

Analysis on the US and Chinese Stock Company

Yuhao Chen

Carnegie Mellon University, PA, 15232

**Corresponding author. Email: yuhaoc@andrew.cmu.edu*

ABSTRACT

This paper provides an analysis towards why Chinese stock market is different from US. It first provides an in-depth analysis in Chinese history of opening the financial market with four stages. Then, it examines the history of capital asset pricing models, and its effect on stock market. Then, author takes into account a case study that CGO, a novel strategy, works in US stock market and fails in Chinese stock market. The reason is that market structure is different and there is price limit policy imposed by the government.

Keywords: *CAPM, stock market, CGO*

1. INTRODUCTION

Researchers have created hundreds and thousands of financial model to predict stock return and earn profit. Markowitz (1952) published his theory of portfolio selection, his work inspired other researchers trying to figure out the relationship between risk and return so as to earn profit in the stock market. There are many famous models, including CAPM, APT, three factor models (Five factor models), and q-factor models, etc. Unfortunately, many strategies based on the models working well in the US stock market perform poorly in the Chinese stock market. In fact, the Chinese stock market is one of the most important financial markets outside the US. Since the Economic Reform and open up in 1978, China has changed its financial policy from closing the country and exceeding Japan to be the second largest economic entity in 2010. Thus, understanding what causing those famous theories which work well in the US stock market to fail in Chinese stock market can provide investors with useful advice. This paper examines the history of Chinese financial market for outside investment and specifically examines the failure of capital gain overhang theory. It provides in-depth analysis on several possible reasons contributing this huge differences in model performance. Besides, possible solutions to mitigate those issues are mentioned above. Knowing the reason that those fantastic models fail, those ineffective models are able to be adjusted so they can better fit the Chinese stock market.

2. ANALYSIS

2.1. Background

With the covid-19 global pandemic, this year's Federal rate cut indicates that the world is entering a post-crisis era. This is an era of "Japanese recession" with low inflation, low interest rates, and low growth, with easing liquidity, rising stock markets, volatility, and downward pressure on bonds. By contrast, the interest rate level of China's bond market will become very attractive, and this year will be the "big year" for foreign capital to enter China's financial market, especially the Chinese stock market. Since July this year, as the domestic A-share market has become hot, overseas funds entering A-shares through the Shanghai-Shenzhen-Hong Kong Stock Connect channel have rapidly increased. According to data, from July 1 to 13, the net increase in A-share holdings by Northbound funds reached 65.367 billion yuan, which has exceeded the peak monthly net inflow this year. Although there has been a certain amount of net outflow of northbound funds in recent trading days, industry experts believe that the long-term trend of foreign capital inflows into the A-share market should not be interrupted. It is expected that there will be an increase of 100 billion yuan in the second half of the year. Funds flowed into A shares.

2.2. The Historical Process of Chinese Utilization of Foreign Capital

Over the past 40 years of reform and opening up, China has continuously expanded the scale and quality

of foreign capital utilization, and has achieved world-renowned achievements. By the end of 2018, China had established a total of about 960,000 foreign-invested enterprises, and the accumulated actual use of foreign capital exceeded US\$2.1 trillion. According to statistics from the United Nations Conference on Trade and Development, since 1992, the country's actual use of foreign capital has ranked first among developing countries for 27 consecutive years. In 2018, the actual use of foreign capital reached 134.97 billion U.S. dollars (excluding banking, securities, and insurance data), ranking second in the world, about 12 times that in 1992 and 150 times that in 1983. In 2018, the actual use of foreign capital in the service industry and manufacturing industry accounted for 68.1% and 30.5% respectively. Since 1998, the actual use of foreign capital in high-tech industries has increased by 16 times, accounting for 23.5% in 2018. Multinational companies have invested in more than 2,000 regional headquarters and R&D centers in China.[1]The historical process of China's utilization of foreign capital in the past 40 years of reform and opening up can be roughly divided into four stages.

