Technical Analysis Workshop

Session Eight

Oscillators

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Agenda

- Introduction + Recap

- Four Simple Oscillators

  • CCI
  • MACD
  • RSI
  • DMI
PROFILE

• Year 4 BEng (Electrical)
• Started my first trading account Jan 2013
• Focused on TA
(Recap)

FA vs TA
(From Session 1)

FA vs TA

<table>
<thead>
<tr>
<th>FUNDAMENTAL ANALYSIS</th>
<th>TECHNICAL ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Focuses on the economic forces of Demand &amp; Supply that causes prices to move</td>
<td></td>
</tr>
<tr>
<td>• Finding the intrinsic value of the market/asset</td>
<td></td>
</tr>
<tr>
<td>• Characteristics of a company is employed in the analysis</td>
<td></td>
</tr>
<tr>
<td>• Effects of economic factors on a stock such as earning reports, cash flow, etc are concerned</td>
<td></td>
</tr>
<tr>
<td>• Analysis using past data of Demand &amp; Supply</td>
<td></td>
</tr>
<tr>
<td>• Study of historical graphs is stressed</td>
<td></td>
</tr>
<tr>
<td>• Identify a trend at a relatively early stage &amp; ride on that trend until the weight of the evidence shows or proves that the trend has reversed</td>
<td></td>
</tr>
<tr>
<td>• Deals in probabilities, never certainties</td>
<td></td>
</tr>
</tbody>
</table>
How I see it

### Fundamental Analysis

**Abercrombie & Fitch Co.**

**Consolidated Statements of Operations and Comprehensive Income**

(Thousands, except share and per share amounts)

<table>
<thead>
<tr>
<th>Item</th>
<th>2012</th>
<th>(Restated see Note 4)</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net Sales</strong></td>
<td>$4,510,805</td>
<td>$4,158,058</td>
<td>$3,468,777</td>
<td></td>
</tr>
<tr>
<td><strong>Cost of Goods Sold</strong></td>
<td>1,694,098</td>
<td>1,607,834</td>
<td>1,251,348</td>
<td></td>
</tr>
<tr>
<td><strong>Gross Profit</strong></td>
<td>2,816,707</td>
<td>2,550,224</td>
<td>2,217,432</td>
<td></td>
</tr>
<tr>
<td><strong>Selling and Distribution Expense</strong></td>
<td>1,087,926</td>
<td>1,088,348</td>
<td>1,089,501</td>
<td></td>
</tr>
<tr>
<td><strong>Marketing, General and Administrative Expense</strong></td>
<td>473,883</td>
<td>437,120</td>
<td>400,804</td>
<td></td>
</tr>
<tr>
<td><strong>Other Operating Expense (Income), Net</strong></td>
<td>(19,313)</td>
<td>3,472</td>
<td>(10,056)</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Income</strong></td>
<td>274,223</td>
<td>221,384</td>
<td>237,180</td>
<td></td>
</tr>
<tr>
<td><strong>Interest Expense, Net</strong></td>
<td>7,388</td>
<td>3,577</td>
<td>3,362</td>
<td></td>
</tr>
<tr>
<td><strong>Income from Continuing Operations Before Taxes</strong></td>
<td>366,945</td>
<td>217,807</td>
<td>233,818</td>
<td></td>
</tr>
<tr>
<td><strong>Tax Expense from Continuing Operations</strong></td>
<td>129,934</td>
<td>71,669</td>
<td>78,109</td>
<td></td>
</tr>
<tr>
<td><strong>Net Income from Continuing Operations</strong></td>
<td>237,011</td>
<td>143,138</td>
<td>155,709</td>
<td></td>
</tr>
<tr>
<td><strong>Income from Discontinued Operations, Net of Tax</strong></td>
<td>$ —</td>
<td>$ 706</td>
<td>$ —</td>
<td></td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td>237,011</td>
<td>143,138</td>
<td>155,709</td>
<td></td>
</tr>
<tr>
<td><strong>Net Income Per Share from Continuing Operations:</strong></td>
<td><strong>Basic</strong></td>
<td>2.89</td>
<td>1.65</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td><strong>Diluted</strong></td>
<td>2.83</td>
<td>1.60</td>
<td>1.73</td>
</tr>
<tr>
<td><strong>Net Income Per Share from Discontinued Operations:</strong></td>
<td><strong>Basic</strong></td>
<td>$ —</td>
<td>0.01</td>
<td>$ —</td>
</tr>
<tr>
<td></td>
<td><strong>Diluted</strong></td>
<td>$ —</td>
<td>0.01</td>
<td>$ —</td>
</tr>
<tr>
<td><strong>Net Income Per Share:</strong></td>
<td><strong>Basic</strong></td>
<td>2.80</td>
<td>1.66</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td><strong>Diluted</strong></td>
<td>2.85</td>
<td>1.61</td>
<td>1.73</td>
</tr>
<tr>
<td><strong>Weighted-Average Shares Outstanding:</strong></td>
<td><strong>Basic</strong></td>
<td>81,940</td>
<td>86,848</td>
<td>88,064</td>
</tr>
<tr>
<td></td>
<td><strong>Diluted</strong></td>
<td>81,175</td>
<td>89,547</td>
<td>89,831</td>
</tr>
<tr>
<td><strong>Dividends Declared Per Share</strong></td>
<td>$ 0.70</td>
<td>$ 0.70</td>
<td>$ 0.70</td>
<td></td>
</tr>
<tr>
<td><strong>Other Comprehensive Income (Loss)</strong></td>
<td>$ —</td>
<td>$ —</td>
<td>$ —</td>
<td></td>
</tr>
</tbody>
</table>
What is an Oscillator?
Indicators

