Finding Stock Market Inefficiencies

ANALYSIS BY BRIAN BENTSON

Finding Stock Market Inefficiencies

This analysis focuses on finding which stocks offer the unique combination of low cost and low volatility growth in the stock price.

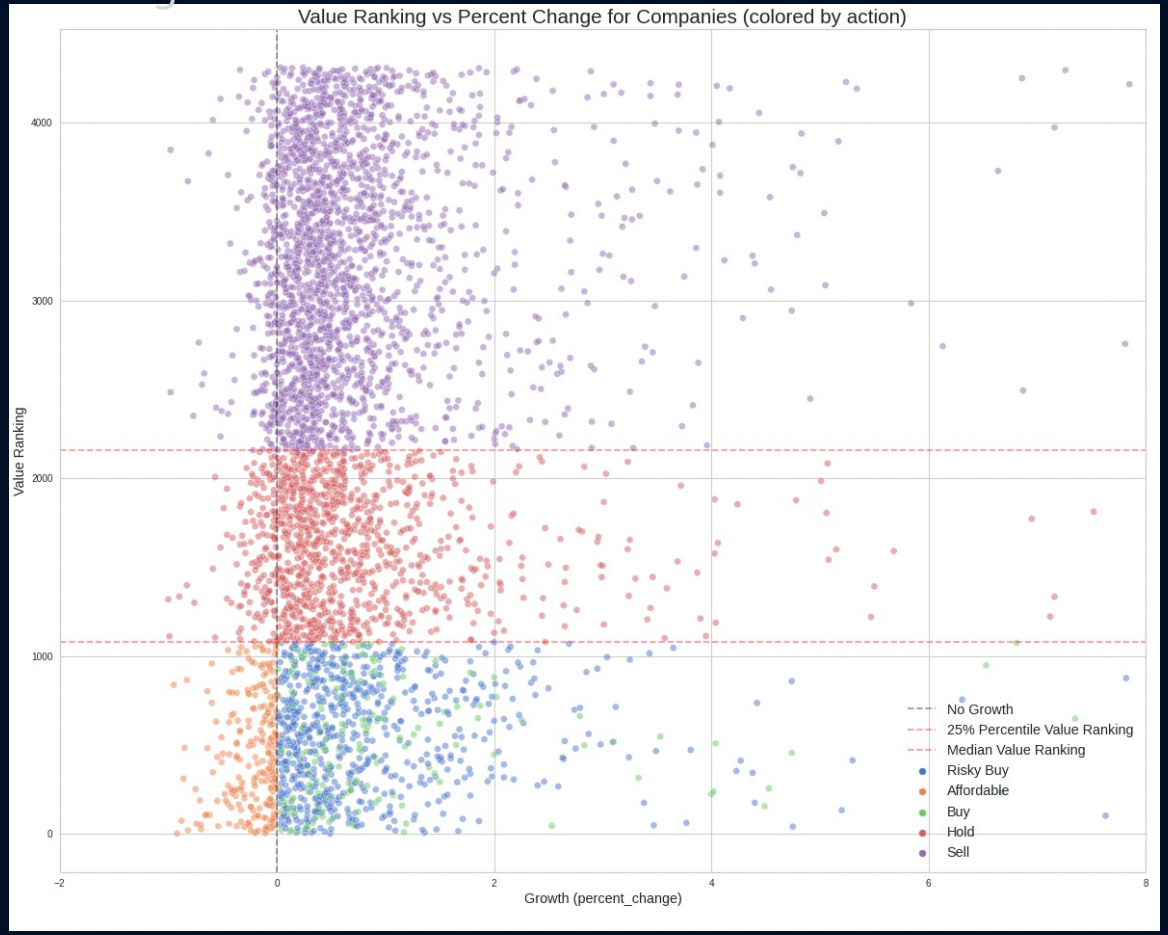
Analysis took 3 main steps…

1. Created an Action label for each stock with domain knowledge

2. Use machine learning to predict which companies to buy and identify data quality issues

3. Create an interactive Tableau Dashboard to explore investment opportunities

Labeling of Stocks based on Growth and Value



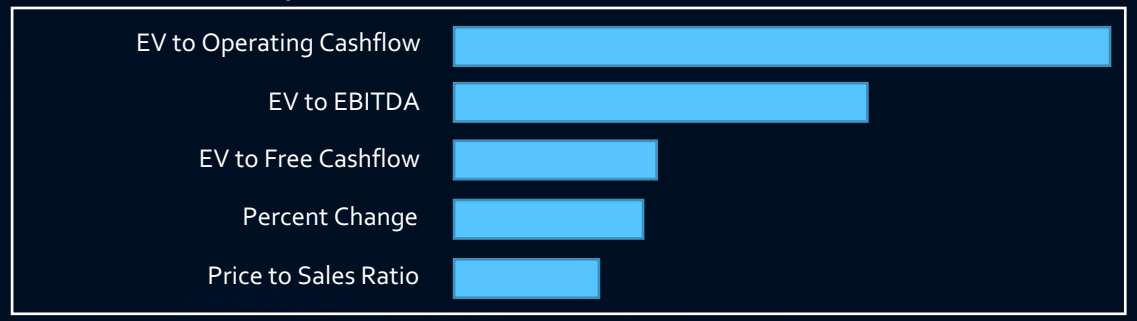
Classification Results

Classification was used to predict the domain-labeled action feature to identify inefficient stocks to Buy

- A gradient boosted tree provided the best model for achieving the best overall accuracy
- The model can correctly identify the "Buy" label 93% of the time
- Enterprise Value to Operating Cashflow is the most important feature for predicting the labels

Percentage Correctly Classified

Model Feature Importances



Anomaly Detection Results

Anomaly detection was used to identify potential data quality issues that may have influenced a stocks key metrics.