2.2.1. The first stage

The first stage is the pilot exploration stage from 1978 to 1991. This stage was marked by the historic decision to implement reform and opening up at the Third Plenary Session of the Eleventh Central Committee. Through the trial of special economic zones such as Shenzhen, China has vigorously attracted foreign investment to develop labor-intensive export processing industries. In 1984, Comrade Deng Xiaoping inspected the south. China further opened up 14 coastal open cities and established national economic and technological development zones, which initially formed an open pattern of points and lines, lines and areas. In 1986, the State Council promulgated the "Regulations on Encouraging Foreign Investment", which put forward a series of policies and measures to encourage foreign investment in taxation, credit, import and export, etc. At this stage, China's utilization of foreign capital began to take off, and it continued to expand pilot projects in the course of exploration. The average annual actual use of foreign capital was US\$1.79 billion. In 1991, the actual use of foreign capital reached US\$4.37 billion.[1]

2.2.2. The second stage

The second stage is the rapid development stage from 1992 to 2000. This stage was marked by Comrade Deng Xiaoping's southern speech in 1992 and the decision to establish a socialist market economy at the 14th National Congress of the Party. The field of foreign investment has expanded from export processing industries to high-tech industries, from

manufacturing to service industries, and the scope of opening to the outside world has expanded from coastal areas to rivers, inland, and borders, forming a comprehensive, multi-level, and wide-ranging opening-up pattern. In 1998, the Central Committee of the Communist Party of China and the State Council issued the "Opinions on Further Expanding Opening-up and Improving the Level of Utilization of Foreign Capital", which comprehensively explained the importance of the utilization of foreign capital in opening-up. The guiding ideology of sustained, rapid and healthy economic development and overall social progress. At this stage, China's utilization of foreign capital has developed rapidly, with an average annual actual use of foreign investment of nearly 36 billion U.S. dollars. In 2000, the actual use of foreign capital reached 40.72 billion U.S.[1]

2.2.3. The third stage

The third stage is the high-level opening stage from 2001 to 2011. This stage was marked by accession to the World Trade Organization in 2001, and it changed from a unilateral independent opening to a mutual opening with WTO members under international rules. Joining the WTO has opened a new era in which China will fully participate in economic globalization and make full use of two markets and two resources. In 2010, the State Council issued the "Several Opinions on Further Doing a Good Job in the Utilization of Foreign Capital," which proposed to "create a more open and optimized investment environment and comprehensively improve the level of foreign capital utilization." At this stage, China actively fulfilled its WTO commitments and further opened up to the outside world. Utilizing foreign capital paid more attention to promoting industrial optimization and upgrading and regional coordinated development. The average annual actual use of foreign capital was US\$80.32 billion. In 2011, the actual use of foreign capital reached US\$123.99 billion.[1]

2.2.4. The fourth stage

The fourth stage is the fully open stage since 2012. This stage is marked by the promotion of a new pattern of comprehensive opening up and the implementation of pre-access national treatment plus a negative list management system for foreign investment. The 18th National Congress of the Communist Party of China proposed that to adapt to the new situation of economic globalization, a more proactive opening strategy must be implemented. In November 2013, the Third Plenary Session of the Eighteenth Central Committee of the Communist Party of China proposed to explore the management model of pre-access national treatment plus a negative list for foreign investment, unify domestic and foreign laws and regulations, accelerate

the signing of investment agreements, and reform the foreign investment approval system. Reform tasks such as relaxing investment access, building the Shanghai Pilot Free Trade Zone, and expanding inland and border openings have clarified the top-level design for the use of foreign capital in the new era. In May 2015, the Central Committee of the Communist Party of China and the State Council issued the "Several Opinions on Building a New System for an Open Economy", which made comprehensive arrangements for the innovation of foreign investment management systems.

