

The Puzzle of Stock Premium in Western Market and Its Enlightenment to Chinese Market

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Abstract: The mystery of stock premium has been a curious issue for nearly a hundred years. This study discusses the origin of the puzzle of stock premium, the progress of western research and Its Enlightenment to China's capital market. The mystery of stock premium comes from Mehra and Prescott's research in 1985, which refers to the phenomenon that the real return of stocks is much higher than the risk-free interest rate, which is difficult to explain by the traditional CAPM model. Behavioural finance provides new explanations from the perspective of psychological bias and emotion, such as prospect theory, disposition effect, over trading. This paper analyses the causes of stock premium, including investor behaviour, market volatility, information asymmetry and so on, and points out its enlightenment to China's capital market, such as controlling inflation, reducing policy intervention, strengthening market supervision and information disclosure transparency. These results provide a useful reference for improving the institutional design and policy making of China's capital market, and promotes its healthy development.

1 INTRODUCTION

The puzzle of stock premium was an important point put forward by Mehra and Prescott in 1985. By analysing the stock market data of the US S&P 500 index from 1889 to 1978 (Zhou, 2013), they found that the stock yield was about 7%, while the Treasury bond yield, that is, the risk-free bond yield, was about 1% in the same period (Zhu & Zheng, 2013). The stock yield and the risk-free bond yield form the equity premium. However, under the traditional financial model, the phenomenon of equity premium cannot be explained, which leads to the view of "the puzzle of stock premium".

In the western market, the research on the puzzle of stock premium has experienced several stages of development. Early studies mainly focused on the classical capital asset pricing model (CAPM), trying to explain the stock premium phenomenon by improving the model assumptions. However, with the in-depth study, scholars gradually realized that it was difficult to fully explain the causes of stock premium only by traditional models, and then introduced the multi-dimensional theoretical framework of behavioural finance, macroeconomic factors, market

friction and so on (Zheng & Xiao, 2013). For example, Barberis et al. introduced the prospect theory into the asset pricing model to explore the impact of investors' bounded rationality on the stock premium (Barberis et al., 2001).

With the continuous development of the global financial market, China's capital market is also gradually maturing, and China's influence on the international stock market and economy is growing (Shao, 2008). It is of great theoretical and practical significance for China to study the mystery of stock premium. This paper will first review the origin of the puzzle of stock premium and its research progress in the west, then analyse the causes of the puzzle of stock premium, and finally put forward policy suggestions and future research directions for the development of China's capital market. Through the in-depth study of the puzzle of stock premium, one can not only better understand the relationship between risk and return in the financial market, but also provide a useful reference for improving the institutional design and policy-making of China's capital market, so as to promote the healthy development of China's capital market and enhance

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its position in the global financial system (Zhao & Hu, 1999).

2 BACKGROUNDS

2.1 Traditional Finance

Mehra and Prescott first put forward the puzzle of stock premium in 1985, i.e., the real rate of return of stocks is much higher than the risk-free interest rate (Mehra & Prescott, 1985). Traditional finance uses capital asset pricing model (CAPM) to explain the phenomenon of stock premium. The CAPM model was proposed by Sharpe in 1964. It believes that the expected return of assets is proportional to its systematic risk (β value). However, CAPM model assumes that the market is completely efficient and investors are rational, which is quite different from the behaviour of investors in the actual market (Sharpe 1964). It is difficult to explain this phenomenon with a reasonable risk aversion coefficient. Mehra and Prescott pointed out that to explain the stock premium, investors' risk aversion coefficient needs to be as high as 30 to 40, which is in contradiction with the risk aversion coefficient of about 1 observed in reality. Some typical results are shown in Table 1.

Table 1: Comparison between CAPM model prediction and actual rate of return.

β	Risk free interest rate	Market rate of return	CAPM forecast rate of return	Actual rate of return
0.5	2%	8%	5%	6.5%
1.0	2%	8%	8%	9.2%
1.5	2%	8%	11%	12.8%
2.0	2%	8%	14%	15.5%

Data source: risk free interest rate: fed economic data (Fred). Market return: S&P 500 index historical data (CRSP). Actual rate of return: Based on historical stock portfolio (CRSP)

2.2 Behavioural Finance

The rise of behavioural finance provides a new perspective to explain the mystery of stock premium. Behavioural finance believes that the behaviour of investors is affected by psychological bias and emotion, which leads to the market is not always

effective. The explanation mainly focuses on the psychological bias of investors. The disappointment aversion theory explains investors' behaviour of reducing holdings due to the volatility of stock returns by introducing the disappointment aversion coefficient and reference level; Barberis and Huang pointed out in 2007 that incorporating loss aversion and a narrow framework into the traditional utility function can generate. Higher stock premiums and lower risk-free interest rates at the same time, even when consumption growth is stable and the correlation with the stock market is weak (Barberis, et al., 2001). Based on the prospect theory, the short-term loss aversion theory points out that investors magnify short-term loss perception due to frequent portfolio evaluation, which requires a higher stock premium to compensate for psychological costs (Benartzi, 1995). These theories reveal the phenomenon of stock premium that cannot be explained by traditional finance from the perspective of behaviour.

