- Bands width is a measure of volatility
- Unlike envelopes whose width stay the same, bollinger bands expand and contract based on last 20 days volatility
- Rising volatility, bands expand
- Falling volatility, bands contract
Measure of Volatility

• When bands far apart, current trend is ending
• When bands are very narrow, new trend is about to be initiated.
Bollinger Squeeze

• Periods of low volatility are often followed by periods of high volatility
• Therefore, a volatility contraction or narrowing of the bands can foreshadow a significant advance or decline.
• Once the squeeze play is on, a subsequent band break signals the start of a new move.
Bollinger Squeeze

• A new advance starts with a squeeze and subsequent break above the upper band.

• A new decline starts with a squeeze and subsequent break below the lower band.
Bollinger Squeeze

• There is also an indicator for measuring the distance between the Bollinger Bands, the BandWidth indicator.

• It is simply the value of the upper band less the value of the lower band.
Bollinger Squeeze

- Stocks with higher prices tend to have higher BandWidth readings than stocks with lower prices.
- If price equals 100 and BandWidth equals 5, then BandWidth would be 5% of the price.
- If price equals 20 and BandWidth equals 1, then BandWidth would also be 5% of price. Keep this in mind when using the indicator.
Strategy

- Narrowing Bollinger Bands and low BandWidth levels. Ideally near the low end of its six month range.
- Wait for a band break to signal the start of a new move.
- An upside bank break is bullish, while a downside bank break is bearish.
Strategy

• Note that narrowing bands do not provide any directional clues.
• They simply infer that volatility is contracting and chartists should be prepared for a volatility expansion, which means a directional move.
Strategy

1. Bands narrow
2. BandWidth declines to low end of range
3. Price plunges below lower band
Parabolic Stop and Reverse (SAR)
Parabolic SAR

- Developed by J. Welles Wilder Jr.
- Trend following system
- Stop and Reverse
  - Position is reversed when the protective stop is hit
  - Helps to identify when a trend is ending
- Trailing stops that are shaped like a parabola
Parabolic SAR

- Appears as dots on the charts
- As prices trend higher, the rising dots below the price action starts out slower and then accelerates with trend
- In the downtrend, the reverse happens
  - Dots above the price action
Parabolic SAR

Acceleration Factor

- Wilder built in an acceleration factor into the system
  - At first, movement of the stop is relatively slow to allow the trend time to become established
  - As the acceleration factor increases, the SAR begins to move faster, catching up with the price action
  - If trend fails to materialize, result is a stop and a reverse signal
Parabolic SAR

- As seen in the diagram, dots shift from being below the candles in an uptrend to being above the candles in a downtrend.
Parabolic SAR

- Simply, when the dots are below the candles, it is a buy signal.
- When it is above the candles, it is a sell signal.
Parabolic SAR

• Can also be used to know when to exit trades
Parabolic SAR

- Works extremely well during trending markets
- However, during non-trending periods and ranges, the system will whipsaw and not be very useful
Parabolic SAR

A sell signal is triggered when the price moves below the lower dot (shown by the black circle).

During periods of sideways price movement, it is not uncommon to see the SAR change direction several times.

The Parabolic SAR follows the trend as it develops. The reversal is triggered when the price breaks below the nearest dot.
Parabolic SAR

Figure 15.1  The Parabolic SARs look like dots on the chart. A buy signal was given when the upper SAR was hit (first arrow). Notice how the SARs accelerated upward during the rally and caught most of the uptrend. A small whipsaw occurred to the upper right, which was quickly corrected. This system works when a trend is present.
Figure 15.2 A longer range version of the previous chart shows the good and bad aspects of Parabolics and any trend-following system. They work during trending periods (to the left and right of the chart). But are useless during the type of trading range that occurred from August to January.
Figure 15.3  Parabolics can be used on a monthly chart to track the primary trend. A sell signal in early 1994 was followed by a buy in late summer. Except for one whipsaw during 1996, this system has stayed positive for almost four years.
Figure 15.4  Parabolics applied to weekly chart of Dell Computer. After staying positive through most of 1997, a sell signal was given during October. That sell signal was reversed and a buy signal given as 1997 ended.
One way to deal with this problem is to use some type of filter or device to determine if the market is in trending mode.

Wilder developed the directional movement index (DMI) and the average directional movement index (ADX).

ADX is essentially a smoothed difference between the +DI and –DI lines.
DMI and ADX

• Rates the directional movement of the market on a scale of 0-100

• A rising ADX line indicates that the market is trending
  • Suitable for trend following system

• A falling ADX line indicates that the market is non-trending
  • Not suitable for a trend following system
DMI and ADX

Figure 15.5: The ADX line measures the degree of directional movement. A downturn from above 40 (left arrow) signaled the onset of a trading range. The upturn from below 20 (right arrow) signaled the resumption of a trending phase.
DMI and ADX

• Trader could simply trade on those markets with the highest trend ratings

• Non trending systems (e.g. oscillators) can be utilized on markets with low directional movement
DMI and ADX

- Directional indicators can be used on their own or as a filter
- 2 lines are generated for DMI study
  - +DI
    - Measures positive (upward) movement
  - -DI
    - Measures negative (downward) movement
DMI and ADX

• A buy signal is given when the +DI line crosses over the –DI line.
DMI and ADX

• A sell signal is given when the +DI line crosses **below** the –DI line
Using both parabolic SAR and DMI together

- Parabolic SAR is a more sensitive system
  - More frequent, earlier signals given
- DMI used as a filter
  - Follow only those signals in the same direction as the DMI lines
Using both parabolic SAR and ADX together

- Best to use trending system when ADX is rising
- Caveat
  - When ADX starts to drop from above the 40 level, early sign that the trend is weakening
- Rise back above the 20 level is often the start of a new trend
Using both parabolic SAR and ADX together

Figure 15.7  The 14 week ADX line peaked in early 1996 from well over 40, and initiated an 18 month trading range in utilities. The ADX upturn during the summer of 1997 from below 20 signaled that utilities were starting to trend.
Using both parabolic SAR and ADX together
Q & A
THANK YOU!