Composite Performance and Stock Quality Model Overview

Our system assess the quality of each stock using four core metrics:

1. **Value**: How attractively priced is the stock to its earnings and book value?
2. **Growth**: How quickly is the company expanding its revenue and earnings?
3. **Momentum**: How well the stock has been trending in recent months (outside of raw price returns)
4. **Stability**: How consistent and predictable the stock's performance is

Each of these factors are measured using financial data and normalized to a 0-100 scale. These scores are individually represented on each stock card under the appropriate threshold value. These scores are aggregated to compose an overall portfolio rating.

1. Value

a. Value is composed of 3 key metrics that are weighted and added together:

i. P/E Ratio

1. One of the most commonly used valuation measures. It tells us how much investors are willing to pay for one dollar of a company's earnings.
2. A lower P/E compared to peers suggests a stock might be undervalued→ shows whether a stock is "cheap" or "expensive" relative to its earnings

ii. P/B Ratio

1. The price-to-book ratio compares the market price of a stock to its book (net asset) value
2. This helps us understand if stock is undervalued compared to the company's actual net assets. More important for industries where asset value is key.

iii. Dividend Yield

1. Dividend yield indicates cash return an investor receives for each dollar invested
2. Higher dividend yield can signal that a stock provides steady income and may be undervalued if the yield is higher than industry averages

b. Each value is normalized and compared with the industry median

i. $S_{P/E} = 100 \times \frac{PE_{median}}{PE}$

ii. $S_{PB} = 100 \times \frac{PB_{median}}{PB}$

iii. $S_{DY} = 100 \times \frac{DY}{DY_{median}}$

c. $S_{value} = 50\% \times S_{P/E} + 30\% \times S_{P/B} + 20\% \times S_{DY}$

2. Growth

a. Growth is composed of two metrics
   i. Revenue Growth Rate
      1. How quickly the company's revenues is increasing
   ii. EPS Growth Rate
      1. How quickly earnings per share are growing

b. Each value is normalized using a target/industry growth rate (IGR)
   i. $S_{RG} = \min(100, \frac{RGR}{IRG}\ x\ 100)$
   ii. $S_{EPS} = \min(100, \frac{EPSG}{IRG}\ x\ 100)$

c. $S_{Growth} = 60\% \times S_{RG} + 40\% \times S_{EPS}$

3. Momentum

a. Momentum is composed of three metrics
   i. Price return over last 3 months
   ii. Relative performance
      1. How stock performs versus market index (e.g S&P 500)
   iii. Technical Indicator (RSI)
      1. Relative strength index (RSI) can indicate if momentum is healthy

b. Each value is normalized against industry benchmarks (IB)
   i. $S_{return} = \min(100, \frac{R3m}{IB}\ x\ 100)$
   ii. $S_{relative} = 100 \times \frac{Stock\ Return - Index\ Return}{Index\ Return}$
   iii. $S_{RSI} = 100 - |\ RSI - 50\ | \times$ Scaling Factor
      1. Note: This prioritizes a RSI near 50 to indicate steady momentum.

c. $S_{momentum} = 50\% \times S_{return} + 30\% \times S_{relative} + 20\% \times S_{RSI}$

4. Stability

a. Stability is composed of 3 key metrics
   i. Volatility (σ)
      1. Annualized standard deviation of returns
   ii. Beta:
      1. How the stock moves relative to the overall market

iii. Dividend Consistency:
    1. Measures how consistent dividends have been paid out over the last 5 years

b. Proposed evaluations
    i. $S_\sigma = 100 \times \frac{10\%}{\sigma}$
        1. Note: for volatility, lower values are better and the 10% is a target volatility
    ii. $S_B = \max(0, 100 - 100 \times (B - 1))$
        1. Beta <= 1 is ideal, for B above 1 this decreases linearly
    iii. Dividend consistency can be assigned a score between 0 and 100 based on historical reliability

c. $S_{stability} = 50\% \times S_\sigma + 30\% \times S_B + 20\% \times S_{div}$

Total Stock Quality Score (SQS)

The four scores will be aggregated to determine an overall SQS. This will take a weighted average (precise % TBD upon further evaluation)

$SQS = 25\% \times S_{value} + 25\% \times S_{growth} + 25\% \times S_{momentum} + 25\% \times S_{stability}$

Portfolio Score

Portfolio SQS = $\Sigma\ (a_i\ x\ SQS_i)$

Where a_i is the fraction of the portfolio invested in stock i.