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August 2015

# STOCK MARKET SIMULATION

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By

Yifan Shao

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## **Abstract**

Using tools and information available from the Internet, a five-week stock market simulation was performed to understand the different effects of short-term trading and long-term trading strategies. The total profits gained by the two methods were compared to determine which method was more effective for stock investment. The experience of this project could lead to a better comprehension of the stock market and will be helpful for actual stock market investment in the future.

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# **1. Introduction**

## **1.1 Goal, Scope and General Plan**

The objective of this IQP for the team is to obtain some basic understanding of Chinese stock market by trading within the market. At the end of the five-week simulation, the team should also reach the final goal of the project by gaining a minimum profit of 5% of the initial investment. To fulfill objectives stated above, the team will start by gathering fundamental knowledge about Chinese stock market such as regulations, operating procedures, etc. After that, the team will use online simulation software or websites to conduct the five-week-long stock market simulation. During the five weeks, a hypothetical amount of 200,000 Chinese Yuan will be divided equally into two portfolios and used as initial investment to trade five selected stocks. Different trading strategies will be applied to the two portfolios. In Portfolio I, the team will constantly buy and sell stocks throughout the simulation period. On the other hand, in Portfolio II, team will use all the funds of the portfolio to buy five stocks for long term holding. At the end, the team will analyze and compare the profits generated by the two trading strategies and calculate the net profit from the simulation. After the five-week simulation, the team hopes to gain some experience with the stock market and use knowledge learned in the process to help manage future investments in real market.



## **1.2 Chinese Stock Market History**

The earliest record of stock market in China can be traced back to Qing Dynasty. As capitalism thrived in China at the early 20th century, the Chinese stock market flourished as well. The city of Shanghai turned into the center of all those stock market trades. After Second Sino-Japanese War, Shanghai Stock Exchange was rebuilt under the order of Chinese Nationalist Party. However, when Chinese Communist Party seized control of Shanghai in 1949, Shanghai Stock Exchange was shut down by the CCP, and the Chinese stock market activities were suspended for nearly forty years [10].

Until the reform of economic system in 1980s, the stock market activities restarted. Shanghai Stock Exchange opened to business at December 19th, 1990, and Shenzhen Stock Exchange began its operation at July 3rd, 1991. In 1992, Shanghai Stock Exchange listed its first stock which was issued by Shanghai Vacuum Tubes Limited Company. In 1996, the Chinese stock market first introduced price limits to stock prices to control unreasonable price fluctuation of a stock [10].

## **1.3 Shanghai Stock Exchange and Shenzhen Stock Exchange**

Shanghai Stock Exchange is a stock exchange based in Shanghai, China. By May, 2015 its market capitalization reached 5.5 trillion in US dollars [6]. SSE started its operation on December 19<sup>th</sup>, 1990 and currently is under supervision of China Securities Regulatory Commission, a ministry-level institution of State Council of People's Republic of China. The securities listed in SSE can be divided into three categories: stocks, bonds and funds. The bonds

are further divided into treasury bonds, corporate bonds and convertible corporate bonds while only two kinds of stocks are listed in SSE: A share and B share. The operation time for SSE is from Monday to Friday every week. On every trading day, the morning session starts from 9:30a.m. to 11:30 a.m. and the afternoon session begins at 13:00 p.m. and ends at 15:00 p.m. The stock market is closed during weekends any other national holiday announced by SSE, for example, Chinese New Year, Duanwu Festival and National Day, etc. [6]

The most commonly method used for SSE market performance is the SSE Composite Index whose base period is total market capitalization of all stocks listed in SSE on December 19<sup>th</sup>, 1990. The calculation of the index involves the price of all stocks listed in Shanghai Stock Exchange, including A share and B share stocks. The index is calculated using Paasche weighted composite price index formula, using December 19<sup>th</sup>, 1990 as the base day and 100 as base value.[6] The formula can be expressed as:

$$\text{Current Index} = \frac{\text{Current Total Market Capitalization} \times \text{Base Value}}{\text{Base Period}}$$
$$\text{Total Market Capitalization} = \sum (\text{price} \times \text{shares issued})$$

Due to different economic system, stock market in SSE has very different listing requirements for corporations which wish to list themselves in SSE. The requirements are as following [6]:

1. Its shares must be approved China Securities Regulation Commission (CSRC) and publicly issued.
2. The total capital stock must be no less than 50 million in RMB.

3. Its publicly issued shares must be accounted for at least 25% of its total shares. In cases which the total capital stock of the issuer exceeds 400 million in RMB, the publicly issued shares is required to be accounted for no less than 10% of its total shares.

4. The issuer cannot have major legal violations and false records in its financial and accounting reports within last three years.

5. Other requirements stipulated by SSE.

SZSE is the abbreviation for Shenzhen Stock Exchange, which was established on December 1<sup>st</sup>, 1990. It is a self-regulating institution supervised by China Security Regulatory Commission. Its major duties and functions include providing facilities and locales for securities trading, setting operational rules, receiving applications and arranging security listing, organizing and supervising security trading, regulating listed corporations and etc. Its operational hour is the same as that of Shanghai Stock Exchange. Both A shares and B shares are allowed to be traded in SZSE. The A shares stock market is divided into three boards: Main Board, SME Board and ChiNext. The Main Board was established in 1986 and it has evolved and grew along with economic system reform of China. During the past decades, SZSE has continuously expanded its market to meet the need of booming economy of China. By 2012 it has raised nearly 881 billion in RMB (about 140 billion US dollars) and is serving an irreplaceable role in Chinese stock market. On the other hand, SME Board (Small and Medium Enterprise Board) is more focused on small and medium companies. It has lower listing requirements comparing to Major Board and it gives opportunities to smaller companies and corporations. Last but not the least, ChiNext

is the newest board created by SZSE. It was launched on 23 October, 2009, and it has even lower listing standard in comparison to SME Board. Its listing companies are mostly high-tech and high-growth startup companies, making ChiNext Board similar to NASDAQ of United States. Like SSE, all listing activities need approval of China Security Regulatory Commission due to the nature of socialism economic system of this country. Indicators such as SZSE Component Index, SZSE Composite Index, SZSE SME Price Index and SZSE ChiNext Index are commonly used to evaluate the performance of the stock market in SZSE and the calculation formula is the same as that of SSE. [7]

## **1.4 A Share VS B Share**

A share is priced in local currency, RMB. On the other hand, B share is quoted in US Dollar in Shanghai Stock Exchange and in Hong Kong Dollar in Shenzhen Stock Exchange. In the beginning, A share stocks were only available to domestic investors and B share stocks were exclusively tradable to foreign investors. However, in 2001 authorities announced legalizing B shares stock trading among domestic investors. Furthermore, government declared stock market reform in 2002, allowing foreign institutional investors who met certain qualifications to trade in A shares stock market under Qualified Foreign Investor Program (QFII). However, this privilege comes with limitations and foreign investments in China are under strict regulation due to foreign exchange control. The rules for QFII had been revised for several times during the past decade. In 2012, 66 licenses had been granted to foreign investing institutions and a total quota of 14.4 billion in US Dollars had been approved by the government. Similarly, Chinese

government restricts its citizen from investing abroad. Even Hong Kong is part of China now; people from mainland still are restricted from trading stocks in Hong Kong Stock Exchange. Some companies list their shares not only in the two major stock exchanges in mainland, but also list their shares in Hong Kong Stock Exchange. These shares of stocks issued by the companies are called H stocks and quoted in Hong Kong Dollars. However, people from mainland cannot trade H stock freely because of government regulations.[6]

## **1.5 Commissions and Other Fee**

The fee occurred when buying and selling stocks are composed of three parts: stamp duty, transfer fee and commission. Commissions are collected by agencies which a person used to trade stocks, and can vary from 0.03% to 0.3%, depending on specific agency. However, the stamp duty is collected by the government and it's unavoidable for any amount of trading. This fee will be the 0.01% of the trading amount and applied only to the seller of the stock. The last but not the least, the transfer fee would be applied to both sides of the deal if the deal involves stocks listed in Shanghai Stock Exchange. Furthermore, sometimes a supervision fee will be applied to deal depend on the specific situation. [6]

## **1.6 Stock Market Histograms**

Nowadays traders use various charts and graphs to assist them to understand the performance of the market and predict where the market will end up in the future. The most frequently used graphs are candle stick chart and line chart. To operate in simulation, the team

should learn to interpret the market in the first place. For example, Figure 1.1 is a typical candlestick chart and Figure 1.2 is a common line chart of market composite Index.

### 1.6.1 Candlestick Chart

As one of the mostly used financial chart, candlestick chart was especially popular among Asia stock market traders. The candlestick chart is very similar to box chart which was used in Statistics. Figure 1.1 is a typical candlestick chart. According to history, the first person who



Figure 1.1 Example of Candle Stick Chart

invented candlestick chart was a Japanese rice businessman. He used this method to record the price of the rice in the market and later this technique was widely used by others [1].The candlestick chart has only two colors: red stands for closing price is higher than opening price and blue represents the opposite situation. In the special case, if closing price and opening price are the same, the chart will look like a cross. The horizontal lines represent the opening price and closing price. If the tips of two vertical lines point upwards and downwards means highest and

lowest price of the day. Possessing that knowledge, a trader can effortlessly understand the price distribution of one specific stock over the past weeks and months. What needs to be clear is that the price is arranged from high to low in the vertical direction. So if the candlestick is red, the closing price will be in a position above the opening price. Vice Versa, if the candle stick is blue, the closing price will be in a position which is lower than the opening price of that day. Nonetheless, there are five curves with five different colors to represent the average stock price over certain days. For example, the white, yellow, green, purple and blue curves separately stand for 5-day, 10-day, 20-day, 30-day and 120-day average price.

### **1.6.2. Line Chart**

Line chart can be easily interpreted even by a person without professional knowledge to the stock market. Figure 1.2 below is an example. Line chart can be further divided into composite index chart and single stock price chart. For composite Index Chart, the market Index is plotted on Y axis, meanwhile, time is plotted on X axis. The white line represents the weighted composite market index while the yellow line stands for market index without being weighted. In cases of price chart of a specific stock, the market Index on Y is replaced by the price of this stock throughout the day. Also, the market price index curve will also be shown as a yellow line in the chart as reference in the chart so that the trader can see how the stock performs against the whole market. At the lower part of the chart, the increase and decrease in market index is transformed into red and green bars. Being widely known in Chinese stock market, red

symbolizes increase, and green stands for decrease. At the bottom of the chart, the bar lines are the trading volume of every minute, in unit of 100 shares.

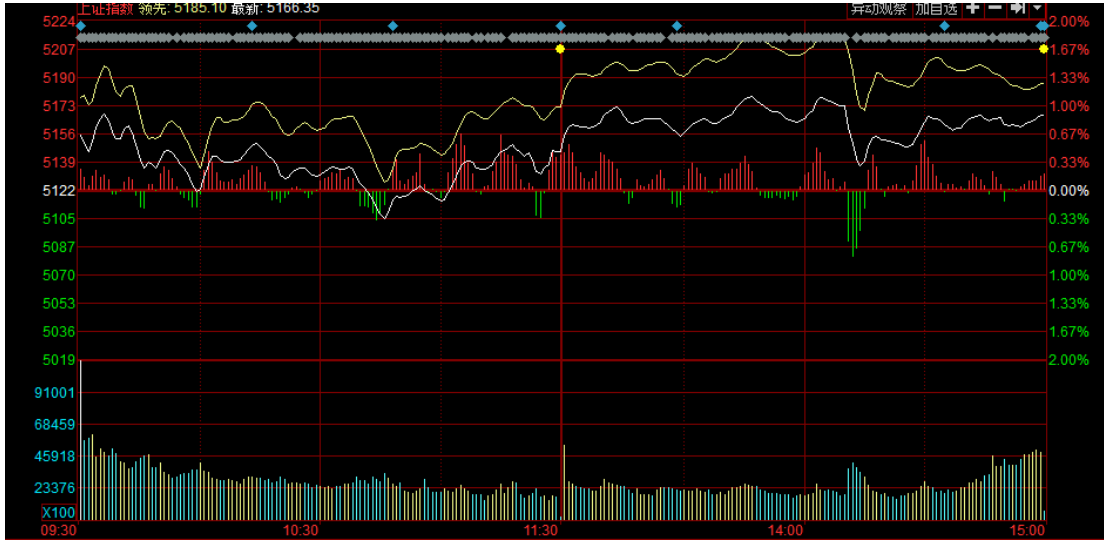


Figure 1.2 Example of Line Chart

### 1.6.3 Exponential Movement Average

EXPMA or EMA is the abbreviation for exponential movement average. Its principle is still taking average value of closing price and reach predictions according to the interpretation of the calculation results. It can be expressed in the following formula:

$$EMA = \frac{\text{closing price of current period} - \text{closing price of last period}}{\text{number of days}} + EMA \text{ of last period}$$

Comparing to DMA and MACD, EXPMA gives more weight to stock price of current day or term. EXPMA has less hysteresis quality than MACD and less forward quality than DMA in some degree. In general, EXPMA is a popular and useful tool for the traders in the market. Figure 1.3 is a sample of EXPMA graph. It included candlestick chart of the stock price, short term EXPMA line and long term EXPMA line. The yellow, blue, red and green line represents



5-day, 10-day, 20-day and 60-day EXPMA line separately. The vertical axis is the stock price while the horizontal axis marks the time.



Figure 1.3 Example of EMA

From the relationship between the candlestick charts, short term EXPMA line and long term EXPMA line, a person can tell the performance of this stock and predict the future price. When short term line is on top of the long term line, the stock price is believed to increase in the future, and the stock price is considered going to drop when long term line is on top of short term line. Usually if the short term EMA line crosses the long term EMA line from below to above, it is interpreted as buying signal while the opposite phenomenon is read as selling signal. If the candlestick line breakthrough the short term EXPMA line from below while the long term is on the top of the two lines, it is a good time to buy in the stock. Assume the candlestick line continues to go upward and cross the long term EXPMA line, eventually making the short term EXPMA line going downward, the stock price in the market will drop in the future. Then at this moment the best strategy is not trading but waiting, because the market's expectation of this stock price is probably changing from positive to negative. However, if candlestick line

breakthrough the short term line while long term is below short term line and candlestick line, the investors should consider to sell the stocks because the price is probably at a high point in that frame of time. If the candlestick line continues to go through the long term EXPMA line, the investors should buy in more this stock because the general market believes that the price of this stock will be higher in the future. In both cases, the candlestick line will show a tendency of converging with the long term EXPMA line after breakthrough the short term EXPMA line. In a short word, EXPMA line is more suitable for day traders and swing traders. This method has rather high accuracy and success rate and it's a very useful tool for swing traders to determine right entry and exit time point. [4]

### 1.6.4 Moving Average Convergence/Divergence

MACD is the abbreviation for moving average convergence/divergence. Figure 1.4 is an example of MACD. It is a widely used trading indicator in technical analysis of stock price. It was firstly created in 1970s in order to disclose the changes in strength, direction, momentum

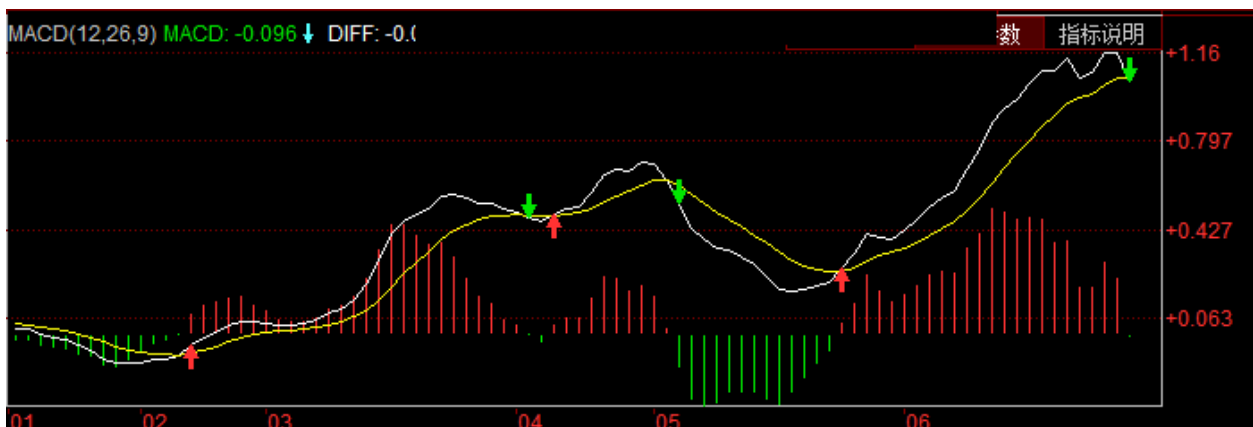


Figure 1.4 Example of MACD

And time span of a trend of the stock price, and it is consisted of three time series calculated from historical price data: MACD series, average series and divergence series. MACD series is difference between a 12-day period exponential moving average and a 26-day period exponential moving average of the stock price series while the average series is the exponential moving average of the latter; and divergence series is the difference between the two former series. The most common used type is MACD (12, 26, 9), and the numbers are representing 12-day, 26 day and 9-day period. As introduced before, 12-day and 26 day period are used to calculate MACD, and 9-day period is used as the time period for average series. So in the graph, on the basis of MACD, a 9-day exponential moving average of the MACD is added as the signal line to mark the time point to buy and sell. The divergence is shown in bar graph with red and green color, indicating its nature of positivity and negativity. When MACD line crosses with signal line, it is called as signal line cross over. In a situation referred as “bullish crossover”, the MACD line goes upward through the signal line, marking it a good opportunity to buy in the stock because there’s a likely an increase in stock price in the future. In the opposite, in “bearish crossover”, the MACD drops through the signal line, revealing a possible decrease in stock price in near future; and the investors should enter short position in this case. In other cases such the MACD line crossing the zero reference line, it is called “zero crossing”. Normally, a breakthrough from negative to positive is interpreted as bullish, and a breakthrough in the opposite direction is considered as bearish. The investors should buy in stocks in bullish time and sell out during bearish periods. Comparing to signal cross, zero cross is less certain about the directional

tendency of the movement in the stock price. The contract in the histogram bar reveals that the strength of the trend is weakening while the change in color shows the change in the direction of the trend. Of course, MACD has its own disadvantage. For example, it sometimes generates false results. So the traders often use filters to increase the accuracy of the MACD results. [5]

### 1.6.5 Stochastic Oscillator

Stochastic Oscillator, also referred as KDJ, was created by George Lane, and it was originally applied in the futures market. It was used to predict the future price turning points according to the closing price, lowest price and highest price within a certain amount of time for a single stock. The figure below is an example of Stochastic Oscillator.

