# FRE 7801 Final Project Proposal

*Team Member: Zheyu Gu NetID:zg589*

## 1. Topic: Pairs Trading for Dual-listed Stocks in A/H Markets

There are lots of Chinese companies which have public stocks in both mainland China stock markets (A shares) and Hong Kong Exchanges (H shares), and I would like to use the mean-reverting price differentials to form pairs trading strategy in these stocks.

## 2. Motivation

Even though the prices of a specific dual-listed stock should be same or very close to each other in the ideal scenario, research has shown there has been existing some price differentials in companies' A shares and H shares. Some of the reasons contributing to this fact can be restricted capital flows and information asymmetry, and I would like to exploit this opportunity by applying dynamic pairs trading strategy on some of the A/H dual-listed stocks.

## 3. Methodologies

In constructing the pairs trading strategy, I am now thinking about three different methods to come up with trading signals. The first one is based on traditional rolling window regression on two stock prices, and the second one is based on Kalman Filters for more dynamic beta updating. Both of these two methodologies focus on short-term mean reverse feature of stocks' relationships. On the other hand, the third methodology assumes the stock prices in A and H markets will eventually converge back to the same level in the long-term, so its trading signals are based on the position of the changing beta against 1 (which indicates the situation where two prices are exactly equal). In addition, I will also split data into validation and testing datasets so that I can optimize all important parameters in each of these three methods.

## 4. Data

To better understand the effectiveness of this strategy on A/H markets, I will implement the strategy on companies which well represent their own sectors. As for now, some candidates are the followings: BYD Company (vehicle & electric vehicle manufacturing), Tsingtao Brewery (food & beverage), ZTE (telecommunication), Sinopec (energy), China Southern Airlines (airlines), China Merchants Bank (financials), and Jiangxi Copper (industrial). Any adjustment to this list is possible based on my discretion. For each company, I will try to get data for time range as longer as possible, and I will potentially choose recent 3-5 years' data to be my out-of-sample testing data, depending on the lengths of available data for each company.

## 5. Trading Execution

If time allows, I will try to make the backtesting even closer to the reality by taking into consideration of the prohibition of short selling in mainland China stock markets. Therefore, I will not execute any trade in the event that A shares are overvalued than H shares, and this change will lead to less trading activities and closer simulation to the reality.