• Calculations based on the price and volume
• Money flow, trends, volatility and momentum
• Used as a **secondary measure** to actual price movements and add additional information to the analysis
• Used in two main ways
  1. To confirm price movement and the quality of chart patterns
  2. Form buy and sell signals
Oscillators

• Indicators that fall within a bounded range (e.g. 0 to 100)
• Crossovers and divergence
• Leading vs Lagging
• Discover short-term overbought & oversold conditions
• Common oscillators include:
  • MACD
  • Stochastic
  • RSI
Commodity Channel Index (CCI)

- First Developed by Donald Lambert
- Designed to identify cyclical turns in commodities
- Oscillator used in TA to determine overbought & oversold conditions
- Quantifies relationship between the asset's price, a moving average (MA) of the asset's price, and normal deviations (D) from that average

\[ CCI = \frac{\text{Price} - \text{MA}}{0.015 \times D} \]
Commodity Channel Index (CCI)

\[ CCI = \frac{\text{Price} - \text{SMA}}{0.015 \times D} \]

\[ \text{Price} = \frac{H + L + C}{3} \]

SMA = Simple Moving Average of Price

D = Mean Absolute Deviation of MA

0.015?

Scaling factor so that 70-80% of values fall within -100 to +100
Commodity Channel Index (CCI)

\[ CCI = \frac{\text{Price} - \text{SMA}}{0.015 \times D} \]

- Depends on the number of periods used
- Shorter CCI -> more volatile
- Longer CCI -> more values within the range of -100 to +100
Commodity Channel Index (CCI)
Commodity Channel Index (CCI)

Using the CCI

- Moves above +100 & slopes upwards -> Strong uptrend
- Moves above +100 & slopes downwards -> Sell signal
- Moves below -100 & slopes downwards -> Strong downtrend
- Moves below -100 & slopes upwards -> Buy signal
MACD
Moving Average Convergence Divergence (MACD)

• Created by Gerald Appel in the late 1970s
• Spot changes in the strength, direction, momentum and duration of a trend
• Collection of three signals
  1. MACD Line
  2. Signal Line (Average Line)
  3. Difference (Divergence)
MACD

- MACD Line (Blue Line)
  - Difference between a “fast” (shorter period) exponential moving average (EMA) and a “slow” (long) EMA
  - EMA: Moving average with more weight given to the latest data
  - Default Value: 26 Period EMA and 12 Period EMA

- Signal Line (Red Line)
  - EMA of MACD Line – An Average of the MACD Values
  - Default Value: 9 Period EMA of MACD Line