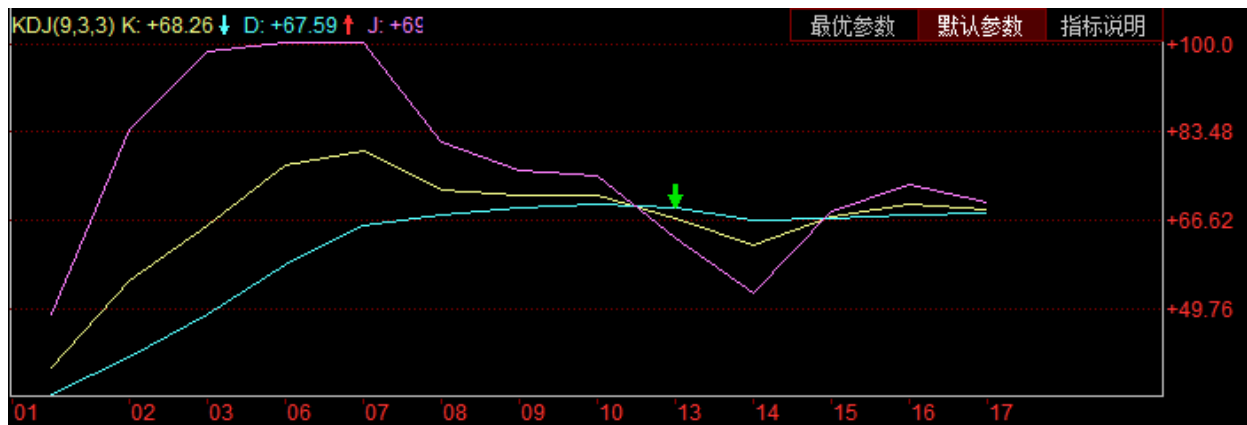


Figure 1.5 Example of KDJ Index

In the example above, the period selected for %K value, %D value and %J value are 9 days, 3 days and 3 days respectively. The line with color yellow, blue and purple stands for them separately. It collects the highest price, lowest price and closing price within a certain range of time and calculates the ratio between the three of them. The result will give off a RSV, which is abbreviation for Raw Stochastic Value. RSV is mainly used for analyzing the status of the

market, whether it's in overselling or overbuying condition. After the RSV, %K, %D and %J values will be calculated using moving average. The values can be calculated using following formulas:

$$N \text{ day RSV} = \frac{C_n - L_n}{H_n - L_n} \times 100$$

Here  $C_n$  stands for the closing price on the  $N$ th day, while  $L_n$  is the lowest price within  $N$  days. Also,  $H_n$  represents the highest price within  $n$  days.

$$\%K \text{ of current day} = \frac{2}{3} \times \text{previous day's \%K value} + \frac{1}{3} \times \text{RSV value of current day}$$

$$\%D \text{ of current day} = \frac{2}{3} \times \text{previous day's D value} + \frac{1}{3} \times \%K \text{ value of current day}$$

$$\%J \text{ of current day} = 3 \times \%K \text{ value of current day} - 2 * \%D \text{ value of current day}$$

Because %K value and %D values are ratios, the actual value of %K and %D will always be between 0 and 100. When %D value is over 80, the market is in an overbuying status. If %D value goes below 20, it means that the market is overselling. If the %K value line and %J value line go upward and break through %D value line and showing a bullish crossover, the trader should start to buy in the stock because the stock price is about to go up. On the other hand, in situations that %K value goes down and breach the %D value line, revealing to be a bearish crossover, the signal will be treated as a selling opportunity. When the accelerations of the rising %K value and %J value are decreasing, it signals that the price trend will start to go down in terms of a short time period. Vice Versa, if the %K value and %D value are experiencing increasing acceleration in their trend, a probable change of the direction of the price might be present or about to appear. Among three of the values, %D is the most insensitive comparing to %K and %J value.

However, %J value line is the most sensitive among the three. Yet, KDJ values are not perfect and they have their own disadvantages. For example, KDJ values are more accurate when applied to large capital stocks, and when applied to small capital stocks, the results will be less reliable. [3]

## **2. Trading Strategies**

Typical trading strategies include day trading, swing trading and trend following. The team reviewed the three methods to get basic knowledge about them and chose two most viable strategies for simulations. In the end, the team eventually picked swing trade and trend following strategy and performed simulations abides by the principles of these two methods. The trading results were compared to see the effectiveness of each method.

### **2.1 Day Trading Strategy**

The definition for “Day Trading” is buying and selling the stock on the same day. Day traders seek to make profits by putting large amount of capitals in highly liquefied stocks [2]. When small price movements occur in the stock, the trader can make profit because of large amount of capital investment. This strategy is very similar to gambling. If the trader’s prediction was correct, he can walk away with his rewards. However, if the calculation or anticipation did not meet the realistic market, the trader will suffer heavy loss.

When using Day Trading Strategy, a trader will pay attention to the liquidity and volatility of the stock. Volatility is the measure of the predicted price range of the stock on the day the trader operates. Greater volatility means higher possible profit or loss from the trading. Liquidity measures the difficulty of buying and selling stock. [2] High liquidity means tight spread and low slippage, making the trader able to buy in and sell out this stock at a good price.

Once the stock is chosen, an exit point should be selected. The price target can heavily depend on personality and trading style. The common day trade techniques are scalping, fading,

daily pivots and momentum. As one of the most popular strategy, scalping requires the trader to sell the stocks almost right after when the stock price become profitable. The price target is just after profits are obtained. The second strategy, fading can be simply expressed as buy in when price is falling and sell when price is rising. This strategy is based on assumption that the stocks are overbought, the early buyers are ready to sell and existing buyers are scared out. The nature of this strategy makes it very risky, yet it also can be extremely rewarding in a short term if the trader do it right. Traders who wish to operate with this strategy need to have high risk tolerance. The target price is when the other buyers start to buy this stock again. Next, daily pivots strategy is similar to the previous technique. It involves buying at the lowest of the day and selling at the highest of the day. The differences between the second strategy and the third strategy is that daily pivot strategy is more focused on price of a day, and fading strategy has shorter time period. After reaching the high price of a day, the trader can collect his profit when the stock price starts to fall again. Last but not the least; momentum strategy involves trading according to news releases and high volume trending. The trader can either choose to hold the stock until the next reversal sign or just fade the price surge. Decrease in volume is usually considered as the target price in this strategy.[2]

Even though a person can profit from day trading, he can also lose money from this strategy. As a result, setting a stop-loss is very important to a person who wishes to do day trade. A physical stop-loss means a person will exit once the stock price dropped to a level that exceeds the tolerance of the person. On the other hand, a mental stop-loss can be implemented once the



market makes turns which are out of a trader's expectations. Among the retail day traders, there's another rule. The retail day traders usually set a maximum loss they can afford for a day and they will quit trading for the rest of the day if the maximum loss is reached. Inexperienced day traders who ignored this rule hopes to make up the loss during the rest of the day often end up with higher deficits.

Day trading is not a strategy that can be easily mastered. People who use day trading often possess features such as holding sufficient capital, having a good strategy, knowing about the marketplace well and being disciplined. However, for people who are new to this technique, enough practice and consistent self evaluation can improve the chance of making profit from the marketplace.

## **2.2 Swing Trading Strategy**

By the definition from Jason Van Burgen, swing trading is a technique in attempt the gain profit within one to four days. Similar to day trading, traders who use swing trade strategy concentrate on trends and volatility of stock price instead of the inherent value of the stock. In real world swing trading is position in between day trading and trend following. A day trader always buys in and sells out his stock within the same day while the time of holding the stock can vary from seconds to hours. However, trend following traders will hold the stocks for a few months. They will carefully study the trend of a stock before deciding to buy in. Swing traders, on the other hand, will hold on to the stock from days to weeks. [9]

Choosing correct stock and market are crucial to a successful swing trading operation. Ideal candidate stocks are large capital stocks which are actively traded in major stock exchange. The prices of this kind of stocks will fluctuate throughout the trading period, making it possible to make profits from price oscillation. However, in case of two market extremes, bear market and raging bull market, swing trading becomes a less effective strategy. In market extremes, even most actively traded stocks will not have significant ups and downs in their share prices. In this case, trend following seems to be a better strategy. The best time for swing trading is when the market index is oscillating but remaining on the same level. The price difference generated during the fluctuation period gives investors to turn stocks in their possession into economic gains.

A baseline value, which is portrayed on a chart with an exponential average (EMA), is proven by research and data to be a handful tool for swing traders. Once the trader uses EMA to find the baseline of a market chart, all buying and selling decisions can be determined according to stock share price at that time and the baseline value. Once the price hits the baseline value, the investor will decide following actions depending on trending direction. [9] However, in some situations, traders will not take actions immediately once the baseline value is reached. For example, an investor who is confident in his or her prediction of a stock will trade once the baseline value is hit, instead, the investor will give it some more time and wait for a strong uptrend and downtrend to make decisions.

Unlike day traders, swing traders do not need to enter and exit the market at exact perfect point of time. If the price trend is still strong after the price hits the base value, the trader can wait a bit longer until channel line appears. However, in a weak market, the trader can consider to take his profit even before the channel line is reached if the direction of trend starts to go in an undesired direction. [9]

In fact, swing trading is the most commonly used strategy among traders. Comparing to day trading, swing trading don't require that much personal market experience and investing capital. Also, unlike trend following strategy, the person who uses swing trading doesn't need to do careful research and deep evaluation of company stocks. The focus point of this technique is on the price of the stock instead of the intrinsic value of the stock. In general, this is a strategy is the most suitable one for beginning traders. The tyros can gain some experience and impression about the stock market using this strategy. Furthermore, more experienced traders can still make remarkable profits using this strategy.

## **2.3 Trend Following Strategy**

Trend following is another widely used strategy among investors. Traders who use this technique are trying to take advantage of trend movement in the long term and generate profit through analyzing an asset's momentum in a particular direction. In simple words, a trader will buy in stocks when the prices are trending upwards and sell out stocks when stock prices start to show signs of downward trending. [8] This kind of investors will enter long position once they believe certain market trend will last for a particular length of time. They normally don't try to

estimate how high or how low the stock price will get, instead they just go along with the trend and turn it into earning.

A trend following trader usually thinks more about how the market is doing than where the stock market will go in the future. For an example, if a trader realizes the market is going through a raging bull market, he or she will enter into long position. He may miss the initial profits generated by the earlier rising; or he didn't sell out his stocks when the stock price reached its peak. However, as long as trader sells his or her stocks near proper price, he or she will see profits. It is probably the easiest trading strategy in a raging bull market. All you have to do is enter at a relative low price and you can leave it to be for a while until downward trend start to emerge.

Another important rule for trend following is risk control. It is essential to contain losses caused by oscillations and downward trends. This can be achieved by series of actions in response to the market's performance. During the period which high volatility of prices is present in the marketplace, a trader might reduce the trading size in order to minimize possible loss to price fluctuation. In a losing money time, positions are reduced and trading sizes are cut to preserve the investment capital until more positive trends reappear.

Last but not the least; money management plays an important part in the whole trend following strategy. A trader has to consider how much money should be put into trading without having significant negative effects. Even in raging bull market, there will be mini bear markets along the way. As a result, it's very important for a trader to determine when to sell the stocks

and when to re-enter position. There are many useful indexes that can help a trader to monitor the price and condition of the market.

In a short word, every trading technique exists for its own reason and there's no single strategy can avoid random risks. After all, investment is a gamble of profits and risks. The greater the risk is, the better the rewards will be. Trend following strategy can yield very good performance in market periods with strong directional trending. Sometimes even combining two strategies will also be a good choice. For example, use trend following when in raging bull market and bear market; and use swing trading when the market index is fluctuating at the same level. The trading strategy selections are also based on personality and trading style.

### **3. Stock Selection and Research**

The following five stocks are chosen for the stock market simulation. All these five stocks are listed in Shanghai Stock Exchange. I chose these five stocks based on their categories: transportation, energy, electronics and communications and commercial services.

#### **3.1 China Eastern Airlines Corporation Limited**

Code: 600115

Name: CEA

China eastern airlines corporation limited, founded on 25 June, 1988, is an airline company headquartered in Shanghai, China. It's one of the major Chinese airline companies and operates domestic, international and regional routes. Its main hubs are Shanghai Hongqiao International Airport and Shanghai Pudong International Airport. Currently it's a member of Sky Team. As summer is coming, it's obvious that there will be a spike in passenger flow because of those students' return to home and journey to domestic places and foreign countries. All these will raise the demand of flight tickets; as a result, I predict that there will be an expansion in airline industry in the following weeks. [6]

#### **3.2 PetroChina Company Limited**

Code: 601875

Name: PetroChina

As a state owned enterprise China National Petroleum Corporation, PetroChina is a Chinese oil and gas company headquartered in Dongcheng District, Beijing. It was listed in Shanghai

Stock Exchange on 5 November, 2007; by now PetroChina Co., LTD. is the biggest company listed in SSE by its total market capitalization. In China mainland, PetroChina has issued almost 162 billion shares of its stock, accounted for 88.47% its total shares. The rest 21 billion shares of stock, accounted for 11.53% of total share, are being traded in oversea stock exchanges. By 5 June, 2015, its market capitalization is 2075.8 billion RMB [6]. Even though its stock price was hit in previous months because of the price of crude oil in commodity trading market, there's still hope that the price will rise again when crude oil price returns to normal.

### **3.3 Shanghai International Airport Co., Limited**

Code: 600009

Name: SIA

Shanghai International Airport Co., Limited owns two airports in mainland China: Shanghai Hongqiao Airport and Shanghai Pudong Airport, which are located separately at east side and west side of Shanghai city. It was initially funded under the approval of Shanghai city government on 28 May, 1998. By 5 June, 2015, the company has issued 1093 million shares to the market and has 62 billion RMB of market capitalizations in total. [6]

### **3.4 China United Travel Company Limited**

Code: 600358

Name: CUTC

CUTC, founded in 28 December 1998, is a company that invests and manages businesses in leisure holiday industry. After the approval of China Security Regulatory Commission, CUTC

was listed in Shanghai Stock Exchange on 22 September, 2000. By 05 June, 2015, its total market capitalization is 11 billion RMB. [6]

### **3.5 Sichuan Changhong Electronic Co., Limited**

Code: 600839

Name: Changhong

Sichuan Changhong Electronic Co., Limited, headquartered in Mianyang, Sichuan Province, is an international corporation that specializes in electronic manufacturing, communication and defense industry. Its precursor is the state-owned Changhong Machine Company founded in 1958. As one of the major national project bases, it was the only company in PRC that were able to manufacture airborne fire control radar. In the next six decades, the company slowly expands its business into electronic industry and communication industry. Now its domain covers television manufacturing, IT and communication, services and defense industry. There are around 4607 million shares of the tradable company stock in the active market. its market capitalization estimation is about 52 billion in RMB. [6] During the past five days, the stock price has risen approximately 15%, which is a very strong upward trend. Combining with price chart over a year's data, this stock proves itself to be worth buying. Figures below are the stock price of Changhong over 5 days and a year.



