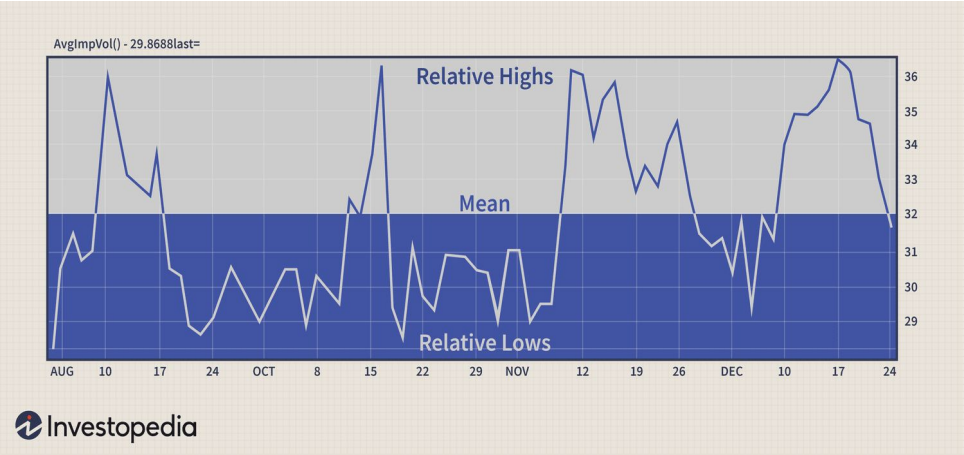
Quant Strategies

Mean Reversion

After an extreme price move, asset prices tend to return back to normal or average levels. Prices routinely oscillate around the mean or average price but tend to return to that same average price over and over.



Types:

Forex Trading: Involves looking at how far the price tends to **deviate** from the mean before reverting back to the mean

Intraday strategies: Involve buying and selling **multiple assets** throughout a single day and positions are most often not held overnight.

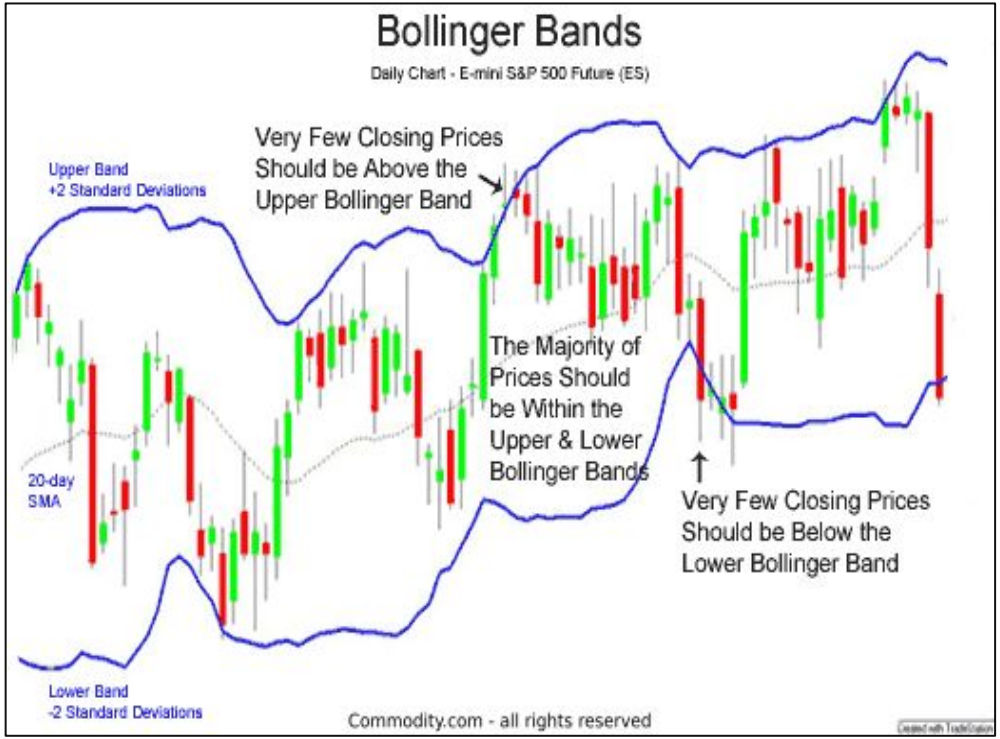
Pair Trading: Involves finding two highly **correlated** assets. The prices of these tend to move together. When the prices deviate from one another; for example, one drops when the other doesn't

Bollinger Bands

A technical analysis tool defined by a set of **trendlines**. They are plotted as two standard deviations, both positively and negatively, away from a simple moving average of a security's price and can be adjusted to user preferences.

