Speculation Strategy

# Aims & General Strategy

## Aims

The speculation method aims to profit from short-run deviations from central trajectories. The key assumptions for the success of this method are:

* the prices are a random walk from the central trajectory, and
* the market is right about the central trajectory.

## General Strategy

The method includes three independent indicators that help profile building:

1. Long/short scale (4 items)
   1. The current price is lower than the central of the period-end valuation (deterministic),
   2. On an undiscounted basis, 80% of the time, the lowest price is not much lower than the current price, e.g. 30%.
   3. 80% of the time, upside potential, i.e. maximum price, is higher than downside risk, i.e. minimum price.
   4. 50% of the time, upside potential, i.e. maximum price, is 2 times higher than downside risk, i.e. minimum price.
   5. Minimum 3 out of 4 (a, b, c, d) for long, and short when c and d is breached.
2. Weighting
   1. With long/short points set, the model will simulate the potential valuation scenarios in the next a few years. This simulation aims to match the correlation among options in the past year.
   2. The optimizer will identify the weighting that yields the minimum shortfall from a desired return in all scenarios, with the maximum shortfall in any scenario constrained.

## Next step

* For the long/short points, the next step should focus on visualizing the potential missed opportunities. For example, for long points a, in 20% of the time when the maximum price is not profitable enough, the option may performance poorly physically.
* For the optimization, instead of a single stage shortfall minimization, a multi-stage regrets, i.e. buy at a higher price or sell at a lower price, minimization with shortfall constrained may be interesting.

# Method and inputs

The central line valuation is projected based on a dividend discount model. The EPS is simulated following predetermined distributions in three stages:

1. First stage: as in market predictions with up/down side modelled as a half normal distribution with 80%, i.e. 1.28 sigma, covered within the market prediction range.
2. Second stage: high growth period, the central rate reflecting a growth of averaging:
   1. Market prediction for the option,
   2. Market growth for the sector, and
   3. Bottom up revenue + efficiency analysis.

The distribution is assumed to be two half-normal distribution similar two the one used in the first stage but with increase standard deviation for upside, i.e. 1+ROE, and downside, 1.1 to 1.5 depending on a profitability/debt scale (i.e. ROA before interest in bad times as in the lower end of the market prediction should cover x times the interest from debt).

1. Third stage: slow growth period where growth is driven by inflation + efficiency. All growth is internally funded, so that ROE plays a role here. There are some peculiar averaging I used for the stable of the results. No randomness is introduced for this stage.

The prices are modelled as a random walk using PEG ratio:

* I first found that PEG ratio can be to some extent explained by the growth in the last couple of years:
  + where g is the perceived growth rate.
* I add 1 sigma (0.7) to reflect the randomness.

As such, the prices have two levels of uncertainty,

* uncertainty in the underlying EPS, also impacts the perceived growth rate, and
* uncertainty in the PEG ratio with added 1 sigma.

# Version Control

**Version 2024-11-03**

The inconsistency in buy/sell points in the previous version are replaced with a single scale:

1. Long point
   1. 80% of the time, the maximum price (discounted) in the next a few years yields ~ 20% annual return if sold.
   2. 50% of the time, the lowest price is not much lower than the current price, e.g. 30%.
   3. The current price is not significantly higher than the average prediction.
2. Short point
   1. 80% of the time, the lowest price will drop at least 30% below the current price.
   2. 50% of the time, the maximum price is not providing at least 2 times upside vs. downside, i.e. the low price in a.
   3. The current price is not significantly lower than the average prediction.

These reflect the psychological difference in making decisions towards different directions but could lead to inconsistencies.

**Version 2024-11-02**

The initial summary of pervious works and tests.