## **4. Portfolio I: Swing Trading Strategy Simulation**

The author of this project report was later referred as “author” in the following text. In this simulation, a portfolio with initial capital of 100,000 RMB was used for exercising swing trading. This portfolio was referred as “Portfolio I” in the following text. The simulation started on 8 June, 2015. The time length of holding a stock could vary from less than a day to more than a week, depending on the price of the stock and the total loss or gain of the stock. The author hoped to earn his profit by predicting the oscillation in the stock price.

### **4.1 Simulation Week I**

In the first week, In general, the SSE Composite Index started with 5042.79 on Monday and closed with 5164.68 on Friday. In the meanwhile, the author retrieved 8522 RMB of profit from the trading on Wednesday, and his total asset had became 108478.89 RMB. Table 4.1 below listed all trading activities of this week in Portfolio I. The index increased about 2.42 %, while the growth rate of the asset in Portfolio I was approximately 8.48%. The performance of the Portfolio I in week I had surpassed that of the market.

The author initially invested all the money in Portfolio I into Sichuan Changhong Electronics Co., Ltd. As the result, 8500 shares were purchased at 11.11 RMB per share. In the end of the day, the stock price the author decided to settle with 5% increase in stock price. Eventually, the author gained with 8522 RMB profit at an average price of 12.15 RMB per share.

Date	Name	Buy / Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
2015/6/8							100,000.00	
2015/6/8	Changhong	Buy	11.11	8500	94,537.94		5,462.06	
2015/6/9	Changhong	Sell	12.15	8500	103,059.94	8,522.00	108,522.00	8,522.00
2015/6/10	Changhong	Buy	13.37	3000	40,153.11		68,368.89	
Total Asset								108,478.89

Table 4.1: Transaction of Portfolio I in week I

On Wednesday, out of the author's expectation, the stock price of Sichuan Changhong continued to increase. At peak price, the single day growth was nearly 8 percent. However, the author was worried about such high price would result in large quantities of selling by other people. As the author expected, after the price reached its daily peak, the stock price started to fall. The author believed it was a chance. This time, author didn't invest all of his capital into the deal because of his worry for further decrease in its price in a near future. Only about 400,000 RMB worth of stocks were bought. On Friday, the author lost approximately 43 RMB from this single transaction, according to the closing price.. Figure 4.1 shows the price of Changhong over week I.

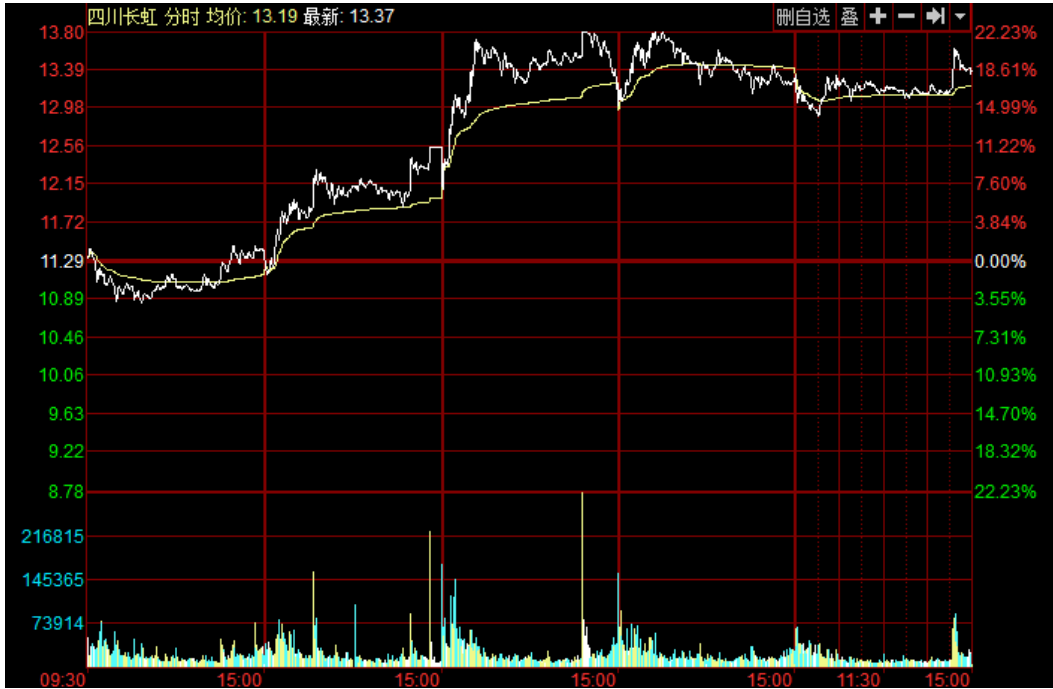


Figure 4. 1 Changhong Stock Price over Week I

For the next week, the author considered the option of using scalping because it seemed the stock price was out of potential of growth. The author was ready to sell all 3000 shares of Changhong once the stock price turned into profit. If the stock price continued to drop and the author did not have a chance to gain profit, the author would dump all 3000 shares of Changhong to stop any further loss once the stock price fall below 90% of its cost, which was around 12.03 RMB per share.

## 4.2 Simulation Week II

In contrast to his activities in week I, the author had more frequent transactions in this week. However, unlike last week's performance, the SSE Composite Index experienced a sharp fall from 5174.42 to 4478.36, yielding approximately 13.45 % loss in its value. By the end of this

week, all stock holdings in Portfolio I was sold. In general, the net profit in this week was negative, and the total asset decreased to 105766.41 RMB. In comparison to last week's total asset, there was a deficit of 2712.48 RMB. The loss rate was around 2.5%, which is smaller than the market.

Date	Name	Buy / Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
2015/6/15	CEA	Buy	12.18	2400	29,263.63		39,105.26	
2015/6/15	CUTC	Buy	27.6	1000	27,628.60		11,476.66	
2015/6/15	CHANGHONG	Sell	13.68	3000	40,954.92	801.81	52,431.58	9,323.81
2015/6/15	CUTC	Sell	28.75	500	14,345.74	531.74	66,777.32	9,855.25
2015/6/15	CHANGHONG	Buy	14.46	2500	36,188.65		30,588.67	
2015/6/16	CHANGHONG	Sell	14.7	2500	36,674.00	485.35	67,262.67	10,340.60
2015/6/17	CUTC	Sell	25.74	500	12,843.76	-970.54	80,106.43	9,370.06
2015/6/17	SIA	Buy	34.96	2000	69,991.92		10,114.51	
2015/6/18	CEA	Sell	13.27	2400	31,781.90	2,518.27	41,896.41	11,888.33
2015/6/19	SIA	Sell	32	2000	63,870.00	-6,121.92	105,766.41	5,766.41
Total Asset								105,766.41

Table 4.2: Transaction history for Portfolio I in Week II

On First day of Week II, the author sold out Changhong and bought in CEA, CUTC. Because of the slight deficit from last week, the author was looking for a point to sell all of them once they turned to be profitable. Luckily, a sharp rising trend emerged in the beginning of Monday afternoon. In response to this, the author sold 3000 shares of Changhong at market price of 13.68 RMB per share, and gained a profit of 801.81 RMB. After his action, the author realized that he sold the stock too early because the price was still going up quickly with no sign of stopping or slowing down. The author bet that the price would keep rising on the next day, and he bought in 2500 shares of Changhong at price of 14.46 RMB a share in the afternoon. In the meanwhile, the author also bought in 2400 shares of CEA at a cost of 12.18 RMB per share. The author thought that the stock price of CEA was experiencing a fluctuation on last Friday and would return to a higher price level. Believing that, author bought in CEA at the very beginning of the morning session on Monday. The stock price had a steep upward trend in the morning session and maintained at a level for the rest of the day. Last but not the least, the author observed a price oscillation in CUTC stock price. Around 11:00 a.m. on Monday, the price reached a relatively low level. In the end, the author traded in 1000 shares of CUTC stock at a price of 27.6 RMB per share. The price continued to go upward in the afternoon and almost reached the daily price limit of this stock. In this situation, the author decided to collect part of his revenue and sold half of his holding on CUTC at price of 28.75 RMB per share. From this trade, 531.44 RMB worth of profit was generated from the 500 shares. The rest 500 shares of CUTC were kept held by the author to see if there's even more profits can be harvested.

On the next day, the stock price of Changhong had a surprising fall in the morning session, making the author panic again. It reached its bottom, which was about 13.24 RMB per share in the middle of the morning session. The deficit for those 2500 shares Changhong at that moment was almost 3000 RMB, which was about 10% of the initial cost. The author nearly wanted to give up this stock. However, a strong bounce drove the stock price up to its daily highest price. Afterwards, minor oscillations occurred, and the price fluctuated in a range of 0.5 RMB per share. The author made up his mind and sold 2500 shares at 14.7 RMB per share during this period. The return in this transaction was 485.35 RMB. The Figure 4.2 below was the price chart of Changhong over week II.

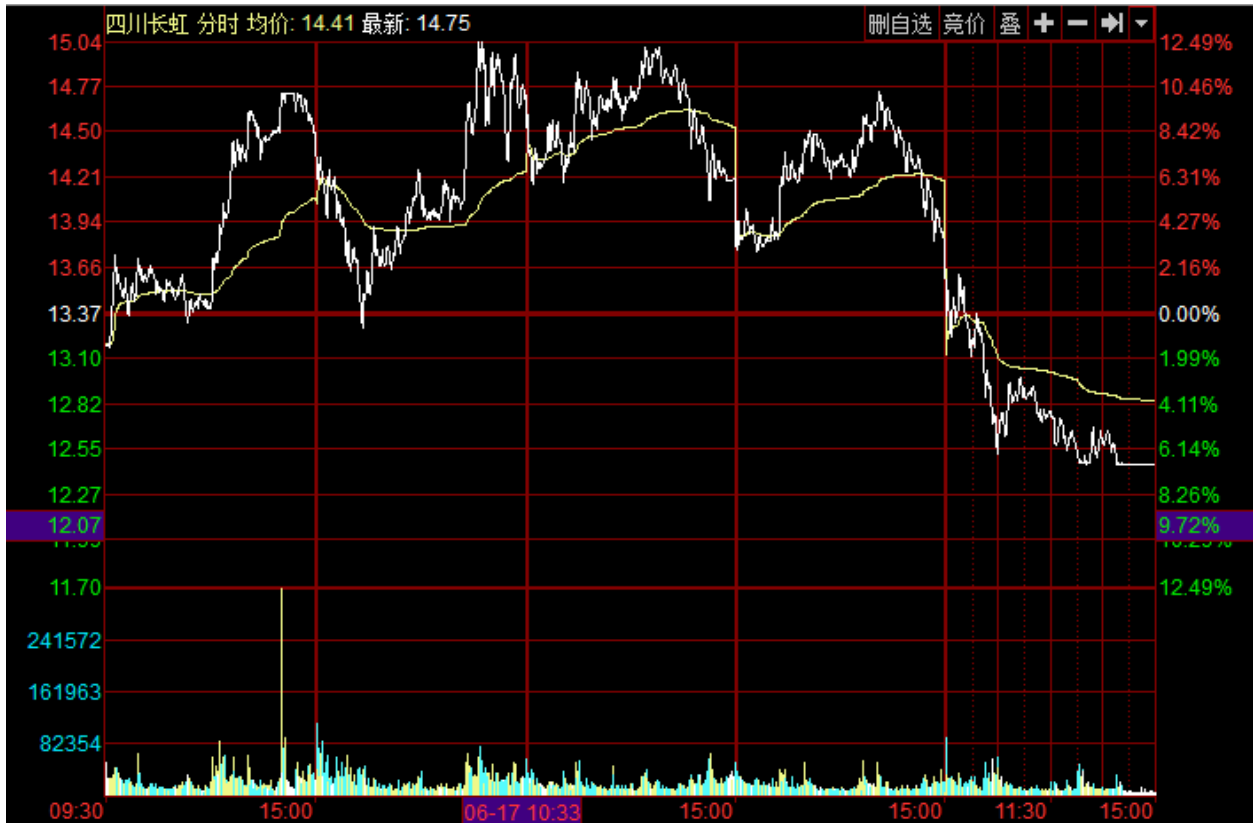


Figure 4. 2 Changhong Stock Price over Week II

In the meanwhile, stock prices of CEA had some minor fluctuations but still managed to realize growth at the end of the day. However, stock price of CUTC once reached a high level in the afternoon, and started to drop sharply in the later afternoon session. By the end of the day, the closing price was lower than the opening price. However, the author thought it was just an oscillation that shall be ignored. This thought was proven wrong in following days.

On Wednesday, the stock price of CUTC carried on with yesterday's downward trend. At price around 25.74 RMB per share, the author was forced to sell the remaining 500 shares of CUTC to contain the loss within 10%. In the end, the author lost 970.54 RMB from this deal. Nevertheless, stock price of CEA also went downward at a very fast pace. At one point the price dropped to 11.20 RMB per share, which was the lowest price of the day. Thought author didn't sell any CEA stock because the deficit hadn't reached author's 10% tolerance yet, even during the lowest point of the day. On the same day, the author bought in 2000 shares of SIA at price of 34.96 RMB per share because the author saw an opportunity to enter long position. Yet the author misread the trend, pretending a downward trend as a temporary price fluctuation.

By the end of Thursday morning, prices of most stocks the author chose had inverse growth; and the SSE Composite Index was also showing a downward trend. On the other hand, CEA showed a different upward trend in the morning session, reached 13.27 RMB per share swiftly. Figure 4.3 shows the sharp trend on Thursday. The stock price had some small ups and downs throughout the day, but maintained at its daily limit for about two hours. At that moment, the author began to worry that the market is experiencing a downward trend instead of insignificant

oscillations. To be safe, the author sold all 2400 shares of CEA at 13.27 RMB per share and gained 2518.27 RMB profit.

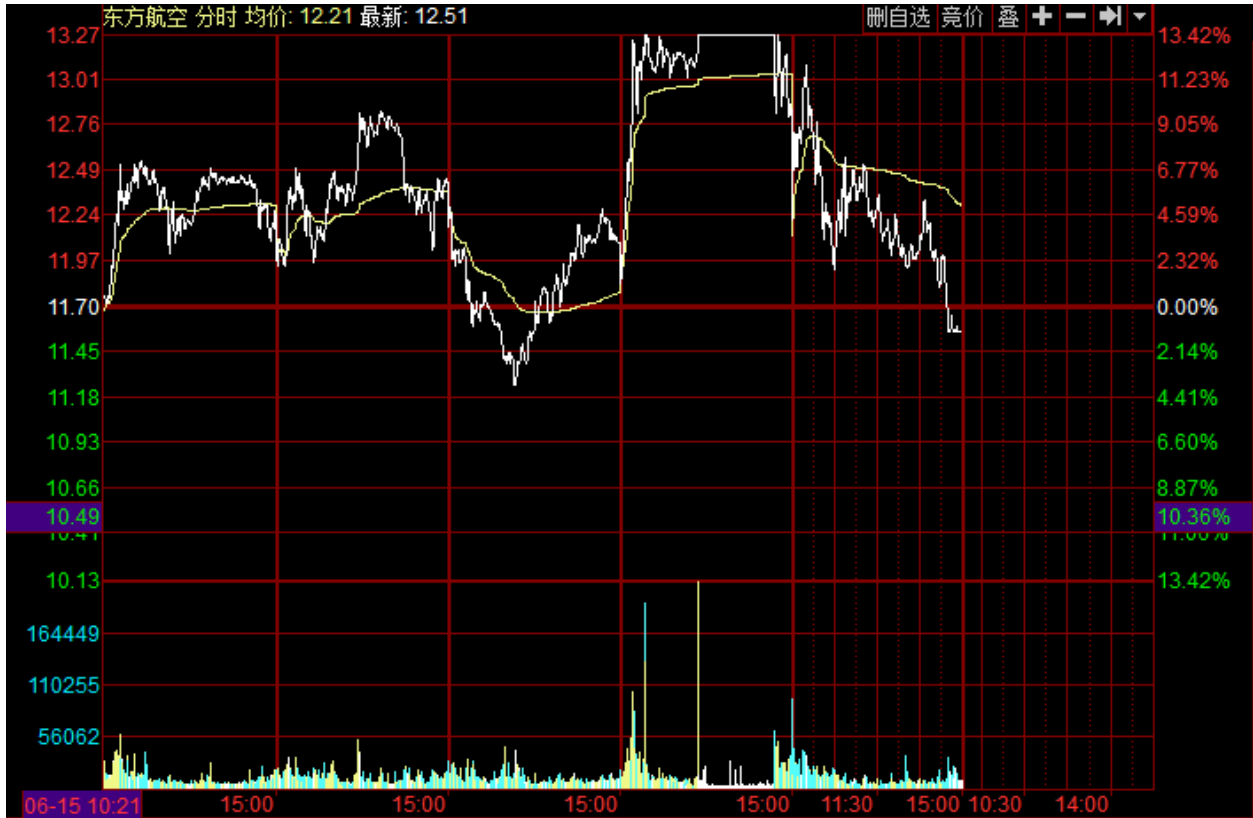


Figure 4. 3 CEA Stock Price over Week II

On Friday, the only stock the author still have in Portfolio I is SIA. Eventually the stock price was so low that 10% loss tolerance was almost reached. By that time, prices of all stocks the author chose showed decrease, as well as SSE Composite Index. All 2400 shares of SIA were sold at 32.00 RMB per share, generating a 6121.92 RMB loss.