Many traders believe the closer the prices move to the **upper** band, the more **overbought** the market, and the closer the prices move to the **lower** band, the more **oversold** the market.

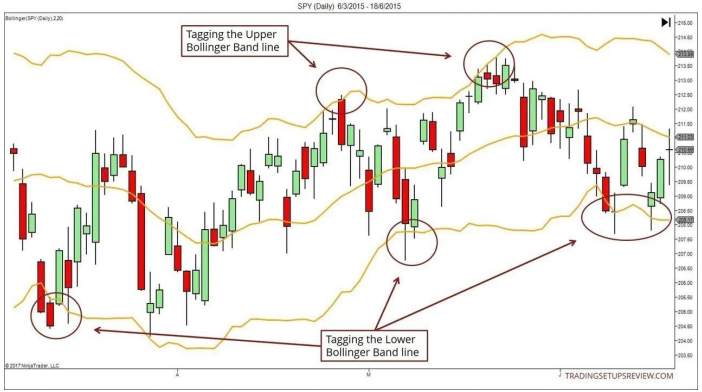
Squeeze: When the bands come close together, constricting the moving average. Signals a period of low volatility



Price Entry + Exit Points

Bollinger Bands:

- Whenever the price of the underlying asset is testing the **upper** band, the assumption of an **overbuy** prompts a potential **sell** signal (**entry** point)
- When the price of the underlying hits the **bottom** band, the asset is assumed to be **oversold**, which prompts a potential **buy** signal (**entry** point)
- **Exit** points are when the price **retracts** back to mean



Mean Reversion:

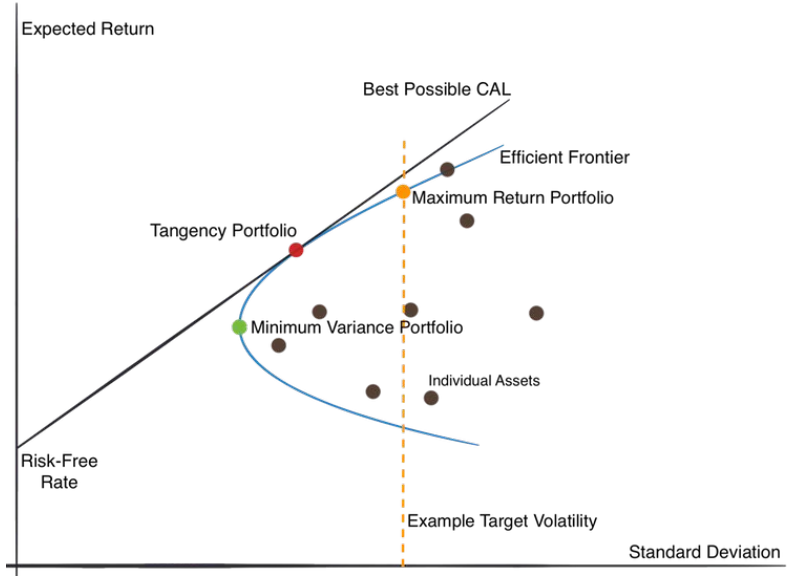
- A **large gap** between the simple moving average and asset price creates potential for an **entry** point
  - If the price is heavily **above** the mean, the asset is **shorted**
  - If price is heavily **below** the mean, the asset is **longed**
- **Exit** points are when the price **retracts** back to mean

Markowitz Portfolio

A practical method for selecting **diversified** investments in order to maximize their overall returns within an acceptable level of risk

$$RP = IRF + (RM – IRF)\sigma P/\sigma M$$

- RP = Expected Portfolio Return
- RM = Market Portfolio Return
- IRF = Risk-free Rate of Interest
- σM = Market's Standard Deviation
- σP = Standard Deviation of Portfolio



The agency portfolio is also the optimal one—with the Sharpe ratio.