- Difference (Histogram)
  - Difference between MACD Line and Signal Line
MACD

Theory

• MACD Line tracks changes in trend of stock, since the fast EMA (shorter duration) responds quicker than the slow EMA (longer duration)

• By comparing against its average value, the Signal Line, shifts in the stock’s trend can be easily identified

• Histogram is an easy visual reference, where the bars will be zero when the two lines cross (and where we would want to enter a trade)
MACD

Using the MACD

Crossovers

• MACD falls below the Signal -> bearish
• MACD crosses above the Signal -> bullish

Substantial Increase

• MACD rises dramatically -> asset is overvalued as the increase of short-term MA diverges from long-term MA

Zero Line

• MACD above zero line -> bullish
• MACD below zero line -> bearish
Other ways to use these oscillators
Oscillators (Slide 12)

- Indicators that fall within a bounded range (e.g. 0 to 100)
- Crossovers and divergence
- Leading vs Lagging
- Discover short-term overbought & oversold conditions
- Common oscillators include:
  - MACD
  - Stochastic
  - RSI
(Recap)
Reversal Patterns
Overview: Reversal Patterns (Session 4)
Trading Divergences

- Black Line = closing prices
- Breakout
- Lower low

MACD (12,26,9)
- Signal line cross
- Higher low

Bullish Divergence
Trading Divergences
Trading Divergences (Reversals)

Regular Bullish

• Lower Low in Price
• Higher Low in Indicator

Regular Bearish

• Higher High in Price
• Lower High in Indicator
Trading Divergences (Continuation)

Hidden Bullish

• Higher Low in Price
• Lower Low in Indicator

Hidden Bearish

• Lower High in Price
• Higher High in Indicator
PROFILE

• Year 1 BBA
• Started FX trading in 2011
• Focused on TA
Relative Strength Index (RSI)

What is it?

• Created by J. Welles Wilder in 1978

• Momentum Oscillator

→ Measures 2 aspects of directional price movements

1. Velocity (How fast it happened)

2. Magnitude (How much change)

• Momentum is the rate of the rise or fall in price.

• RSI computes momentum as ratio of higher closes to lower closes.
# Relative Strength Index (RSI)

## The Formula

<table>
<thead>
<tr>
<th>An UP period</th>
<th>A DOWN period</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{Close Now} ) is Higher than Previous</td>
<td>( \text{Close Now} ) is Lower than Previous</td>
</tr>
</tbody>
</table>

### An UP period

\[
U = \text{close}_{\text{now}} - \text{close}_{\text{previous}}
\]

### A DOWN period

\[
D = \text{close}_{\text{previous}} - \text{close}_{\text{now}}
\]

### The average of U and D are calculated using an \( n \)-period EMA (Relative Strength Factor)

\[
RS = \frac{\text{EMA}(U, n)}{\text{EMA}(D, n)}
\]

### Factor is converted to an index

\[
\text{RSI} = 100 - \frac{100}{1 + RS}
\]
Relative Strength Index (RSI)

How is it used?

• Measured on a scale of 0 to 100 (%)

• Typically used on a 14 Day Timeframe (14d)
  *(Shorter or longer timeframes are used for different outlooks)*

• Typical markers :
  → 70 % = Overbought
  → 30 % = Oversold
  *(Other markers include 80/20 or 90/10 but these are rare)*
Relative Strength Index (RSI)

How is it used?

• Can be used to track the following:
  1. Reversals
  2. Uptrends & Downtrends
  3. Divergence

• Principles of RSI as posited by Wilder
  1. Rapid price increases usually become considered overbought
  2. Rapid price decreases usually become considered oversold
  3. Reaction or reversal after either of the two is imminent
Relative Strength Index (RSI)

Reversals

→ Overbought – RSI at 70% or higher

Once considered overbought, there is a chance for a **negative** reversal. (Bearish Reversal)

In other words, the price is considered too high and there’s a chance of it coming down.

Traders look to take up a Short Position (SELL)
Relative Strength Index (RSI)

Reversals

→ Oversold – RSI at 30% or lower

Once considered oversold, there is a chance for a positive reversal. (Bullish Reversal)

In other words, the price is considered too low and there’s a chance of it going up.