### 4.3 Simulation Week III

Due to the national holiday on Monday, the SSE only opened to trading activities from Tuesday to Friday. In general, the SSE composite index increased 2 percent in the first two days



of this week. However, the market trend had a sharp turn on Thursday morning and eventually fell below its original value on Monday. On Monday, the opening index was 4471.61. By Friday, SSE Composite Index was 4192.87, which was only about 93.77 percent of its opening position on Monday morning. The rate of loss was 6.23% over this week. Due to the heavy in last week, the author was more careful about the entry point and exit time in this week. As a result, the author tried to use more financial tools such as EXPMA and MACD to help him to decide entering time and exit time as well. From the transactions in the week, the author got a total profit of -2033.52 RMB. The total asset in portfolio I declined to 103732.89 RMB. In comparison to last week's total asset, the author lost 1.92% of money. As summary, the performance of this week's trading was better than that of the market. Below Table 4.3 displays the transaction history of week III in portfolio I.

Date	Name	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total Profit
2015/6/23	CEA	Buy	12.44	4000	49,813.76		55,952.65	
2015/6/26	CEA	Sell	11.97	4000	47,780.24	-2,033.52	103,732.89	3,732.89
Total Asset								103,732.89

Table 4.3: Transaction History of Portfolio I for Week III

The CEA stock price showed rapid growth in the morning session on Tuesday Figure 4.8 shows the stock price of CEA over this week. Following the market trend, the stock price of

CEA reached 110% separately on Wednesday. The author entered the market at a rather late time and lost some initial profit of the rising trend on Tuesday morning. From Figure 4.4, the candlestick chart line went upward and crossed with 5-day EMA line, indicating a good time to buy in the stock on Tuesday. At the end of the day, 4000 shares of CEA stock were purchased at a price of 12.44 RMB per share. On Friday, the candlestick chart line went downward and broke



Figure 4. 4 EMA of CEA Stock Price over Week III

through 5-day EMA line again, giving the signal to sell. To confirm the result retrieved from EMA, MACD graph was also used by the author as analyzing tool in the decision process. Figure 4.5 is the MACD graph CEA stock price over past few days. From the graph, a bearish cross occurred on Friday, indicating the time to sell the stocks as well. Based on evidences collected from EXPMA and MACD, the author sold all of his stock holdings on CEA at a price of 11.97 RMB per share. The transaction generated a 2033.52 RMB loss, decreasing the total asset of Portfolio I to 103732.89 RMB.

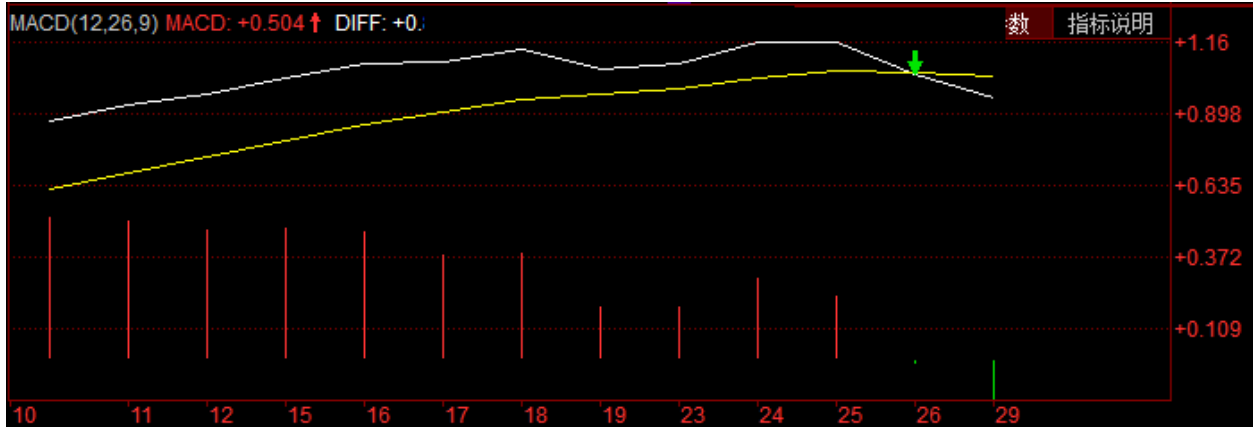


Figure 4. 5 MACD of CEA Stock Price over Week III

#### 4.4 Simulation Week IV

The stock market was still experiencing serious drop in its value through this weekend. On one day the volatility of the SSE Composite Index even surpassed 10 percent of its opening value of that day. On Monday and Thursday, the market went through clear downfall in its SSE Composite Index value. Throughout this week, the author only bought 8500 shares of PetroChina following the analysis of the MACD and EXPMA of the stock prices. The author entered at a price of 11.71 RMB per share; and by the end of Friday, the stock price was 11.83 RMB per share. As a result, the total asset of Portfolio I increased to 104,644.85 RMB, which was about 100.88% of its total asset at the end of last week. The growth in total asset was 0.88%, which was better than the negative 14.98% loss of the market. The author didn't take any actions toward other stocks such as CEA, SIA and CUTC. Because according to the MACD and EMA

graph readings of them at the moment, it was unwise to buy those stocks. Table 4.4 is the transaction history during the past week.

Date	Name	Buy / Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
2015/7/3	PetroChina	Buy	11.71	8500	99,643.04		4,089.85	
Total Asset								104,644.85

Table 4.4: Transaction history of Portfolio I over Week IV

The stock price of CEA had reached its daily lower price limit Wednesday, Thursday and Friday. Figure 4.6 and Figure 4.7 were EXPMA and MACD of the stock price of CEA over the past week. In the MACD chart, the MACD line continued to fall after the bearish crossing occurred on last Friday with no sign of bullish crossing in the rest of the week. To confirm the analysis from MACD, the author also checked with EMA chart. In the EMA chart, the candlestick line had fell below long term EMA line, driving the short term EMA to go downward. At this point, it was wise to enter short position on CEA stocks because such phenomenon indicated the end of bullish trend in CEA stock price. Moreover, such trends were also discovered in MACD charts and EMA charts of stock prices of SIA, CUTC and Changhong. In response to previous analysis results, the author didn't trade in any CEA, SIA, CUTC and Changhong stocks.

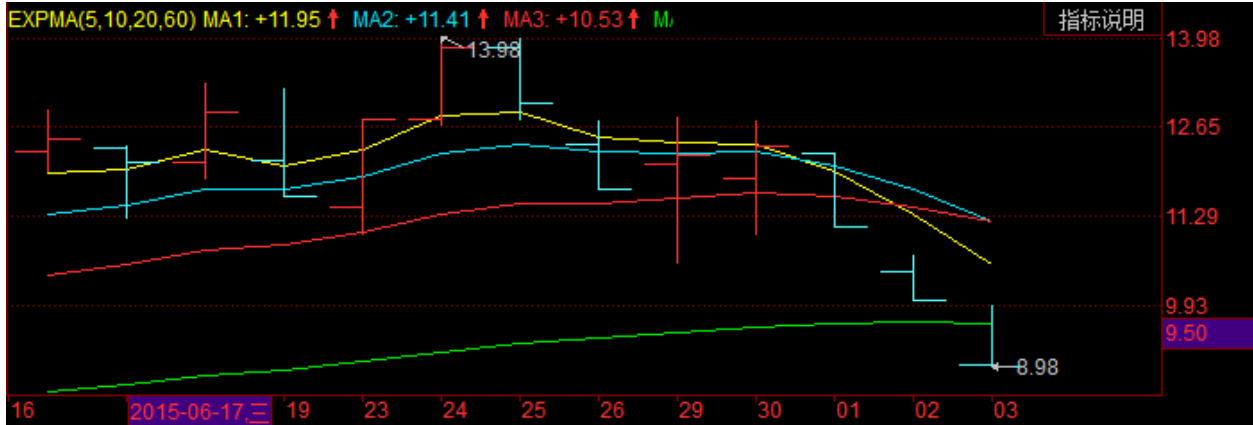


Figure 4. 6 EMA of CEA Stock Price over Week IV

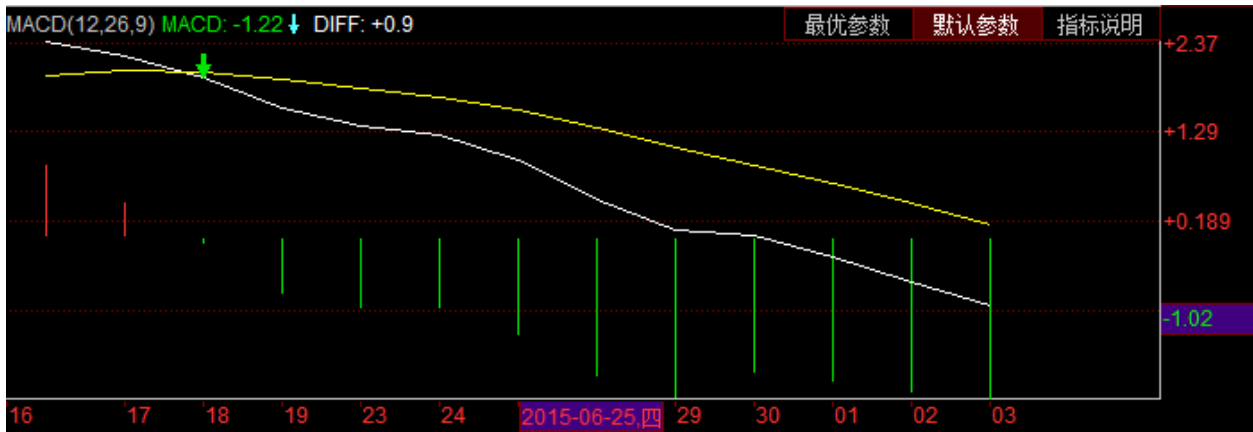


Figure 4. 7MACD of CEA Stock Price over Week IV

PetroChina was the only stock that managed to achieve an increase out of five stocks the trader selected. Large quantities of PetroChina stock was purchased in the market on Thursday afternoon, directly boosting the price from 10.20 RMB per share to 11.80 RMB per share. On the following Friday, the price oscillated a little and eventually ended up with the same price as the opening price. Figure 4.8 showed the stock price of PetroChina over the past week.



Figure 4. 8 Stock Price of PetroChina over Week IV

To determine the right time to buy the stock, the author used MACD and EXPMA to help him to determine the appropriate entering time. Figure 4.9 and Figure 4.10 showed the MACD and EXPMA graph of the stock price of PetroChina over the past weeks respectively.

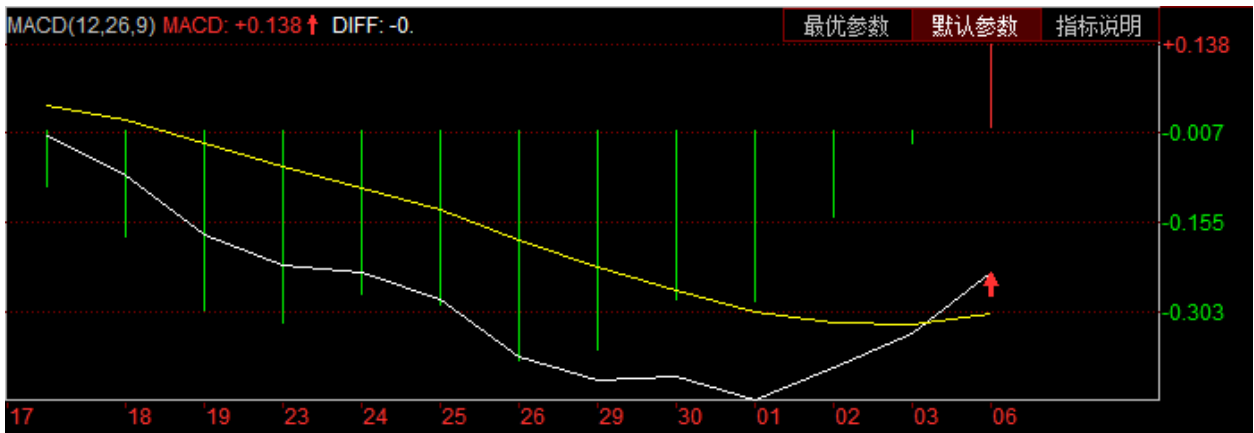


Figure 4. 9 MACD of PetroChina Stock Price over Week IV

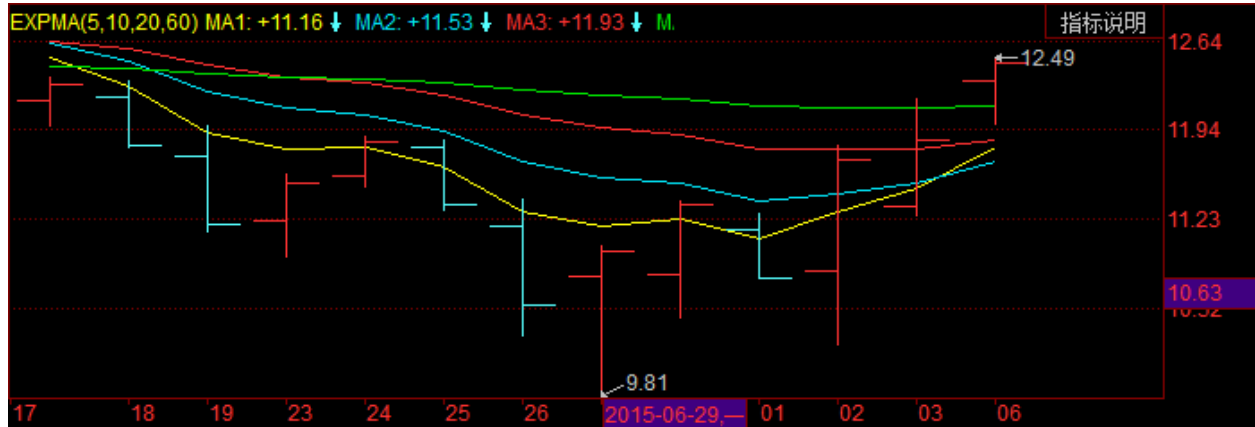


Figure 4. 10 EMA of PetroChina Stock Price over Week IV

On Thursday, the candlestick line overlapped the short term EMA and altered the direction of the short term EMA from downward to upward. On Friday, the short term EMA crossed 10 day EMA and kept going toward the long term EMA by the end of the trading day. The interpretation of such sign was that the stock price of PetroChina was converting its bearish trend into a bullish trend, and it was a proper time to enter long position on PetroChina. To be cautious, the author compared the results he got from EMA and the result he got from MACD. In MACD, the MACD line went through the signal line from below to above on 3 July, forming a bullish crossing. Also, the bar lines beneath the MACD were also changing the negativity into zero at the same time. According the results obtained from MACD, it could be confirmed that it was the time to buy in PetroChina stocks. As the result, the author entered the market at a price of 11.71 RMB per share. By the end of the trading day, the author held 8500 shares of PetroChina. The stock price rose to 11.83 RMB per share, raising the total asset of the Portfolio I to 104,644.85 RMB.

## 4.5 Simulation Week V

In this week, the market showed strong rebound on Thursday and Friday. Along with it, many stocks had rapid growth in their stock values on Thursday and Friday. The author sold his holdings on PetroChina and bought the stocks of CEA, SIA and Changhong on Friday. Some of these stocks even reached their daily upper price limit, which was 110 % of the opening price, within 30 minutes after the beginning of the trading day. In general, the market started on Monday with 3975.21 of SSE Composite Index and ended on Friday with 3877.80 of index. According to the two previous numbers, the market lost 97.41 of SSE Composite Index, which was about 2.51 percent of its opening value on Monday. Table 4.5 was the transaction record for Portfolio I over week V.

Date	Name	Buy / Sell	Price	Shares	NetCost/ Proceeds	Profit/ Loss	Total Cash	Total Profit (RMB)
2015/7/8	PetroChina	Sell	13.17	8500	111,712.61	12,069.57	115,802.46	15,802.46
2015/7/10	CEA	Buy	8.80	3400	29,953.32		85,849.14	
2015/7/10	SIA	Buy	28.58	1000	28,609.58		57,239.56	
2015/7/10	Changhong	Buy	6.95	4300	29,919.16		27,320.40	
Total Asset								117,743.40

Table 4.5 Transaction History for Portfolio I over Week V

In summary of this week's transaction, the author sold 8500 shares of PetroChina on Wednesday at price of 13.17 RMB per share and bought in 3400 shares of CEA, 1000 shares of



SIA and 4300 shares of Changhong on Friday. By the end of Friday, the estimated total asset of Portfolio I was about 117,743.40 RMB. Comparing it to that of last week's 104,644.85 RMB, through this week's trading the Portfolio I had a growth in its total asset by 12.52 %, which was better than the 2.51 % decrease of the market.

