



Base Metals Price Forecasting From Alternate Data Sources Using AI

Founded in 2008, Four Elements Capital is a specialised commodity asset manager focused on delivering absolute returns through a fundamental systematic investment approach.

Based in Singapore, Four Elements Capital is research driven with a strong dedication to processes & analysis.



"The integration of AI in the financial domain is the challenge that will make Singapore the global financial center of the future. AI Singapore, together with their research partner NUS NEXT Research Centre, has enabled Four Elements Capital to make this transition."

Lionel SEMONIN, Managing Director

BACKGROUND

- Base metals, used as materials for the construction of infrastructures and various types of products, are fundamental for human development
- Base metal prices are stochastic and highly non-linear as influenced by many factors with complex relationships
- They are also affected by macro-economic situations such as currency exchange rates and government policy changes e.g. increase in import tax rate
- Valuable information can be mined from alternative data sources such as news, specialised forums, reports, social media and demand forecasts by various courtiers and related companies

OUTCOMES

Machine learning framework outperformed traditional linear model benchmarks on out-of-sample forecast accuracy for 1, 3, 5 and 10 day horizons	New technologies were developed to utilise alternative data relevant to base metal trading e.g. news and analysts reports to derive short-term price movement indicators	Source code has been deployed and tested on Four Elements server	Implementing the AI solution in the financial world would strengthen and develop Singapore as a leading Fintech hub	Potential spin-off and scaling of this technology would help Singapore financial institutions, business owners as well as government entities better manage their risk exposure
--	--	--	---	---

BUSINESS CHALLENGE

How can Four Elements Capital leverage machine learning techniques to improve the prediction of spot prices of base metals using market data (trading prices and volumes); macroeconomic data; supply and demand data; third party estimations and relevant social media information (alternative data)

AI SOLUTION DEPLOYED

A machine learning framework consisting of three components:

- Classification of price movement direction using an ensemble of multiple machine learning and deep learning models
- Regression of price predictions using a deep learning model
- Filter mechanism to align the outputs from the above

News and Analyst Report Indicators were also developed to extract intelligence from alternative data sources and calibrate the classification outputs

*This research was done on the Alphien platform (<https://www.alphien.com/>)