- An Isolation Forest algorithm was used to identify anomalies
- Features to investigate for data quality issues include:
  - Revenue per share
  - PE Ratio
  - PS Ratio
  - EV to EBITDA
  - EV to Free Cashflow
  - EV to Operating Cashflow
- The algorithm found that 4.6% of the stocks had potential data quality issues

Anomaly Detection Example

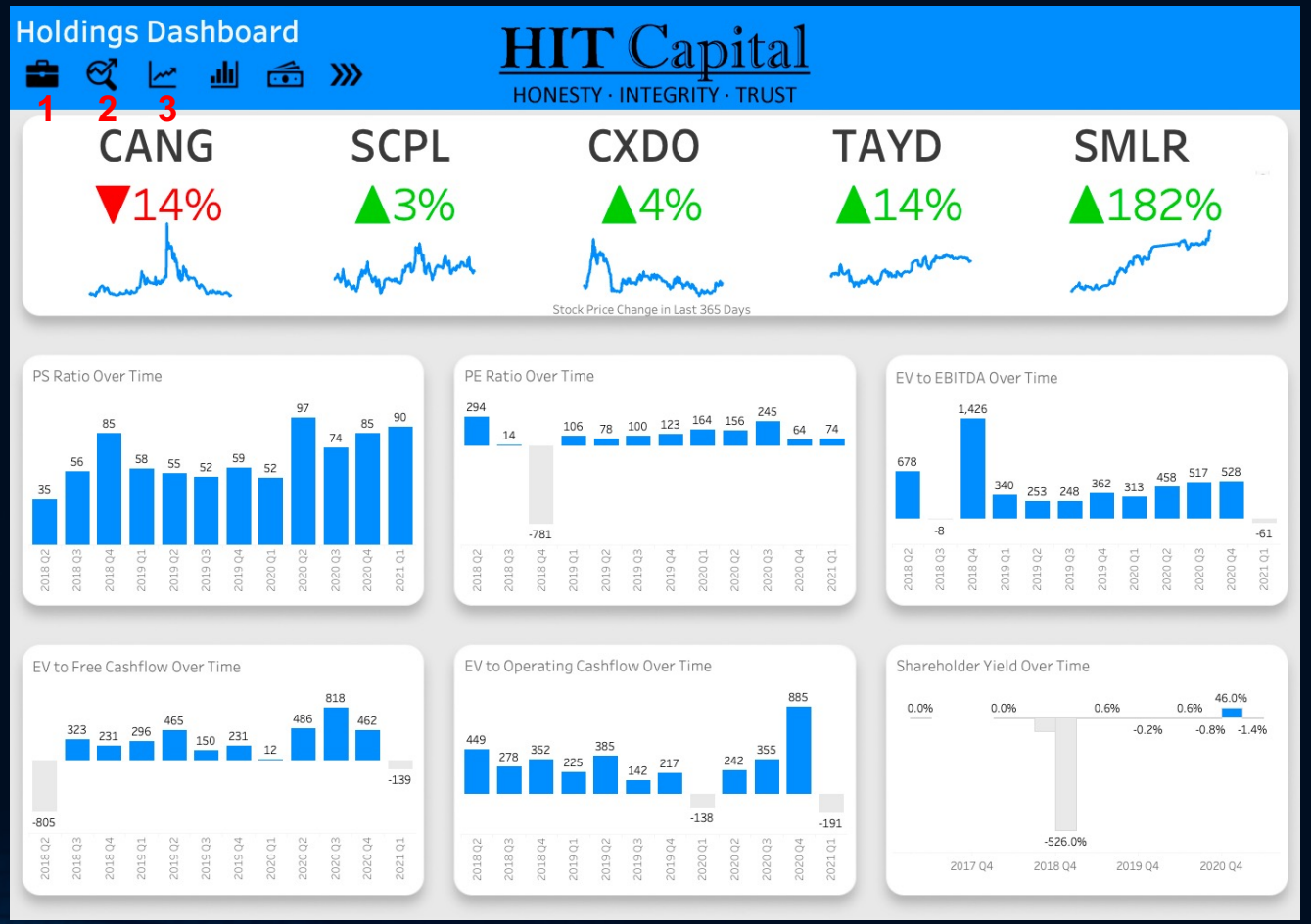
Symbol	Revenue Per Share	PE Ratio	PS Ratio	EV to EBITDA	EV to Free Cashflow	EV to Operating Cashflow
IIVIP	26,456	0.14	.01	.07	.1	.07

Stock Performance Dashboard

A Tableau dashboard was built to aid in the discovery of inefficient stocks. The dashboard allows a user to explore key stock information in an interactive visual experience.

3 Main Dashboard Functions (icons labeled on the picture):

1. View performance of current holdings for potential sale
2. Research new companies to buy
3. Validate underlying data quality



Dashboard Demo

Recommendations & Improvements

Based on analysis findings, it is possible to utilize historical stock metrics to prioritize which stocks to further evaluate for investment via the Tableau dashboard.

Recommendations

Review Current Holdings

Quickly gain insights into the performance of current stock holdings

Research Stocks for Potential Investments

Evaluate stock performance to identify new stocks to Buy

Explore Anomalies in Data Quality

Ensure the underlying data quality for a stock's performance is accurate

Future Improvements

Make a Live Connection

Create a live pipeline which feeds refreshed data to the dashboard automatically

Thank you

Questions?

Appendix

Data Overview

- Sourced data from FMP's API
- 4311 stocks after removing null or negative values and removing highly volatile sectors
- Pulled company profile information, historical performance metrics and stock price