3. MODEL AND THEORY

Before the introduction of Capital Asset Pricing Model (CAPM), there was no established relationship between risk and cost of capital, thus making it hard to predict the earnings of a business entity. Modigliani and Miller (1958) came up with their Modigliani–Miller theorem (capital structure irrelevance principle) and formed a basis for modern knowledge of a company's capital structure[2]. In the following years, Treynor (1962)[3], Sharpe (1964)[4], Lintner (1965a,b)[5][6], and Mossin (1966)[7] developed the capital asset pricing model (CAPM) to explain the relationship between the expected rate of return and the risk of capital assets. Although Lintner and Sharpe believed that former's model was more suitable in real world, Fama (1968) pointed out that their models were almost the same. Stone (1970) also confirmed that the Mossin's model were same as the other three models[8]. French (2003) examined the four models in several perspectives, including assumptions, model type, requirements, conclusions and exposition method, further affirming that the consistency of the four CAPM models[9]. Black et al. (1972) noticed that the original CAPM models was flawed: the alpha value was not equal to 0 as expected and was inversely related to the value of beta, coming up with the Black CAPM (zero-beta CAPM) which fits the real world data better[10].

Besides those factor model, researchers try to combine behavioral finance into stock return analysis. Daniel Kahneman and Amos Tversky proposed prospect theory which combines the research methodology of psychology and economics. The theory enable analysis of human judgment and decision-making under uncertain conditions. Aiming at the long-used rational person hypothesis, this theory negates the long-standing assumption in economics that people act rationally and evaluate the factors contribute to people irrational behavior from their behavioral and psychological characteristics.

Many scholars study decision-making under risk and uncertainty conditions, and they have put forward many models. The most commonly accepted rational choice model is the expected utility theory of wealth, which provides mathematical axioms and is more

convenient to apply. But researchers notice that the theory was flawed in many aspects in recent years due to its inability to explain many anomalies. Also, experimental data violates many of its core principles. Thus, researchers have create new model which better fit the financial market. Capital gain overhang is the first theory which enables an exhaustive measure of disposition effect. Frazzini (2006) infers from prospect theory that humans' risk aversion nature create disposition effect: when people sell and then create the capital gain overhang (CGO) theory which states that CGO is related to positive stock return. [12] Grinblatt and Han (2015) confirm that in Us stock market, CGO is positively correlated to the stock return: Disposition effect increases the difference between stock price and company value. [13]Although CGO works in US market, some scholars notice that CGO fails in Chinese stock market. Using portfolio sort test, they notices that the CGO is negatively correlated to stock return, which contradicts the original theory. This is not the first time theories that work in US market does not work in Chinese stock market. Even though some believe that the people quickly adopt this theory and the pricing error is eliminated in the market, the main reason should be a completely different market structure between the US and China.

4. THE FAILURE OF CAPITAL GAIN OVERHANG IN CHINESE STOCK MARKET

4.1. Market Structure

Market structure has determined effect for CGO in Chinese stock market. The investment subjects are different. Institutional investors such as US investors' main pension funds and hedge funds account for more than 80%, while China's institutional investors account for about 10%-15%. As professional investors, institutions have the same information acquisition capabilities and maturity of investment concepts as personal investment. There are huge differences between the people, and their views on the problem are more systematic and scientific. The decomposition difference cause different turnover rate in those two market. In U.S. stocks, there are mostly institutional investors, with a low turnover rate and an average holding period of more than one year. In the one-year holding period, when the stock price gradually rises, investors are gradually in a state of floating profit, and the disposal effect makes people continue to sell stocks, causing the price of floating shares to be suppressed, and future yields will be higher. In contrast to A-shares, the average holding period of investors in the A-share market is less than one month, which is one-tenth that of US stocks, that is, the turnover rate is 10 times that of US stocks. This more frequent trading enable over-react

dominant instead of under-react, impairing the CGO theory.

4.2. The Price Limit Policy

The price limit policy imposed in Chinese stock market also impact the CGO. Since April 1998, the China Securities Regulatory Commission has imposed special treatment on the stocks of some listed companies, namely ST, with a limit of 5% for stocks. The calculation formula is that the closing price of the previous trading day $\times (1 \pm 5\%)$ and the calculation method is the same as above. In addition, for PT stocks, the increase is limited to 5%, and there is no limit on the decrease. As the name implies, the price limit sets up a daily limit and a limit, and the daily price must fluctuate between the limit. Besides, the price limit provides a cooling-off period, giving investors time to rationally re-estimate the future price.