The stock Price of CEA reached its upper price limit on the last two continuous trading days. On Friday, its trading price almost reached the upper limit in less than one hour and remained at the same price for the rest of the day. Below are the figures of stock price, EMA and KDJ index of CEA stock value over past days.



Figure 4. 11 Stock Price of CEA over Week I

The KDJ index chart gave a signal to buy in on Thursday because the K value line and D value Line crossed while the K value line was rising. To confirm the result from the KDJ readings, the author checked the EMA chart. On the same day, the candlestick line didn't cross with short term EMA line yet, but showed a tendency of crossing instead. On Friday, the candlestick line finally overlapped with short term EMA, confirming the analysis result from KDJ reading. In the end, the author bought 3400 shares of CEA at a price of 8.80 RMB per share.



Figure 4. 12 EMA of CEA Stock Price over Week V

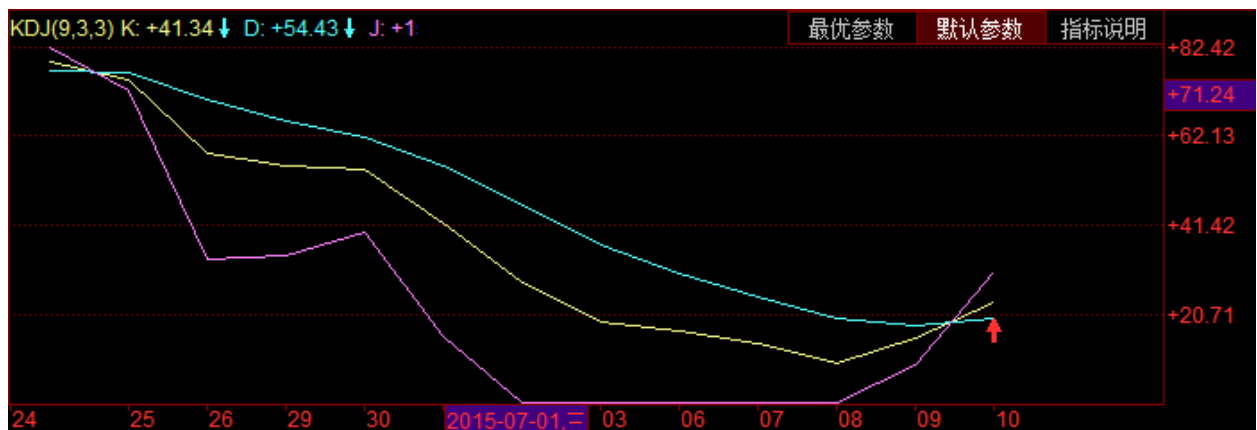


Figure 4. 13 KDJ Index of CEA Stock Price over Week V

Being Similar to the stock price of CEA, the stock price of SIA reached the daily price limit on Thursday and quickly on Friday after the open of the market on that day. Below are the price, EMA and KDJ index chart of SIA over past days. The EMA and KDJ index chart signaled the author to go in long position on SIA during this week; and as a result, the author bought in 1000 shares of SIA stock for 28.58 RMB a share. Similar actions were taken toward the stocks of Changhong since the author received analogical results from the EMA chart and KDJ index chart readings. In the end, the author purchased 4300 shares of Changhong at price of 6.95 RMB a share.

Unlike the values of four stocks before, the stock value of PetroChina increased on Monday and Tuesday instead of decreasing. During this week, the stock price of PetroChina reached its weekly highest price of 14.23 RMB per share, but the author regrettably missed the chance to sell at weekly high price. However, the author still managed to sell his holdings on Wednesday for a nice deal.

On Wednesday, the EMA chart firstly revealed a sign of selling when the candlestick price line crossed with short term EMA line from above. However, the KDJ index chart hadn't showed the same result yet. The K value line and D value line were showing tendency of converging but yet not overlapped. In the end, the author decided to trust the EMA reading more. So the author sold his 8500 shares of holding for 13.17 RMB per share. In the end, the profit from this single transaction alone was 12069.57 RMB, deducting all commissions and taxes. Below were Figure 4.14 and Figure 4.15, which were EMA chart and KDJ index chart of PetroChina stock price.

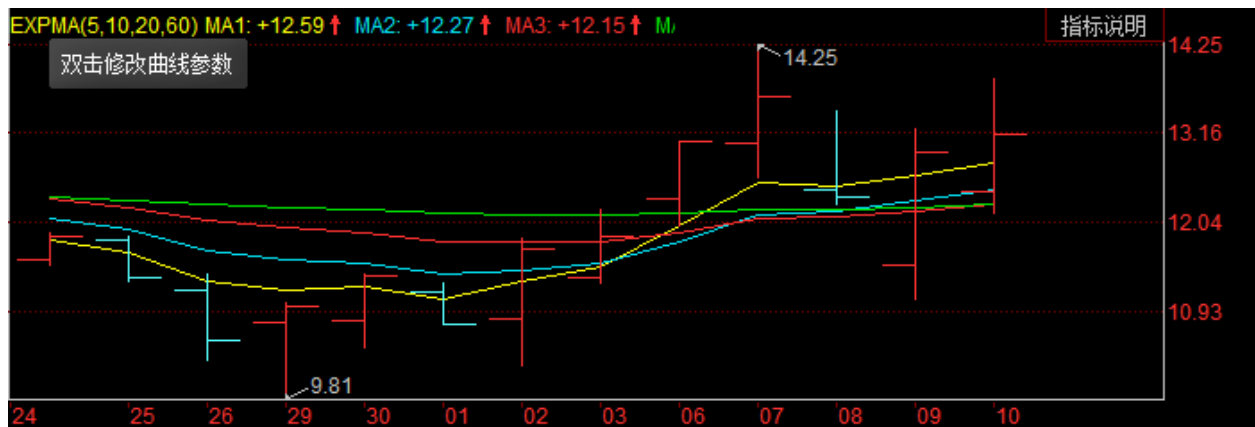


Figure 4. 14 EMA of PetroChina Stock Price over Week V

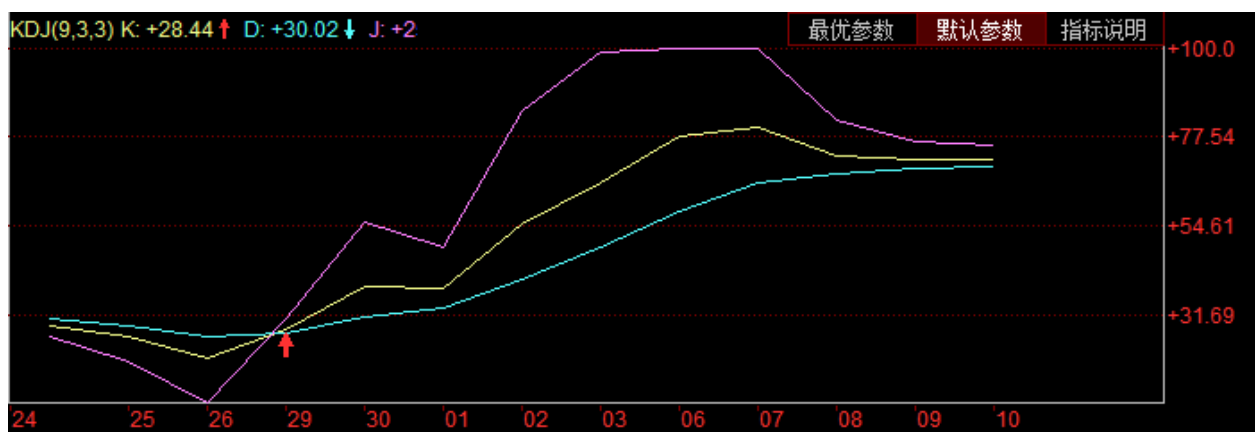


Figure 4. 15 KDJ Index of PetroChina Stock Price over Week V

## **5. Portfolio II: Buy-and-Hold Strategy Simulation**

The purpose of this simulation is to serve as a comparison for the simulation in chapter 4. In this simulation, the author will start with a portfolio with 100,000 RMB and execute long term trading strategy. The portfolio will be referred as “Portfolio II” in following text. The target stocks for trading activities will be the five stocks selected in Chapter 3; and the author will buy in those five stocks at an appropriate time and hold them until pattern of significant downward trend has shown up in the market. The term of the holding is usually weeks or even a month.

### **5.1 Simulation Week I**

During week I, the author was looking for a relative low price to enter the stock market. By the end of this week, the author held 1600 shares of Changhong, 600 shares of SIA, 1800 of shares of CEA, 800 shares of CUTC and 1500 shares of PetroChina. The Table 5.1 lists all transaction activity during this week. In week I, the SSE Composite Index had a growth of 2.42%, while the total asset of Portfolio II increased to 106,641.01 RMB by rough estimation. Among the 6641.01 RMB, almost half of it was contributed by the growth in Sichuan Changhong Electronics. The increase rate of total asset in this week was about around 6.64 percent, which was higher than the rate of the market. While four out of five stocks the author selected realized increase of value by the end of this week, the stock price of PetroChina went down by 0.04 RMB per share, according to the closing price on Friday.

Date	Symbol	Buy / Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
2015/6/8							100,000.00	
2015/6/8	CHANGHONG	Buy	11.72	1600	18,772.35		81,227.65	
2015/6/10	SIA	Buy	34.94	600	20,985.56		60,242.09	
2015/6/10	CEA	Buy	11.01	1800	19,839.62		40,402.47	
2015/6/10	CUTC	Buy	24.58	800	19,684.46		20,718.01	
2015/6/10	PetroChina	Buy	13.00	1500	19,521.00		1,197.01	
Total Asset								106,641.01

Table 5.1: Transaction in Portfolio II in week I

CEA was a stock that was having a strong upward trend since it already experienced reaching its daily price limit twice this week. Figure 5.1 showed the price of CEA over week I. By Friday afternoon, its market price was 11.70 RMB per share, while its opening price was only 10.01 RMB per share on Monday morning. It had an approximate total growth of 16.9 percent. When it's compared to total 2.42 percent progress by SSE Composite Index, the performance of CEA is far beyond that of the market.

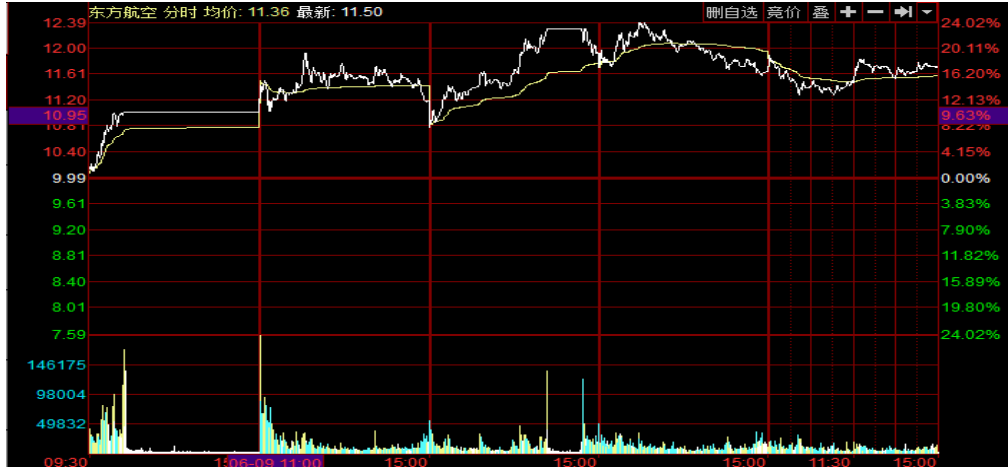


Figure 5. 1 CEA Stock Price over Week I

In the meanwhile, it was also meaningful to compare the performance with those of other stocks which were in the same industry. China South Airline Co., Limited and Air China Limited are another two major airline companies in Chinese aviation industry; the performances of these two stocks were reliable to evaluate the achievement of CEA within the aviation industry accurately. The net growth rates for the two companies over the past week were 15 percent and 5 percent, which were both below the rate of CEA stock price. In conclusion, CEA stock had stunning performance this week, surpassing the performance of the market and other companies in the same aviation industry.

Similar to the performance of CEA, SIA also revealed a strong upward trend for the past week. Below was Figure 5.2, showing the price trend of SIA in this week. The price increased from 32.85 RMB per share on Monday morning to 37.52 RMB per share on Friday afternoon. The rate of growth was around 14.2 percent, exceeding the 2.42 percent growth of the market.

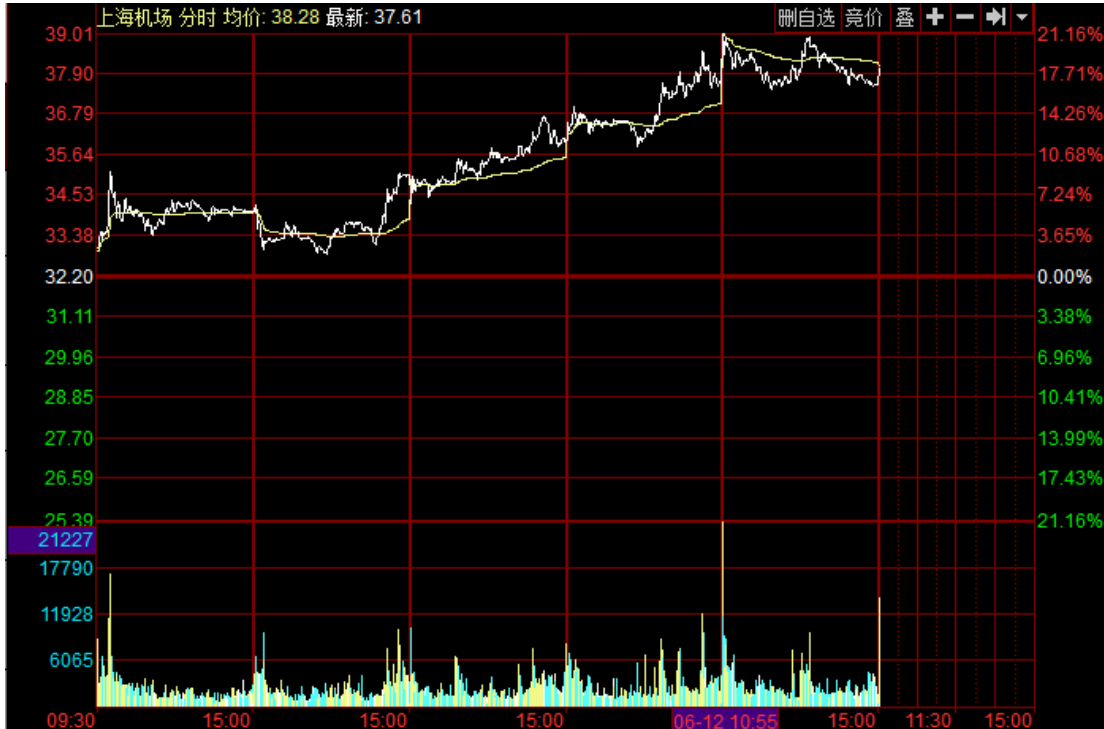


Figure 5. 2 Stock Price of SIA over Week I

The competitors of SIA, for example, included Guangzhou Baiyun Airport and Shenzhen International Airport. The rates of growth for stock prices these two were approximately 2.11 percent and 7.18 percent. Both of these two stocks had lower growth rate than that of SIA. In a short word, SIA stock had faster increase in its value than the general stock market and its competitors in the same business did.

The author bought in CUTC stock on Wednesday, at a relatively low price of 24.58 RMB per share. The stock price had an increase rate of 1.23 percent and 1500 RMB growth by Friday. Its rate was lower than that of the market during this week. Nonetheless, its rate was also lower than 7.49 percent of its major competitor: China International Travel Service Corporation Limited. To be short, the performance of CUTC stock was below the standard of its industry as



well as the general stock market. Below is figure 5.3., showing the price chart of CUTC over week I.



Figure 5. 3 Stock Price of CUTC over Week I

PetroChina was a rather stable stock comparing to other stocks the trader selected for the simulation. Figure 5.4 below showed this stable trend. Its stock price only had a growth rate of 1.49 percent over a week. However, due to the wrong point of entry, this stock failed to return profit by the end of the trading session of this week. Similarly, the stock price of its major competitor, SinoPec Group, only increased 1.28 percent over past five days. It was obvious that the Chinese petroleum industry was not performing as well as the other industries in the stock market. Even the SSE Composite Index had a higher increase rate. The author believed that it was very unlikely to see a huge growth in PetroChina in a short frame of time, probably not until

the international oil price significantly rises. Given the fact that PetroChina had low volatility in stock price, the author would not consider buy in this stock for short term trading in next week, but hold this one for a long term.

