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Capital Asset Pricing Model: A Brief Review on Advantages, Disadvantages and Alternatives

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Abstract: CAPM, or capital asset pricing model, is an important tool for determining the expected returns of individual securities or portfolios and for systematic analysis. It is a strong support for the price theory of modern financial markets and is of great importance to the financial markets of various countries. This paper first introduces CAPM briefly, and then analyzes the advantages and disadvantages of the model one by one and analyzes its effect on the financial market with a practical case study. A number of studies have shown that because its hypothesis does not conform to the actual market, the alternative model of CAPM is introduced, and it is found that whether these models used in finance are applic-ble or not has a great relationship with the data, so the CAPM model and its alternative models are worth further study in pricing.

Keywords: CAPM, finance, asset pricing

1. Introduction

Sharpe, Lintner and Mossin developed the famous capital asset pricing model (CAPM), then, the model becomes a pilar of modern financial economics. The three main tenets of the capital asset pricing model are that investors can borrow freely, that all investors adhere to Markowitz's theory of asset allocation, and that estimates of anticipated returns, variances, and covariances are comparable. Given these assumptions, discovering the interconnections between return and risk becomes an interesting question.

This model computes the anticipated return, variance, and covariance in order to explore the relationship. The model also examines how equilibrium prices are determined and besides, the model is often used in corporate finance and investment decision-making, is the foundation of modern financial market price theory.

The asset capital pricing model is therefore extremely important in both theory and application. By examining the fitness CAPM, researchers can make full advantage of the robust logic and practicality of CAPM to assess the rationality of various securities prices that have been posted. Additionally, it can be used to calculate the price of securities that are ready for listing and predict how different macroeconomic and macro-political events would affect the price of shares. In order to identify issues and advance the growth of the stock market, researchers can also use CAPM to perform both

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theoretical and empirical study on the market. Many scholars have examined this model's significant significance and potential applications in recent years. The CAPM is used by Zhu Hanhuai and Huang Jingjing, the authors argue the nonlinear cross-recurrence with the stock market [1]. Research on a conditional higher-moment CAPM is conducted by Vasco Vendrame et al. They introduce a conditional variant that takes into consideration both changing risk premia and changing factor loadings over time. According to the four-moment CAPM tests, the overall risk premium during the years 1926 to 2021 is estimated to be positive at 0.67% monthly, with all risk premia displaying the expected theoretical signals [2]. Also, researchers broaden the CAMP to International CAPM (ICAPM) with addition of two factors. The research mentioned above demonstrate how important the capital asset pricing model is for real-world applications. This model is worth exploring, researching and applying for the global researchers to strengthen the study of modern financial markets.

2. Advantages

Clarity and simplicity are two of CAPM's primary advantages. The CAPM can be viewed as a different way to measure and value downside risk [3]. Each risky security's price is divided into three parts: the price of risk, the price of return at risk, and the unit used to measure risk. These ingredients are then organically combined.

In the CAPM model, the non-systemic risk (or uniqueness) of an asset is greater than the non-systemic risk of the entire market, including growth stocks and small and medium-sized enterprises, if beta is greater than 1. These businesses are significantly better able to succeed when the state of the broader market improves due to reduced fixed expenses, less debt, a relatively modest revenue base, or a larger addressable market, which results in higher returns.

Growth firms, on the other hand, will have a greater decline in performance and a lower performance of the stock price when the market conditions worsen since they are constrained by low capital levels and unstable customer relationships. If beta is less than 1, as it is in the case of large, well-established enterprises, the asset has a lower non-systemic risk. (Banks, etc.). These large corporations currently hold the oligopoly position in developed markets and are burdened with high fixed expenses and interest costs, which results in generally steady asset income. As a result, their revenue is generally consistent and there is little possibility for rapid expansion.

Every asset's return in an efficient market is defined by its uniqueness (non-systemic risk), which is proportional to the market's overall uniqueness, and the general environment. (Systemic risk, the risk-free return represented by Treasury bonds). We might conclude that the potential profit increases with risk.

