**Joint-University Algo Trading Challenge 2020/21**

**Trading Proposal**

**Team Profile**

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| Team Name: | AlphaBoom |
| University: | The Hong Kong University of Science and Technology |
| Team Member(s): | LIU, Dingdong |
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**Executive Summary**

Trading idea:

Consider the price of CNY and USD, sell USD when their difference is big, buy when it’s small.

Trading Hypothesis and Philosophy:

We can use our constructed and trained model to predict the future price of CNY and USD. The risk can be controlled by setting some constraint on the parameters of the model during training. Thus, it can be guaranteed that the trading strategy can earn profit.

Which market:

(Forex) foreign exchange market.

Data Input:

Dollar index, federal funds rate, CPI, exchange rate between CNY and USD, oil price and S&P500. Such data that represents USD price changes or other factors that may cause changes in USD price.

eg. High level description of your trading idea. Any trading philosophy/hypothesis behind your strategy? What financial market/ instruments your strategy apply to? What kind of data/ inputs your strategy use?

**Implementation Details**

The exact trading logic is to first predict the exchange rate between CNY and USD (CNY/USD), then buy in USD when the rate is low and sell USD when the rate is high. We will set an threshold for the rate change. When the rising or falling exceeds the threshold, we will tigger a trade. The threshold havem’t been set yet, but we will use 0.001 as the initial value and tune this hyperparameter in the machine learning algorithm.

The trading logic is quite simple, and the most challenge part lies in precisely predicting the future exchange rate. We first find the influenatial factors to the exchange rate. We red from papers to find some potential factors that influence the exchange rate such as the dollar insex, the federal funds rate, CPI, exchange rate, oil price and S&P500. We will also try to calculate covariance between other variables to find some potential factors. Secondly, we will try to train a LSTM model on the selected variable to predict the future exchange rate. Thirdly, we will implement a simple traiding algorithm that takes in output of the LSTM model (future exchange rate) and then tigger trades. These three steps are integrated and called as a pipeline. Finally we will keep inproving the whole pipeline by improving inference speed etc.

We used theories of statistics in fitting the prediction model.

The greatest assumption is that the market remains static in the near future. We assume no events will cause sharpe change in exchange rate. We also assume that the influence news have on the exchange rate is not severe (i.e. case a increase or decrease exceeds 20% in a few days).

##搜索汇率市场买入的算法（高点卖出，低点买入）

eg. What is the exact trading logics? What conditions will trigger trades? How do you derive the trading model/ logic? What theories/ methodologies you applied? Any assumptions made?

**Risk Management**

What are the risk factors? What is the worst scenario? How do you manage the risks? Risk factors

Natural disaster

Policy change

Fluctuation in monetary policy

Change inbound and outbound tax rate

Built of business initiative

Payment and lease of government bond

Strike

Change of ACCT regulations

Environmental Factors

uncatchable loss of USD

Worst Scenario

related to financial crisis

Risk management

previous related issue data included

consider the trend after unpredictable isssue

eg. What are the risk factors? What is the worst scenario? How do you manage the risks?

**Capital Management**

When to stop the algorithm

eg. Does your strategy utilize the investment capital? How do you manage the funding liquidity? Is your strategy scalable? What is the minimum capital required to execute your strategy? Can your strategy still work if the investment size become very large?

**Expectations for real-life implementation**

The most unfavorable situation is that the Exchange market is frequently influenced by unpresedented news such as policy changes. Idealy, our stategy works automagically, but requires human interference when unprecedented situation such as sudden policy change. Human need to adjust an parameter by hand.

The frequence of trading is highly dependent on the threshold we set. Under default setting, it is expected that the trading tiggers every a few seconds.

The ideal investment size

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Potential issues includes network issue. If we face high latency in acquiring the data, we may fail to response in time and trigger corresponding trades accordingly.

达成了经济共识之类的，达成合作之类的。加上什么时候有利或者有害

eg. What market situation(s) would be (un)favorable to you? Can your strategy fully automate, or need human interference? How frequent your strategy trades? What is an ideal investment size to execute your strategy? Any potential issues for real trading?