2.3 Empirical Analysis

Prospect theory, proposed by Kahneman and Tversky, emphasizes that investors' perception of loss and return is nonlinear, and their sensitivity to loss is higher than that of return. Barberis, Huang and Santos applied the prospect theory to the asset pricing model in 2001, assuming that investors' sensitivity to loss is higher than income, and the degree of risk aversion will change with the change of investment results (Barberis et al., 2001). This framework can explain the historical data of stock premium.

Utility function is used to describe the risk preference of investors in behavioural finance. The traditional utility function assumes that investors are risk neutral, while behavioural finance introduces the concept of loss aversion and modifies the form of utility function (Mehra & Prescott, 1985).

3 REASONS

3.1 Disposal Effect

The disposition effect was first proposed by Shefrin and Statman in 1985, pointing out that investors tend to sell profitable stocks too early and hold loss stocks too long (Shefrin & Statman, 1985). The existence of disposal effect shows that investors are affected by psychological bias in the decision-making process, especially the aversion to losses and the premature realization of profits.

Odean analysed the trading data of individual investors in 1998 and found that the probability of investors selling profitable stocks was significantly higher than that of selling loss stocks (as shown in Figure 1). This finding supports the existence of disposition effect and shows that investors are significantly affected by psychological bias in the decision-making process (Odean, 1998). Feng and Seasholes found that Chinese investors also showed significant disposition effect through the study of Chinese stock market in 2005. Their research also found that experienced investors are less affected by the disposal effect than novice investors, indicating that investors can reduce the impact of psychological bias through learning and experience (Feng & Seasholes, 2005).

Over trading refers to the phenomenon that investors buy and sell stocks frequently, resulting in increased transaction costs and decreased net return. This behaviour is usually driven by overconfidence and over optimism. Barber and Odean found in 2000 that the annualized rate of return of over traded investors was significantly lower than the market average. Their research also shows that male investors are more likely to show overconfidence than female investors, leading to higher trading frequency (Barber & Odean, 2000).

Attention driven trading means that investors tend to buy stocks that attract their attention, and these stocks may not have good fundamentals. This behaviour is usually driven by media reports, advertisements or other external information sources. Hirshleifer et al. Found in 2011 that media reports increased the trading volume and volatility of stocks. Seen from Table 2, their research shows that when faced with a large amount of information, investors may rely on simple clues (such as stock names or recent performance) to make decisions (Hirshleifer et al, 2011).

Emotion driven trading means that investors' decisions are affected by emotional fluctuations, resulting in excessive buying when market sentiment is high and excessive selling when market sentiment is low. Such behaviour is usually driven by psychological factors such as market sentiment and herding. Baker and Wurgler found in 2006 that market sentiment has an impact on stock returns. Their research shows that investors may be overly optimistic when the mood is high, and may be overly pessimistic when the mood is low (Baker & Wurgler, 2006). Inadequate diversification of investment portfolio means that investors fail to fully diversify investment risks, resulting in unnecessary risks. This behaviour is usually driven by psychological factors

such as local preference and industry concentration. French and Poterba found in 1991 that investors generally have local preferences, leading to the lack of internationalization of the portfolio. Their research shows that investors may underestimate some risks, resulting in insufficient diversification of the portfolio (French & Poterba, 1991).

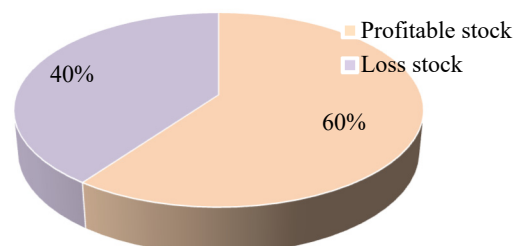


Figure 1: Stock type (Photo/Picture credit: Original).

Table 2: This caption has one line so it is centered.