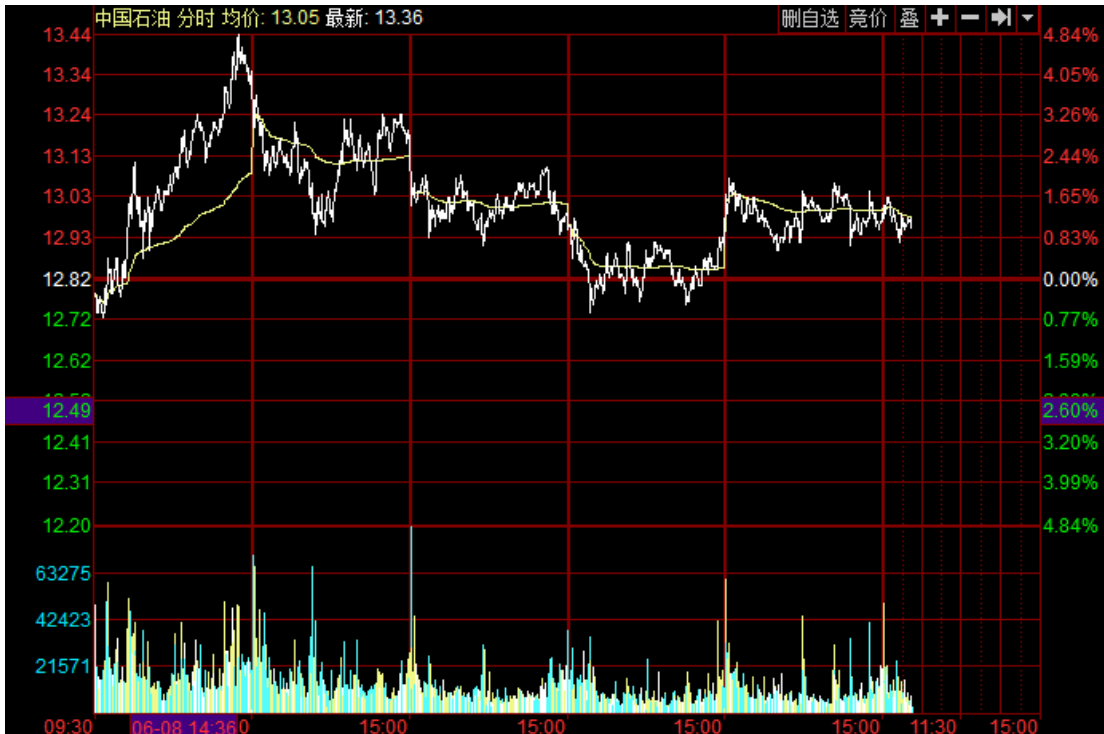


Figure 5. 4 Stock Price of PetroChina over Week I

## 5.2 Simulation Week II

During this week, the author dumped all his holdings on five stocks he selected because the clear downward trend emerged from the price chart of the stocks. The accumulated profit by end of this Friday was negative 1346.41 RMB. Because there was not any selling activity in last week, the net profit of week II equaled to the accumulated profit so far. By Friday, the total asset the author was holding declined to 98,653.59 RMB. The following Table 5.2 is the transaction history of week II.

Date	Symbol	Buy / Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
2015/6/17	PetroChina	Sell	12.00	1500	17,962.50	-1,558.50	19,175.78	-1,558.50
2015/6/17	CUTC	Sell	25.74	800	20,550.02	865.56	39,709.53	-692.94
2015/6/18	CUTC	Buy	27.00	1200	32,433.60		7,275.93	
2015/6/19	Changhong	Sell	13.35	1600	21,315.68	2,543.33	28,591.61	1,850.39
2015/6/19	CEA	Sell	11.95	1800	21,465.18	1,625.56	50,056.79	3,475.95
2015/6/19	SIA	Sell	32.60	600	19,568.18	-1,417.38	69,624.97	2,058.57
2015/6/19	CUTC	Sell	24.24	1200	29,028.62	-3,404.98	98,653.59	-1,346.41
Total Asset								98,653.59

Table 5.2: Transaction History of Portfolio II over week II

Starting from Wednesday, the author gradually sold out all his stock holdings in Portfolio II. For this abrupt downward trend appeared on Thursday and Friday, the author had to empty his holdings to avoid heavy loss. Because the author treated the downward trend on Thursday and Friday as minor oscillation, he was unable to enter the short position at ideal time. By the end of this week, the author got a total profit of -1346.41 RMB over a week. The total asset decreased from 106,641.01 RMB to 98,653.59 RMB, leaving a 7.49 percent deficit. In the meanwhile, the

SSE Composite Index lost 13.45 percent of its value in one week. In general, the performance of this week's transaction activities was better than that of the market.

CEA is one of the five stocks that didn't follow the market trend. Its stock price had a big swing on Wednesday and eventually had a decrease in its value at the end of the day while the SSE Composite Index experienced a slight increase. On Thursday when the index started to go downward direction, the stock price of CEA quickly reached its daily price limit and maintained at a high price level until the last few minutes. The figure below shows the price trend of CEA past weeks. The last five blocks are the stock price summary of CEA over week II.

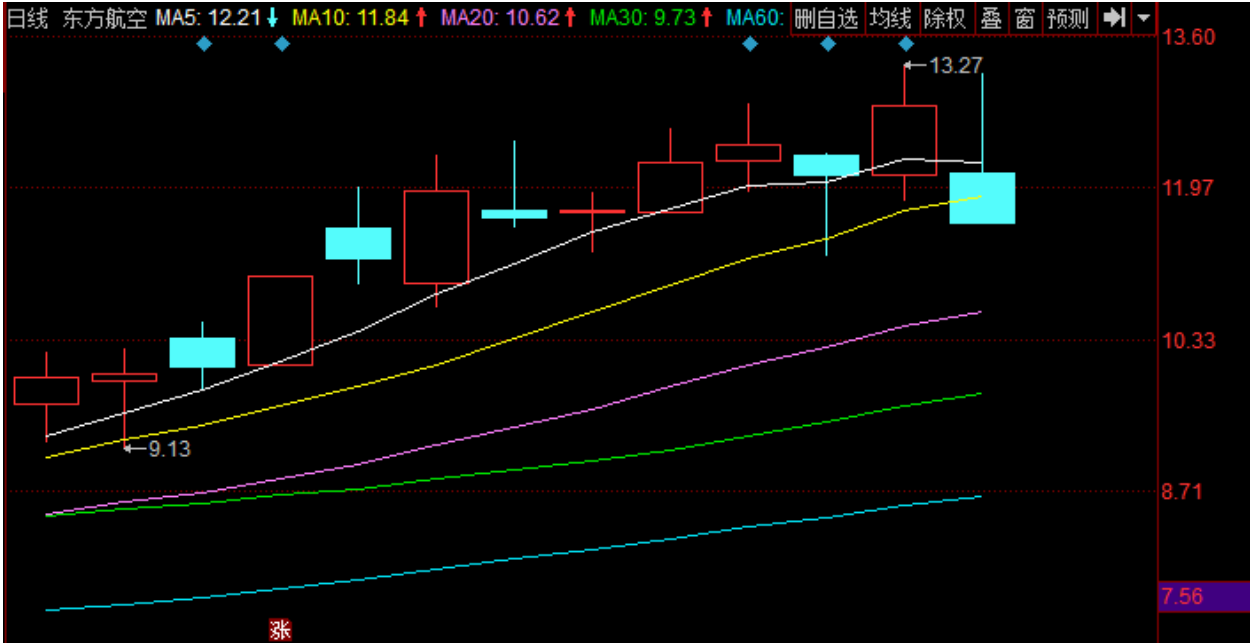


Figure 5. 5 Candlestick Chart of CEA Stock Price over Week II

In general, the stock price of CEA started with 11.66 RMB per share and ended up with 11.55 RMB per share. The rate of loss was about 0.94%, which was significantly smaller than the 13.45% rate of the stock market. However, one of its main competitors in aviation industry,

China South Airline Co. Limited, had a 10.5% overall increase in its stock price during week II. On the other hand, the other competitor, Air China Limited also experienced some decrease in its stock value. Its stock price shrank to 11.89 RMB per share, which is only about 91.75% of its value on Monday morning, and the loss rate is about 8.25%. In summary, the stock price of CEA had a better performance than the general market, but had an average performance among its competitors in aviation industry.

The stock price of SIA had a continuous fall from Tuesday to Friday, and its value decreased from 38.00 RMB per share to 31.95 RMB per share. Its loss rate in its stock value, which was about 15.92%, had already surpassed that of the market. However, the author believed it was only a regular price fluctuation and ignored the signal the market trend revealed. By the time the author realized that the stock price of SIA was actually experiencing a downward trend, it was already too late to make profits from selling them. The margin reduced from approximately 4000 RMB from last week to -1417.38 RMB by the time the trader sold them. The following figure shows the price of SIA over past Week.

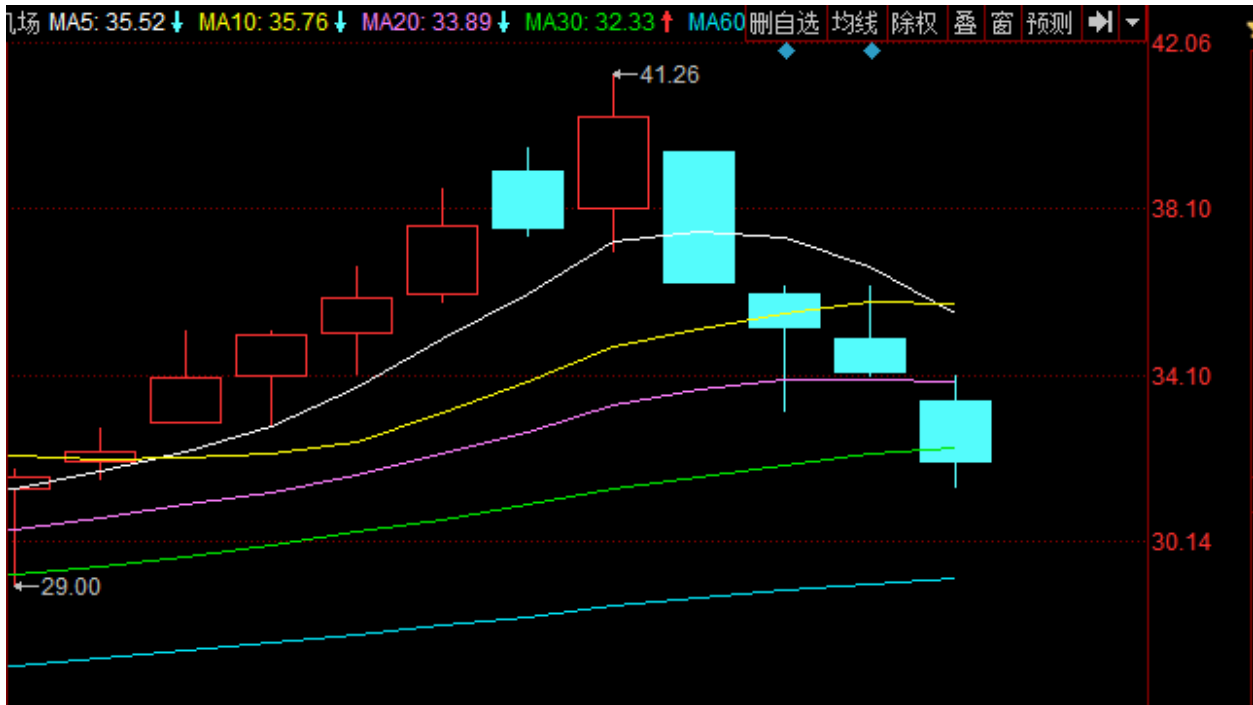


Figure 5. 6 Candlestick Chart of SIA Stock Price over Week II

Its major competitors, such as Guangzhou Baiyun Airport and Shenzhen International Airport both experienced a loss rate around 10% of its initial value from Monday. In a short word, the performance of SIA was worse than that of the general market and those of its major competitors.

The trend of the stock price of CUTC was very similar to that of the SSE Composite Index. It had slight bounce on Wednesday and steep downward trend on Thursday and Friday. By the time that market ended trading on Friday afternoon, stock price of CUTC was 23.59 RMB per share. The rate of decrease was about 11.15%. The figure below is the candlestick chart of the stock price over past weeks. The last five blocks represents the price summary over week II.

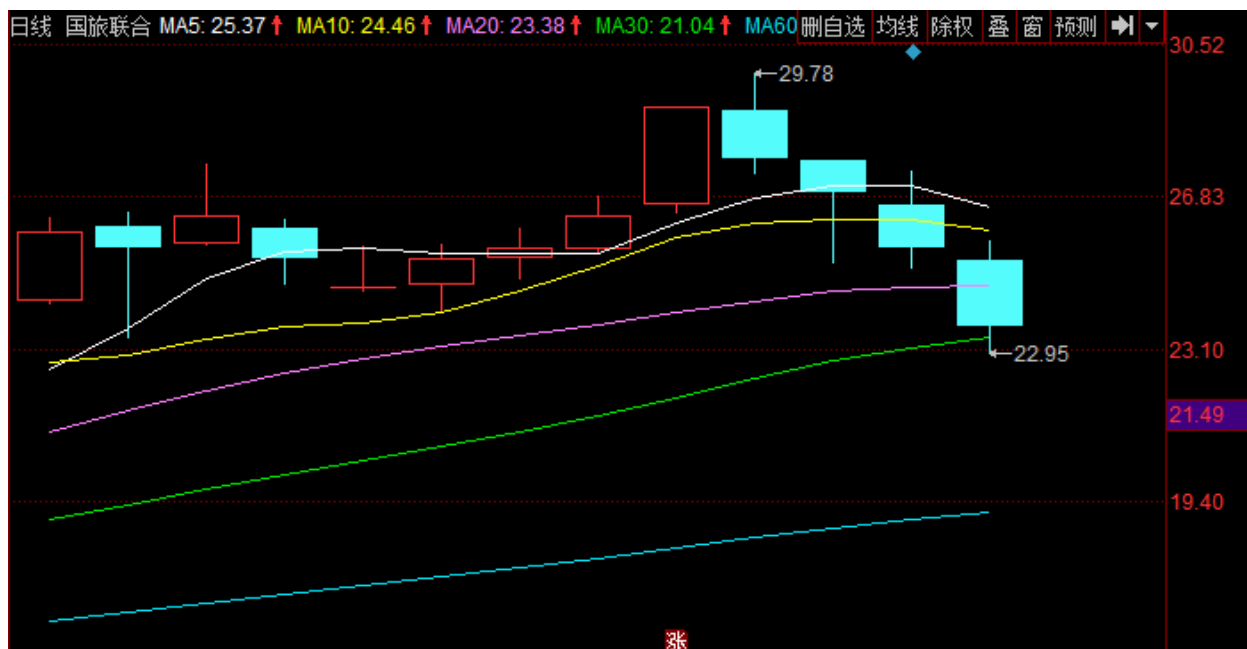


Figure 5. 7 Candlestick Chart of CUTC Stock Price over Week II

On Thursday, the author believed that the stock price of CUTC was already at its relative low point of the week, and it was a proper time point to enter long position. So he bought in 1200 shares of CUTC at 27.00 RMB per share. Yet, the price trend didn't start to rise again as the author hoped; instead, the price began to fall at an even faster pace on Friday. By the middle of Friday, the 10% loss tolerance had been reached and the author saw no trace evidence that the stock price will bounce back any time soon. So, 1200 shares of CUTC were sold at price of 24.24 RMB per share. Therefore 3404.98 RMB of loss was created. Its major competitor, China International Travel Service Corporation had a decrease rate of 13.35%. In general, the performance of CUTC stock price was slightly better than that of the market composite index and that of its major competitor.

Sichuan Changhong Electronics inherited its rising trend from last week and achieved further growth on Monday and Tuesday. The following is the stock price chart over past weeks. The stock price started with 13.20 RMB per share on Monday and closed with 12.43 RMB per share on Friday. The total loss rate over week II was only 5.83%, which was far lower than that of the market composite index. On Friday morning, given that the SSE composite Index was still falling at a fast rate and other stocks the author selected as reference also had decrease in its value in various degrees, the author resolved to collect his margin before it turned to be negative. As a result, all 1600 shares of Changhong were sold at 13.35 RMB per share; and the profit from this trade was 2543.33 RMB.