In conclusion, the CAPM theory is quite clear, uncomplicated, and in line with life intuition. However, the questions are more important for financial practitioners: how to test whether the market complies with the CAPM, that is, whether it is efficient; and if not, how to add more components and test. Asset price modeling has come a long way since the 1970s, when the CAPM was first introduced. Financial literature has previously argued in favor of using CAPM to predict asset pricing in capital markets. Even while it is still the most popular asset pricing model in use today, it later ceased to serve its primary purpose [4].

3. Disadvantages

CAPM has an assumption flaw. CAPM model is based on strong assumption. CAPM assumes that investors evaluate investments solely on the basis of expected return and risk ratio, implying that investors are role of finance. Secondly, market data is open and accessible, with no insider knowledge. Thirdly, re-traders are free to buy and sell. But in reality, there are transaction taxes and fees to consider, and the marketplace is not fully developed. Moreover, given that investor assumptions are not

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uniform, SML will create a time interval. Therefore, the hypothesis of perfect market hypothesis and homogeneity expectation are inconsistent with the actual conditions.

Yang Shuanghui and Zheng Zhikai chose 50 A-share equities from the Shanghai Stock Exchange, and they calculated the yield for both the stock and the market, regression analysis of the stock data, calculate the beta value for analysis, found that only 26 stocks in the sample had beta ratios between 0.8 and 1.2, and due to market index fluctuations can easily effect more than 50% of stock price changes, in turn, it can be considered that CAPM is not appropriate for China's A-share market [5]. Yang Yixuan selected Shenzhen Stock Exchange stocks to test and establish CLM curves that meet the requirements, and confirmed whether SML curves meet the expectations of CAPM model but discovered that there were several risk structures in the actual financial market, some of which violated the CAPM model's presumptions [6]. Jin Mengying used the monthly return rate of each stock and the average monthly return rate on each stock from January 2018 to June 2019 and the per month returning rate of the Shanghai Composite Index, calculated the α and β values of each stock, and found that there is a flaw in the CAPM itself, which cannot adapt to the complexity of the Chinese trading platform [7]. From a position of capital asset pricing model, Ji Xiaoli analyzed the subprime mortgage crisis and the American subprime crisis according to the determination of the beta value in the calculation of expected income formula, and ultimately reached the conclusion that the theory of CAPM, which assumes the economy as an ideal simplified abstract market, makes some fairly stringent assumptions [8]. There have been persistent doubts about the capital asset pricing model. For example, some scholars found through research that CAPM applicable to one country is not fully applicable to other countries. So, there are still many doubts about the universality and practical application of this model.

4. Alternatives

The CAPM model can be substituted with the Fama-French three component model. The findings contradict the fundamental prediction of the SLB (Sharpe-Lintner-Black) capital asset pricing model (CAPM) that the average return of stocks is positively correlated with market beta [9].

However, a new three-factor model known as CH-3 that was developed in China by merely replicating the methodology used by Fama and French (1993) now firmly controls the field. While leaving a 17% yearly alpha on the earnings-price relationship, the model, in contrast to that model, explains the majority of known Chinese anomalies, including profitability and volatility anomalies. Along with the previously mentioned China-specific components, CH-3 also contains the market factor, size factor, and value factor [10].

Given the disadvantages of CAPM, new alternative modes are introduced. One of the extensions, the seven-factor model, is predicted to have greater explanatory power than both the CAPM model and the Fama and French three-factor model. In comparison to the CAPM, Fama, and French models, the seven-factor model more accurately predicts the expected return. The metrics book value to market value ratio, momentum, liquidity turnover ratio, and commodities index also significantly lower predicted returns in the seven-factor model.

5. Conclusion

First of all, this paper briefly introduces the generation, principle and current research of CAPM, so as to explain the important position of CAPM in the financial market. Then, it introduces the formula of CAPM and its connotation, and discusses the advantages and disadvantages of what kind of financial market the model is applicable to and what limitations will occur. Finally, it discusses the alternative model of CAPM, which are the Fama-French three factor model, CH-3 model and seven-factor model. In general, through the elaboration and discussion of this paper, researchers can have a clearer

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understanding of the connotation of CAPM and the advantages and disadvantages of its application. For the future research of the model, possible directions are also being explored. It can be said that from an international perspective, the application of CAPM will make greater contributions to the pricing of financial markets in different countries, such as international currency risk premium and unsecured interest parity.

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