	Male	Female
Annual average transaction frequency	80%	50%

3.2 Market

Market volatility refers to the volatility of stock prices, which is usually measured by standard deviation. High market volatility may lead investors to demand higher risk premium. Campbell and Shiller found in 1988 that there was a significant correlation between market volatility and stock premium. Their research shows that high market volatility may lead investors to demand higher returns to compensate for risks (Campbell & Shiller, 1988).

Information asymmetry refers to the fact that different participants in the market have different amounts of information, which leads to investors' inaccurate risk assessment of stocks, thus requiring higher returns. Grossman and Stiglitz pointed out in 1980 that information asymmetry is one of the important reasons for market failure. Their research shows that information asymmetry may cause the market price to deviate from its true value (Grossman & Stiglitz, 1980).

4 ENLIGHTENMENTS TO CHINA

Hyperinflation will severely hit the national debt market and the stock market. Holders of government

bonds may sell government bonds in the event of inflation, leading to a decline in the price of government bonds. At the same time, inflation may lead to the bubble of the stock market and eventually lead to the bursting of the economic bubble, as shown by the bursting of the economic bubble in Japan in the 1980s (Zhao & Hu, 1999). In order to promote the healthy development of the capital market, one must strictly control the inflation rate and ensure the stability of the national debt and stock markets.

The time-varying parameters and statistics show that there are limitations in the application of consumption-based asset pricing model in China's stock market. China's stock market is often referred to as a "policy market". For example, the increase in stamp duty on May 30th, 2007 led to a sharp decline in the stock market. Such policy intervention has increased market instability and intensified speculation. In order to improve this situation, the management should reduce direct intervention, strengthen market supervision, crack down on manipulation, improve the regulatory system, improve the transparency of information disclosure, and increase the punishment for violations. Through these measures, China's stock market will gradually mature, making the model introduced from abroad more practical (Song, 2008).

The calculation of stock premium depends on historical data, which may not accurately predict the future market performance. In addition, the risk-free interest rate (e.g., treasury bond interest rate) used to calculate the stock premium also has risks, and the difference of treasury bond interest rate in different periods may affect the calculation results. Due to the particularity of the Chinese market, the Chinese stock market has existed for a short time, and the policy intervention is frequent, and the investor structure is different.

5 CONCLUSIONS

Since Mehra and Prescott proposed the mystery of stock premium in 1985, it has aroused extensive and in-depth discussion in the field of western financial research. The CAPM model of traditional finance is limited by the assumptions of its fully efficient market and rational investors, and it is difficult to reasonably explain the phenomenon that the real rate of return of stocks is much higher than the risk-free interest rate. The rise of behavioural finance provides a new perspective for solving the mystery of stock premium from the perspective of psychological bias, such as disappointment aversion theory, prospect

theory, loss aversion and so on, which enables us to have a deeper understanding of investor behaviour and market phenomenon.

From the perspective of the causes of stock premium, investors themselves have a variety of irrational behaviours, such as disposal effect, excessive trading, attention driven trading, emotion driven trading and insufficient portfolio dispersion. These behaviours are not only affected by psychological factors, but also significantly affect the return on investment in the market. At the same time, the volatility and information asymmetry at the market level make investors face higher risks and demand higher returns, which together contribute to the phenomenon of stock premium.

For China's capital market, the study of the puzzle of stock premium has important theoretical and practical significance. Theoretically, it helps us understand the complex relationship between risk and return in financial markets; In practice, it provides a reference for the system design and policy making of the capital market. On the one hand, controlling the inflation rate is the key to stabilizing the national debt and stock market, and the damage of hyperinflation to the financial market should not be underestimated. On the other hand, the policy management should reduce direct intervention in the market, avoid increasing market instability and speculation, and instead strengthen market supervision, improve the regulatory system, improve the transparency of information disclosure, and severely crack down on market manipulation and other violations, so as to promote the maturity and healthy development of China's stock market, so that international advanced financial models can better play a role in the Chinese market.

However, there are some limitations in the study of the puzzle of stock premium. On the one hand, its calculation relies on historical data, which makes it difficult to accurately predict the future market trend, and the selection of risk-free interest rates and term differences will affect the calculation results. On the other hand, the Chinese market has its particularity, such as short development time, frequent policy intervention, unique investor structure, etc., which makes it necessary to be cautious when learning from western research results. Future research should focus on how to combine the characteristics of the Chinese market and the development technology of artificial intelligence, build a more practical theoretical model, and deeply analyse the phenomenon of stock premium, so as to provide more powerful theoretical support for the long-term development of China's capital market. This study will help to explore the

causes of the mystery of stock premium and provide a better reference for the development of China's stock market.

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