Intro

• Time series reversion
• Cross sectional reversion
• Because of this ease of finding mean-reverting patterns, the stock market attracts a large number of traders, often called statistical arbitrageurs
• Back testing is tricky as composition changes regularly

• In the Long Run most stocks follow geometric random walks
• However, in the Short term most stocks exhibit mean reverting properties
  • We can exploit this
Pair Trading

• Risks
  • Short squeeze- sudden jump in price for hard-to-borrow stock
  • Alternative uptick rule since 2010 - 10%
  • Same industry does not mean same fortunes
  • Seldom cointegrate out of sample BBRY vs AAPL
  • LLN- small profits of good pairs overwhelmed by losses on bad pairs
  • The second difficulty arises in the intraday trading of stock pairs.
  • Also, if traders refrain from taking overnight positions in stock pairs, they may be able to avoid the changes in fundamental corporate valuations that plague longer-term positions mentioned above.
  • AAPL NBBO at only 100 shares- therefore costs higher or small trades

• Decimalisation
• Other countries less efficient therefore may be profitable there
ETFs

• Less likely to fall out of cointegration
• Gold
• ETFs NBBO much larger but still have alt uptick rule
Possible Strategy

• Select all stocks near the market open whose returns from their previous day’s lows to today’s opens are lower than one standard deviation. The standard deviation is computed using the daily close-to-close returns of the last 90 days. These are the stocks that “gapped down.”

• Narrow down this list of stocks by requiring their open prices to be higher than the 20-day moving average of the closing prices.

• Buy the 10 stocks within this list that have the lowest returns from their previous day’s lows. If the list has fewer than 10 stocks, then buy the entire list.

• Liquidate all positions at the market close
Returns

**FIGURE 4.1** Cumulative Returns of Buy-on-Gap Model

**FIGURE 4.2** Cumulative Returns of Short-on-Gap Model
Conclusions

• Are you tempted to trade pairs of stocks because of the enormous number of choices? Beware of changes in companies’ fundamentals that can render out-of-sample performance quite poor despite stellar backtest results.

• Trading a portfolio of cointegrating ETFs can be better than pair-trading stocks.

• Are you pair trading ETFs that hold futures? Beware of the role of roll returns in determining total returns of futures.

• Seasonal or intraday mean reversion is hard to detect with usual stationarity or cointegration tests, but can be very profitable.

• Imposing momentum filter on mean-reversal strategies typically improves their consistency.

• Do you think that index arbitrage between stocks and futures is no longer profitable? Try selecting only a subset of the stocks in the index.

• Cross-sectional mean reversion strategies can be implemented very easily with a linear long-short strategy.

• The variable used for ranking stocks in a cross-sectional mean reversion strategy is typically relative return, but it can be other fundamental factors such as P/E ratio.