Firstly, according to volatility overflow hypothesis, the price limit will cause the volatility to spread for a long period of time after the price limit, that is, the fluctuation of at least a few trading days after the price limit, instead of reducing it. The increase is led by stock market's inability to correct order imbalances because the price limit prevents large intra-day price fluctuations. The volatility spillover hypothesis is empirically supported by Kyle (1988).[14]

Secondly, the delay in price discovery is another costly issue caused by price limits. Transaction and order will not take place after the stock fluctuation reach the limit. After imposing constraints on the movement of the futures price, the future contract may not be able to reach its equilibrium price on the day of the price limit, and the price discovery will be delayed. Grundy and McNichols (1989) concludes that only through transactions can information be revealed and transmitted. [15] Because the price have to wait until next trading day to start converge to its real value, the delay of change hinder the transmission of the information.

Besides the difference in market structure, there are other possible explanations for the failure of CGO. Some researchers mentions that turnover data is unreliable for Chinese company with a lot of companies fake transactions.

5. CONCLUSION

This paper examines the development of asset pricing models and several reason why it fails in Chinese stock market. Although as the second largest economic entity in the planet, the country has an entirely different market structure from the US financial market, including different investor composition, price limit.

ACKNOWLEDGMENT

I would like to express my special thanks of gratitude to my Professor Parakhonyak from Oxford University as well as my teacher Yin and Sun who gave me the advice.

REFERENCES

- [1] China Foreign Direct Investment Data. Trading Economics.
<https://tradingeconomics.com/china/foreign-direct-investment>.
- [2] Modigliani, F. and Miller, M. H. The Cost of Capital, Corporation Finance, and the Theory of Investment. *The American Economic Review* 48, 1958, pp. 261–297.
- [3] Treynor, J. L. Toward a Theory of Market Value of Risky Assets. Unpublished manuscript. "Rough Draft" dated by Mr. Treynor to the fall of 1962. A final version was published in 1999, in *Asset Pricing and Portfolio Performance*. Robert A. Korajczyk (editor) London: Risk Books, 1962, pp. 15–22.
- [4] Sharpe, W. F. Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk." *The Journal of Finance* 19(3), 1964, pp. 425–442.
- [5] Lintner, J. The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *The Review of Economics and Statistics* 47, 1965, pp. 13–37.
- [6] Lintner, J. Securities Prices, Risk, and Maximal Gains from Diversification. *The Journal of Finance* 20(4), 1965, 587–615.
- [7] Mossin, J. Equilibrium in a Capital Asset Market. *Econometrica* 34(4), 1966, 768–783.
- [8] Stone, B. K. Risk, Return, and Equilibrium; A General Single-Period Theory of Asset Selection and Capital-Market Equilibrium. Cambridge: MIT Press. 1970
- [9] Fama, E. F. The Capital Asset Pricing Model: Theory and Evidence. *Journal of Economic Perspectives*, Volume 18, Number 3, Summer 2004, 2003, pp. 25–46
- [10] Black, F. Capital Market Equilibrium with Restricted Borrowing. *The Journal of Business* 45(3), 1972, 444–455.
- [11] Andrea Frazzini, Lasse Heje Pedersen, Betting against beta. *Journal of Financial Economics*, Volume 111, Issue 1, 2014, Pages 1-25

- [12] FRAZZINI, A. The Disposition Effect and Underreaction to News. *The Journal of Finance*, 2006,(61): 2017-2046. doi:10.1111/j.1540-6261.2006.00896.x
- [13] Grinblatt, Mark. Prospect Theory, Mental Accounting, and Momentum. *Journal of Financial Economics*. 2004, (78) 311-339. 10.1016/j.jfineco.2004.10.006.
- [14] Kyle, R.A. Prognostic factors in multiple myeloma. *Hematol. Oncol*, 1988, (6): 125-130.doi:10.1002/hon.2900060212
- [15] ruce D. Grundy, Maureen McNichols, Trade and the Revelation of Information through Prices and Direct Disclosure, *The Review of Financial Studies*, Volume 2, Issue 4, October 1989, Pages 495–526, <https://doi.org/10.1093/rfs/2.4.495>