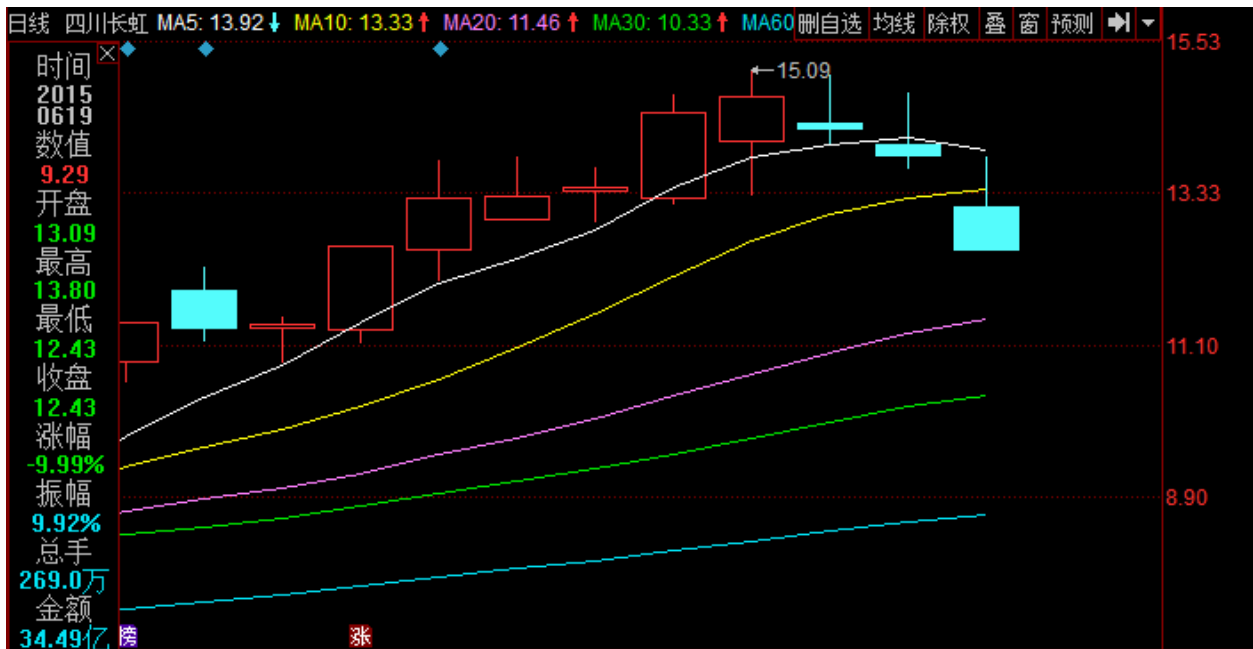


Figure 5. 8 Candlestick Chart of Changhong Stock Price over Week I I



PetroChina, as one of the stocks with worst performance, were sold by the author at 12.00 RMB per share on Wednesday. From chart below, it's clearly to see that the stock price reached its peak around two months ago and started to have oscillations until the end of week.

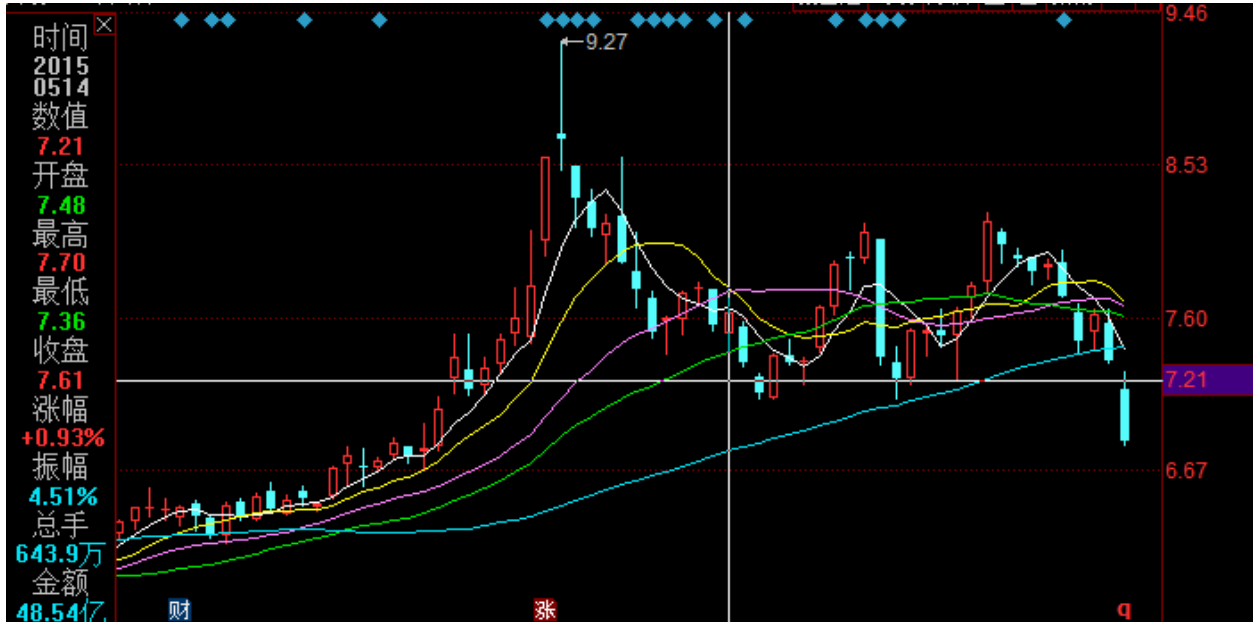


Figure 5. 9 Candlestick Chart of PetroChina Stock Price over Week II

In the end, the author sold all of 1500 shares of PetroChina because the shortage was around 1500 RMB according to the market price at that time. The loss was going for the 10% limit set by the author. To minimize the loss, the author sold all 1500 shares of PetroChina for 12 RMB per share. The stock price over this week lost 13.94% of its initial value before the market opened on Monday morning. In comparison to its biggest competitor, SinoPec, PetroChina had about 0.2% more decrease by percentage of loss in price. In a short word, the performance of PetroChina was very close to that of the market and that of its major competitor this week.

### **5.3 Simulation Week III**

Even though there was a very exciting upward trend in the early of week III, the author decided to wait first to see the further progression of the stock market trend before started to enter long position of certain stocks. As the author worried, many stocks reached its daily lower price limit during the fall of the price on Thursday and Friday. In the end, the author finished this week's simulation with no transaction activities because the author did not see any long term strong upward trend yet. The author decided to keep the money in his portfolio II until the right timing is present. The rate of growth in total asset was 0 %, which was still better than the loss in the SSE Composite Index.

In general, the stock price of CEA started with 11.40 RMB per share and ended up with 11.67 RMB per share. The rate of increase is about 2.36 %, which was significantly better than the 6.23% loss rate of the stock market. However, one of its main competitors in aviation industry, China South Airline Co. Limited, had a negative overall increase in its stock price during week III. On the other hand, the other competitor, Air China Limited also experienced increase, and the rate was about 18.24%. In summary, the stock price of CEA had a better performance than the general market, but had an average performance among its competitors in aviation industry.

The stock price of SIA had a similar trend with the market, and its value decreased from 32.00 RMB per share to 30.9 RMB per share. Its loss rate, which was about 3.44%, is smaller than that of the market. Its major competitors, such as Guangzhou Baiyun Airport suffered a 15%

heavy loss while Shenzhen International Airport experienced a loss rate around 2%. In a short word, the performance of SIA was worse than that of the general market and in a middle level among its business.

The trend of the stock price of CUTC was just a straight forward decreasing trend. By the time that market ended trading on Friday afternoon, its stock price was only 18.96 RMB per share, and the rate of loss was about 17.57%. Its major competitor, China International Travel Service Corporation had a decrease rate of 16.36%. In general, the loss rate of CUTC stock price was higher than that of the stock market but not as high as its competitor in the same business.

Sichuan Changhong Electronics only had a small increase on Tuesday, and then had continuous decrease in its stock price in the rest of the week. The stock price started with 11.98 RMB per share on Tuesday and closed with 10.18 RMB per share on Friday. The total loss rate over week II was 15.03%, which was more than twice of that of the SSE Composite Index. In a short word, the performance of this stock was significantly worse than that of the stock market in Week III

PetroChina basically followed the trend of the stock market. It achieved increase on the first two days and suffered loss during the last two days of this week. The stock price of PetroChina was 11.20 RMB per share on Tuesday as opening price and 10.53 RMB per share on Friday as closing price. PetroChina lost about 5.98% of its stock value over this week. In comparison to its biggest competitor, SinoPec, PetroChina lost about 2.49 % of its opening value on Tuesday. In a

short word, the loss rate of PetroChina was higher than that of the stock market and its major competitor in the same field over week III.

## **5.4 Simulation Week IV**

During the past week, the market had continuous declines in its value during the trading days. In general, the market was in a downward trend, as well as the stocks that author selected. Among the five stocks, only PetroChina achieved an increase in its stock price by the end of this week. Actually, it realized a 15% increase in its stock price in comparison to the negative 15% increase in SSE composite Index. However, most of the increase occurred on Friday, so the stock price of PetroChina couldn't be considered as an upward trend yet. By the end of this week, the author hadn't done any transaction in Portfolio II because the author believed that the market and the stocks he selected did not reveal upward trends in this week. The total asset at the end of the week remained unchanged, which was 98,653.59 RMB. In general, the increase rate in total asset in portfolio II was 0% for this week, which was still better than that of the market, which was negative 14.98%.

Among the five stocks the author had selected, CEA was one of the five that suffered the heaviest loss. Its stock price had fallen from 12.03 RMB per share on Monday morning to 8.98 RMB per share on Friday afternoon, and the loss rate in its stock price over this week was 25.35%, which was much higher than 14.98% of the market. In the same industry, South China Airline Co Limited experienced a similar downward trend as CEA. The percentage of decrease

in its stock price over this week was about 24.82%. In general, the performance of CEA was much worse than that of the market but within the same level in its own industry over this week.

SIA had an increase in its stock price in the first two days, a continuous downfall in the following three days and a little bounce on Friday. Its opening stock price on Monday morning session was 29.98 RMB per share, and the price dropped to 27.01 RMB per share on Friday afternoon, generating a 2.97 RMB price difference and 9.90% loss rate over week IV. Comparing to that of the market, the lost in the stock price of SIA was not as much as that of the SSE Composite Index. Same companies in same business such as Baiyun Airport and Shenzhen international Airport also took serious loss in their stock prices as well. Baiyun Airport lost 17.54% of its stock value in this week while Shenzhen International Airport suffered a 26.12% loss. In a short word, SIA had a better performance when its price trend was compared to that of the general market.

CUTC carried on its downward trend in its stock price from last week and continued to lose about 33.53% of its stock price over this week. Its stock price decreased from 18.70 RMB per share on Monday morning to 12.43 RMB per share on Friday afternoon. While the other major travel agency, China International Travel Service Corporation had a much smaller loss during the past week. The rate of decrease in its stock price was only 0.82%, which was significantly smaller than that of the general market and that of CUTC. In summary, the stock price of CUTC had a very poor performance when it's compared to that of the general market or that of its major competitor in the same business.

Just like the SSE Composite Index, the stock price of Sichuan Changhong Electronics had a little increase on Tuesday and soon it fell below its opening price from the morning session on Monday. The stock price on Monday morning was 10.22 RMB per share and it decreased to 7.74 RMB per share during the Friday afternoon session. It lost about 24.27% of its stock price in this week. In comparison to the trend of SSE market Index, the loss rate of stock price of Sichuan Changhong Electronics was higher than that of the market.

In contrast to other stocks and the general market trend, PetroChina actually achieved an increase in its stock price over the past week. The stock price began with 10.75 RMB per share in the Monday morning session and ended with 11.83 RMB per share in Friday afternoon session. When being compared to near 15% loss in SSE composite Index, a positive 9.13% increase in its stock price made PetroChina the stock with best performance among five stocks the author selected in this week. Its major competitor in the Petroleum industry, SinoPec, however, had a 0.59% decrease in its stock price over this week. In a short word, the stock price of PetroChina had a higher growth than that of the general market and its major competitor in the same industry.

## **5.5 Simulation Week V**

During past two week, the SSE market index fell from around 5100 points to near 3500 points, losing nearly 30 percent of its value. Recently, there was news about the government trying to financially rescue the Type A stock market. The obvious manifestation of the financial rescue actions was the increase in the stock price of large capital stocks such as PetroChina. As a

result, the SSE composite Index had a growth since this Tuesday. Assuming the government's financial rescue of the stock market would work, the stock price of the stocks should at least return to its long term average in the future. Based on this assumption, the author tried to buy in stocks when the growing trend appeared on Thursday and Friday. The table below is the transaction history for Portfolio II over Week V.

Date	Symbol	Buy / Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
2015/7/9	CEA	Buy	8.20	3600	29,553.12		69,100.47	
2015/7/9	SIA	Buy	25.34	1100	27,902.97		41,197.50	
2015/7/9	Changhong	Buy	6.03	4900	29,581.45		11,616.05	
Total Asset								110,994.05

Table 5.3: Transaction History for Portfolio II over Week V

In general, the author bought in 3600 shares of CEA, 1100 shares of SIA and 4900 shares of Changhong. According to the closing price of these three stocks on Friday afternoon, the total asset of Portfolio II had increased to 110,994.05 RMB. Moreover, the total asset from last week was 98,653.59 RMB, which was 12,340.46 RMB less from this week's. The growth in the value was about 12.51%. However, the increase rate in the market was negative 2.51 % making the performance of the Portfolio II trading better than that of the market. Unfortunately, this was the

last week of the simulation so that the author didn't have the opportunity to sell the stocks he held since Friday and prove how much actual profit he could produce from the transactions.

The stock price of CEA rose from 9.88 RMB per share to 9.95 RMB per share, according to the opening price on Monday and closing price on Friday; and the increase rate in its market value was 0.71 percent. The following figure showed the price of CEA over past weeks. Its competitor in the industry, South China Airline lost about 8.4 percent of its opening value since Monday morning session. In a short word, it could be concluded that the stock price of CEA had a better performance than the SSE Composite Index. The author wanted to buy this stock because he anticipated that with the rescue of the government, the stock market would grow in some degree, eventually approach long term average line, which is the green line in the following chart.

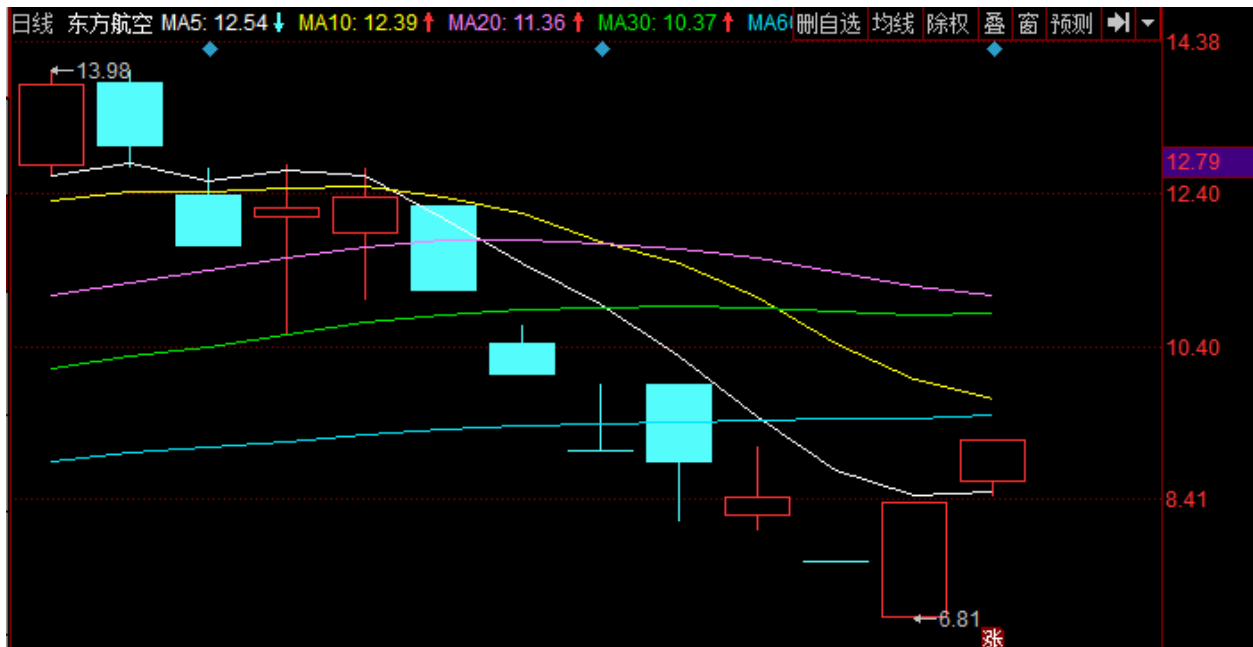


Figure 5. 10 Candlestick Chart of CEA Stock Price over Week V



The stock price of SIA decreased from 29.71 RMB per share to 29.05 RMB per share on a scale of one week. Figure 5.11 below was the stock price of SIA over past weeks. In summary, the performance of SIA stock over this week was slightly worse than that of the market. Based on same reason the author bought CEA stock, 1100 shares of SIA were purchased for 25.34 RMB per share.