Traders look to take up a Long Position (BUY)
RSI - Reversals

Sell signal as RSI moves below 70 line

Buy signal as RSI moves above 30 line
Overview: Reversal Patterns (Session 4)
Relative Strength Index (RSI)
Failure Swings *(Another form of Reversal)*

→ Failure Swing : Top

- Similar to a **Double-Top**, but for RSI
Relative Strength Index (RSI)

Failure Swings (Another form of Reversal)

→ Failure Swing : Bottom

- Similar to a Double-Bottom, but for RSI
Relative Strength Index (RSI)  
Uptrends & Downtrends

→ RSI can detect / confirm prevailing trends by its centerline crossover

→ Centerline = 50% (50% is considered Neutral)

→ Looking at the Centerline **Crossover** helps determine Up/Down Trend

→ RSI *above* centerline considered Uptrend

→ RSI *below* centerline considered Downtrend
RSI - Trends
Relative Strength Index (RSI)

Divergences

→ When price action ≠ Indicator movement

→ Occurs when indicator moves against the price action at the same period.

→ This means price is moving in upward direction, but indicator is moving in the downward direction at the same time.

→ Divergences can help refine BUY / SELL signals for Reversals

→ 2 Types
  - Bullish Divergence
  - Bearish Divergence
RSI - Bullish Divergence
RSI - Bearish Divergence

Higher High

Lower High
DMI
Directional Movement Index (DMI)

What is it?

• Created by J. Welles Wilder in 1978

• Used for identifying when a definable trend is present in an instrument.

• That is, the DMI tells whether an instrument is trending or not.

• A variant of the DMI called the Average DMI or “ADX” is also commonly used.
Directional Movement Index (DMI)

How is it used?

- DMI quantifies the **Strength** of the trend.
- One objective of traders is to enter trades that go **WITH** the trend. *(E.G. Buy when Uptrend strong)*
- Thus, entering a strong trend is good, and entering a weak one is dangerous.
- Simply put, it helps determine if a trader should buy or sell based on how strong his chances are of catching a rise or fall in price.
Directional Movement Index (DMI)

How is it used?

• Measured on a scale of 0 to 100 (%)

• Typically used on a 14 Day Timeframe (14d)
  *(Shorter or longer timeframes are used for different outlooks)*

• Typical markers :
  “+ DMI” is the Positive DMI, measures how strongly price moves upwards

  “- DMI” is the Negative DMI, measures how strongly price moves downwards
**Directional Movement Index (DMI)**

- Positive DMI is Directly related to Price Action
- Negative DMI is Inversely related to Price Action

<table>
<thead>
<tr>
<th></th>
<th>DMI</th>
<th>Price Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Positive DMI</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>- Negative DMI</td>
<td>↑</td>
<td>↓</td>
</tr>
<tr>
<td>+ Positive DMI</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>- Negative DMI</td>
<td>↓</td>
<td>↑</td>
</tr>
</tbody>
</table>

+ *DMI and Price are friends*
- *DMI is anti-social*
Directional Movement Index (DMI)
Directional Movement Index (DMI)

How is it used?

→ Firstly, refer to which DMI line is on top.

→ DMI line on top is referred to as the “Dominant DMI”

→ The Dominant DMI is the stronger line and more likely to predict the direction of the price.

→ “+ DMI” is on top that means more likely its rising

→ “- DMI” is on top that means more likely its falling.

→ Line crossovers indicate a change in dominance
  
  (Crossovers only indicate a potential change in direction)
Directional Movement Index (DMI)
**Directional Movement Index (DMI)**

**How is it used?**

→ DMI values range between 0 to 100

→ Reading Directional Signals:
  - DMI values over (> ) 25 mean price is directionally strong
  - DMI values under (< ) 25 mean price is directionally weak

→ DMI allows a trader to see the buying and selling pressure by determining which is the dominant force.

→ DMI is mainly used to help identify and confirm a trend before entering a trade.
THANK YOU!
QUESTIONS & ANSWERS

Oscillators:
1. CCI
2. MACD
3. RSI
4. DMI
References

Technical Analysis – Indicators and Oscillators

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CCI

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DMI

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