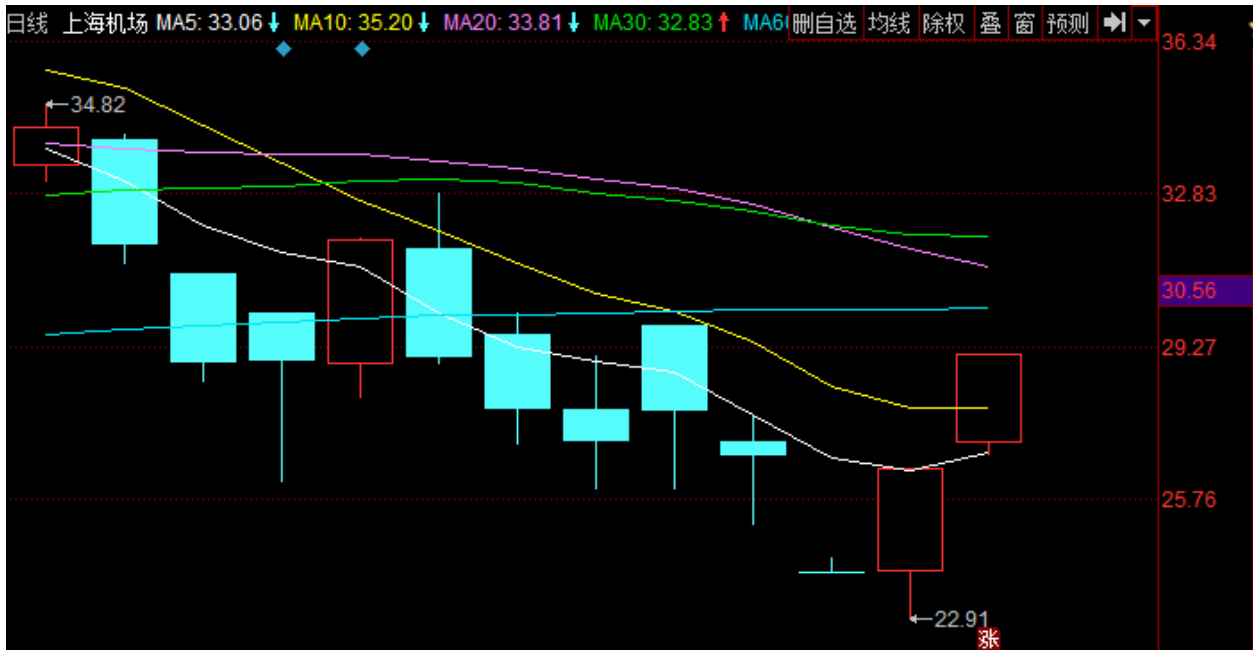


Figure 5. 11 Candlestick Chart of SIA Stock Price over Week V

Sichuan Changhong Electronics lost 1.48 RMB per share overall this week, and the lost rate was 17.39 %. Obviously, the stock price of Changhong had a hard fall this week. The figure below was the price of Changhong over past weeks. At that moment, the price was well below the green line, the long term average line. Therefore, the author believed that this stock was under priced at that time, and its value would return to long term average in the future. Finally, 4900 shares of Changhong were purchased at a price of 6.03 RMB per share.

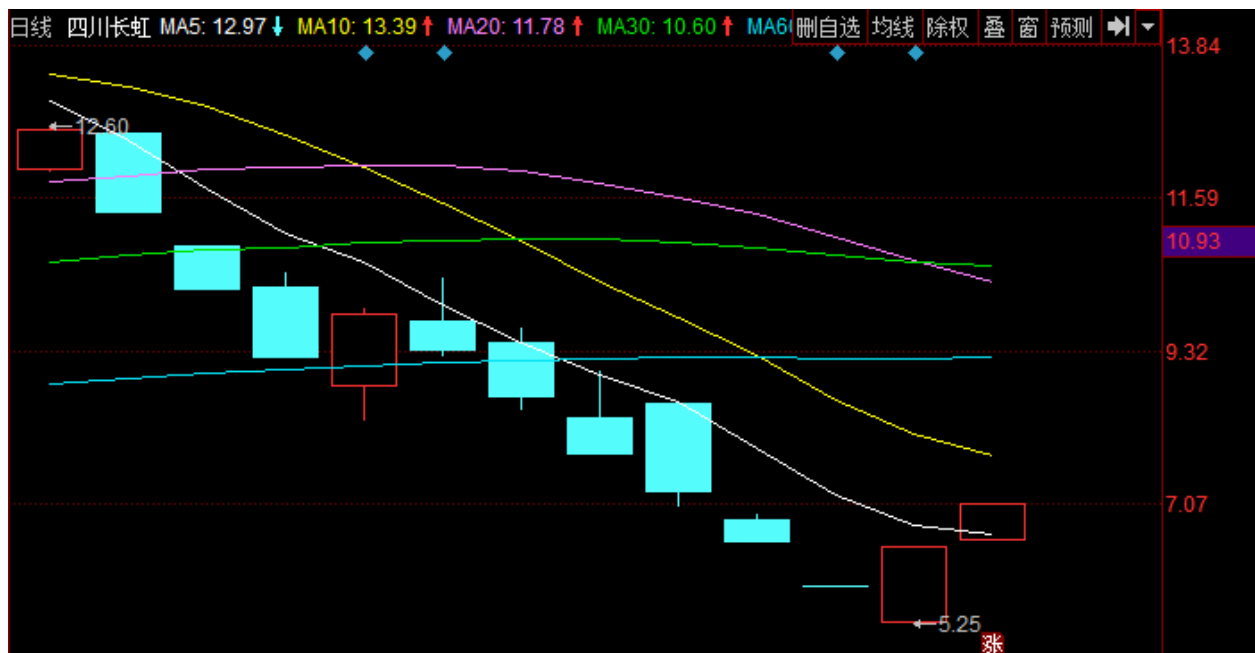


Figure 5. 12 Candlestick Chart of Changhong Stock Price over Week V

## 6. Comparison and Analysis

By the end of the five week simulation, Portfolio I created a total profit of 15,802.46 RMB and Portfolio II harvested a total profit of -1346.41 RMB. However, the total assets of the two Portfolios at the end of the five week simulation are 117,743.40 RMB and 110,994.05 RMB respectively. Table 6.1 is the summary of total asset of two portfolios.

Week	Portfolio I	Portfolio II	Difference
1	108,478.89	106,641.01	1,837.88
2	105,766.41	98,653.59	7,112.82
3	103,732.89	98,653.59	5,079.30
4	104,644.85	98,653.59	5,991.26
5	117,743.40	110,994.05	6,749.35

Table 6.1 Weekly Total Assets of Two Portfolios

The cause of this phenomenon was because that shortly after the start of the simulation, the general stock market experienced a major catastrophe, and the author had to sell all his holdings in Portfolio II and wait for the market to change the trend again. Luckily, because the financial rescue of the government, the market revealed the sign of changing at the last week. The author bought in the stocks in the last week using the money in Portfolio II, but the author didn't sell out the stocks again before the end of the simulation because the stocks were only purchased two days ago, and according to normal trend following trading technique, stocks shall

be held at least for a week. If the author sold those stocks, it would be swing trade instead of trend following, violating the principle trading method of Portfolio II.

In general, the swing trade strategy applied in Portfolio I yielded more profit when it was compared to the trend following strategy used in Portfolio II. Figure 6.1 below is the weekly total asset of the two Portfolios. It's obvious that the total asset of Portfolio I was always on the top of Portfolio II. However, this doesn't mean that swing trading is a superior strategy because shortly after the beginning of simulation, the Chinese stock market started to lose its value rapidly. The author didn't trade any stocks in Portfolio II during week 3 and week 4 because the market trend and price trends of the stocks were not ideal for trend following trading. The initial total asset gap in the first week was 1837.88 RMB, but soon it increased to 7112.82 RMB after the trading in second week because Portfolio II took a heavy loss by exiting the position too late. In next three weeks, the gap gradually increased from around 5000 RMB to 6749.35 RMB.

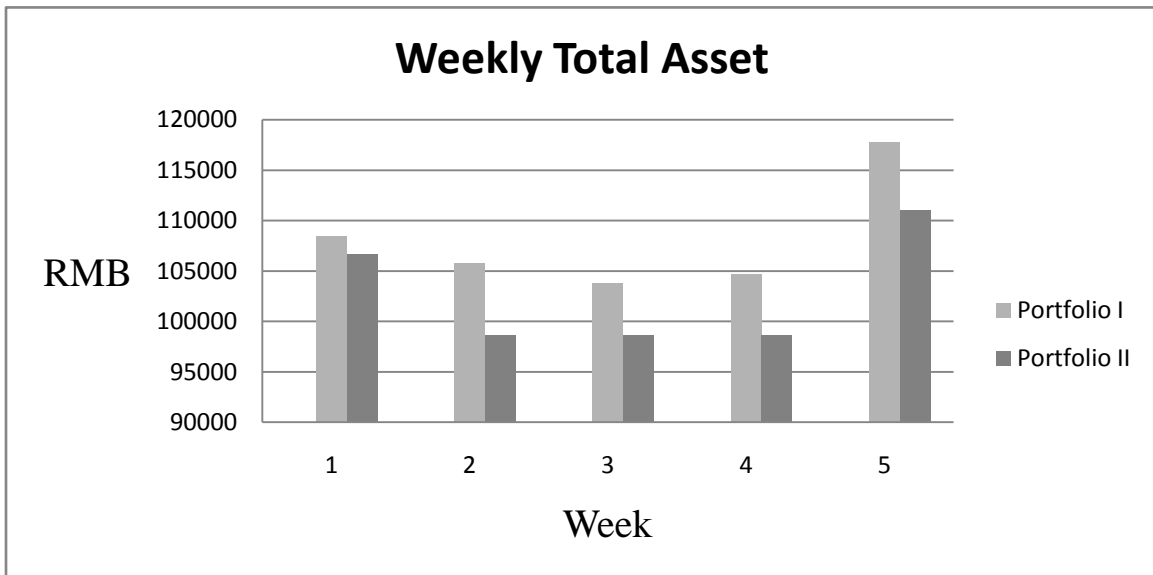


Figure 6. 1 Weekly Total Assets of Portfolio I and Portfolio II

It is also important to compare the performance of the two portfolios with the market. Figure 6.2 and Table 6.2 are the summary of increase/decrease rates of two portfolios in comparison to SSE Market Index. The rates for the portfolios are calculated by dividing the total asset by the end of each week with the initial capital in portfolio, which is 100,000.00 RMB. While the percentage of increase/ loss SSE market Index is calculated by dividing the closing index at the end of each week with the opening SSE market Index on Monday, June 8, 2015. From Figure 6.2, the increase/decrease rate of portfolios remained in a good position while the market was losing its values in week 2, 3 and 4. The total asset in Portfolio I even had an increase while the market was taking a heavy loss in week 4. The loss rate of SSE market index almost reached 27% during week 4, while the highest loss rate of the portfolios was only negative 1.35 percent. From this point, it can be concluded that it was wise to sell out all the stocks in week 2 to stop any further loss. In addition, the total asset of Portfolio I was never below the initial capital. By the end of simulation, the total asset increased 17.74%.

Week	Portfolio I	Portfolio II	SSE Market Index
1	8.48%	6.64%	2.39%
2	5.77%	-1.35%	-11.24%
3	3.73%	-1.35%	-16.90%
4	4.64%	-1.35%	-26.93%
5	17.74%	10.99%	-23.15%

Table 6.2 Summary of Increase/Decrease Rate of Two Portfolios and SSE Market Index

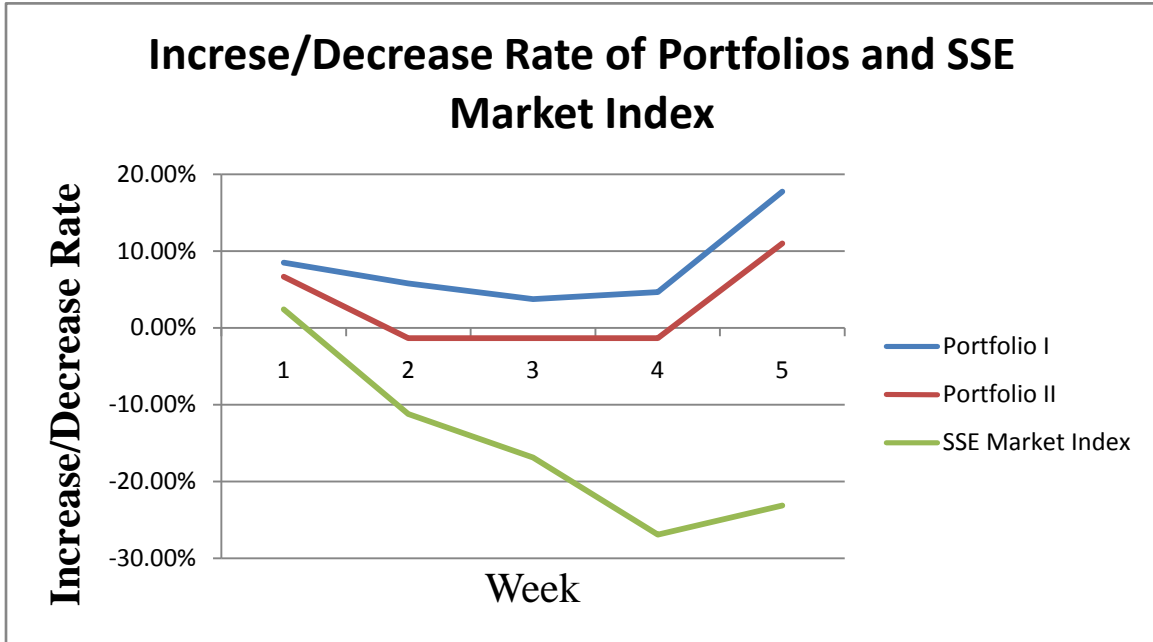


Figure 6. 2 Weekly Increase/Decrease of Portfolios and SSE Composite Index

In summary, the swing trade strategy applied in Portfolio I achieved superior performance than the trend following strategy used in Portfolio II. But it's inaccurate to say swing trading is a superior strategy because the simulation was only 5 week long, which was short period in the perspective of trend following strategy. Also, the market catastrophe was also a crucial effect that cannot be ignored. However, after five weeks of simulation, it can be concluded that between trend following trading and swing trade strategy, the latter one fits the author's characteristic and trading pattern more.

## 7. Conclusion

The team based the IQP on a five-week Chinese stock market simulation that ran over 2015 E terms. The simulation was based on two portfolios: short term trading portfolio and long term trading portfolio. The initial goal of this simulation was to be familiar with the Chinese stock market trading and reach a combined 5% profit rate for the two portfolios at the end of the simulation; and fortunately, the objective was achieved at the end of this project. Through the simulation, the team began to comprehend the Chinese stock market and some technical terms used in stock trading. With the knowledge acquired during the project, the team is confident at this point to operate stock trading activities independently in Chinese stock market. In addition, the two portfolios achieved over 5% total profit at the end of this simulation.

The team was very satisfied with the performance of Portfolio I, which that swing trade strategy was applied to. In the early stage of the simulation, the team didn't use any technique and tools to help decide which stock to buy or sell. As a result of that, Portfolio I experienced heavy loss when the general market started to crash. In week III, the team started to introduce tools such as MACD, EMA to help deciding selling or buying. In late stage of simulation, the team started using stochastic oscillator for the trading signal determination as well; and the reward of using analyzing tools for Portfolio I was very obvious. In week IV, the team bought in PetroChina according to the analysis from MACD and EMA of its stock price. By the end of the week IV, the total asset of Portfolio I realized an increase while the general market was having approximately 14% loss of the value. Basically the initial heavy loss for Portfolio I in the early

stage was due to the lack of usage of analyzing tools and trading based on unfounded guessing. However, after the analyzing tools were introduced, the situation was greatly improved.

On the other hand, the performance of Portfolio II was not as great as Portfolio I because of the market crash that began in the second week of simulation. The crash made long term trading difficult to yield profit because the stock prices were falling without any sign of bouncing back. Luckily, because of the policy and financial rescue action by the government, the stock market started to resurrect in week V. At the end of the last week, the total asset of Portfolio II achieved 10% plus growth. The regrettable fact was that the duration of simulation was too short for trend following trading, leaving the team unable to turn the growth in total asset in week V into actual profit.

From the comparison of the two portfolios, the team realized that swing trading strategy used in Portfolio I outperformed trend following strategy applied in Portfolio II. However, this fact doesn't indicate that trend following a less superior method. The team can only conclude that between the two techniques used in simulation, swing trading is more compatible with the team's trading style and characteristic.

In summary, the project was a very rewarding experience for the team. The team had a leap from knowing nothing about the stock market at the beginning to being able to make profit in simulation at the end. Moreover, the knowledge and trading techniques learned from this project will provide the team a starting guide to the real world stock market trading in the future.



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