



Implementing the Capital Asset Pricing Model in Forecasting Stock Returns: A Literature Review

Juniawan Mandala Putra^{1*}, Josua Panatap Soehaditama², Moch Arif Hernawan³, Ika Utami Yulihapsari⁴, Maya Sova⁵

¹Universitas Mercu Buana, ²Institut Keuangan Perbankan dan Informatika Asia Perbanas, ^{3,4}Institut Transportasi dan Logistik Trisakti, ⁵Universitas Respati Indonesia

Corresponding Author: Juniawan Mandala Putra Juniawanmp@gmail.com

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ABSTRAK

A breakthrough in finance and business, the Capital Asset Pricing Model (CAPM) is a model describing the relationship between a stock's risk level and expected return. This study aims to clarify the risk and reward levels of stock investment based on a literature review of previous studies. The research uses qualitative methods, that is, research methods emphasizing the analysis of deductive and inductive reasoning processes and the dynamics of relationships between observed phenomena using scientific logic. Qualitative research is descriptive in nature, as data analysis is not intended to accept or reject hypotheses (if any), but is a form of explanation of observed symptoms.

INTRODUCTION

Harry Markowitz developed the portfolio theory model in 1952. His theory is how risk-averse investors create optimal portfolios that maximize expected returns for a given level of risk, and that risk is an integral part of higher returns. A decade later, in his early 1960s, (Traynor, 1962; Sharpe, 1964; Litner, 1965; Mossin, 1966) developed an asset pricing model based on Markowitz's portfolio theory. The Capital Asset Pricing Model (CAPM) is a breakthrough in finance and business at a time when the theoretical underpinnings of decision-making under uncertainty were established and taken for granted. On the other hand, the underlying empirical facts about capital market returns and risks are unknown.

Barillas & Shanken (2015) highlighted that the Capital Asset Pricing Model (CAPM) model of Sharpe (1964) and (Litner (1965) led to a theory of asset pricing commonly used to estimate a firm's cost of capital. emphasized that Valuation confirms the performance of its investment portfolio. CAPM states that only systematic or market risk impacts investment returns. This is because unsystematic or asset risk can be eliminated through investment diversification (Hendershott et al., 2020). CAPM can be used to estimate the cost of capital and measure the performance of an asset or portfolio. On the other hand, Andrei et al., (2022) showed that investment pricing models combine risk and return in a linear relationship. This relationship uses beta as a measure of risk and states that the only factor affecting capital market security returns is market security returns. A portfolio containing all assets in the market.

On many occasions, CAPM has been considered a controversial model. Its basic assumptions are said to be unrealistic and unattainable in the real world. CAPM has repeatedly failed experimental tests and has been abandoned by many academics and researchers. However, in theory, CAPM remains one of the most important asset models, despite many attempts to create alternative models based on assumptions and more realistic models that address CAPM's shortcomings (Shah et al., 2019). as state, the measurement of the market risk premium is based on the 3 model and 5 factor theory of Fama and Francis, and the liquidity adjustment capital based on the 4-factor theory of Xue & Zang (2015), Based on an asset pricing model, after analyzing the properties of the asset, all insignificant.

For an investor, since the risk in investing is very important, different methods can be used to predict the expected return of an investment such as the point of view of Muhammad & Ali (2018) which use fundamental and technical analysis to predict and aim for stock returns by buying stocks when they are undervalued and selling stocks when they are overvalued. Subsequently, Pedersen et al (2020) proposed Environmental, Social and Governance (ESG) theory to be used to obtain information on the stocks of companies and as a reference for investors on how the equilibrium price of assets is determined by an ESG-adjusted capital asset pricing model that indicates when ESG will increase or decrease the required return. One of the models developed as an alternative to the CAPM is the APT (Arbitrage Pricing Theory) model. Introduced by Stephen Ross in 1976, the APT relaxed some of the assumptions

on which the CAPM was based and focused primarily on the fact that stock returns are influenced by common risk factors, not just market portfolio risk, as assumed by the CAPM. Elshqirat (2019) research demonstrated that testing the relationship between equity returns, calculated using the stock index, and macroeconomic variables using APT (Arbitrage Pricing Theory) as an alternative measurement model of the Capital Asset Pricing Model (CAPM).

Based on these phenomena and theoretical gaps, the authors wish to explore the theory of the financial asset pricing model through a review of the literature published by previous researchers. The author focuses solely on reviewing the literature on the implementation of the Financial Asset Pricing Model (CAPM) to predict expected returns or returns on investments, whether stocks or shares. other investments.

THEORETICAL REVIEW

Stock Market

The stock market is an important factor and foundation for any economy that continues to grow and improve, and for any capital market investment that seeks to maximize returns while minimizing the resulting risks. As a result, many studies of stock market forecasting using technical or fundamental analysis have been conducted using various algorithmic techniques and computer software (Nti et al., 2020). As a result, many studies of stock market forecasting using technical or fundamental analysis have been conducted using various software techniques and algorithms (Hiransha et al., 2018). However, many use the CAPM method (Zerbib, 2019; Barillas & Shanken, 2015; Galagedera, 2012; Altay & Çalgıcı, 2019).

However, the dynamic, non-linear, non-stationary, non-parametric and complex nature of the market makes it very difficult to analyze stock market movements and price movements. According to Zhong & Enke (2017), stock markets are influenced by many interrelated factors, including economic, political, psychological and firm-specific variables. Technical and fundamental analysis are his two main approaches to analyzing financial markets (Jiang, 2021). Investors use these two main methods to make decisions in financial markets, invest in stocks, and earn high returns with low risk (Arévalo et al., 2017);(Suryawan et al., 2021).

Capital Asset Pricing Modal (CAPM)

This section describes a relationship called Capital Asset Pricing Capital (CAPM), which is based on simple principles of financial logic. The basic argument of this financial theory is that assets with the same systematic risk should have the same expected return, i.e., asset prices in the capital market are adjusted so that assets with the same risk have the same expected return. The CAPM model is a further development of Markowitz's portfolio theory and introduces the new terms systematic risk and specific/unsystematic risk. In 1990, William Sharp won the Nobel Prize in economics for his theory of the price of financial assets, which became known as the Capital Asset Pricing Model (CAPM) (Altay & Çalgıcı, 2019). The CAPM is a model that gives a

degree of safety threat steady with portfolio theory. This version calculates the undiversified threat of a portfolio and compares it to the assorted threat of a well-assorted portfolio (Bai & Green, 2020).

(Barberis, 2018) argued that the Capital Asset Pricing Model (CAPM) is the main achievement of modern finance. While the capital valuation model cannot be demonstrated empirically, the capital valuation model is widely used because it is accurate enough for important applications. Rossi (2016) The CAPM describes it as a useful tool for estimating a company's cost of capital and the rate of return investors need to invest in company assets.

For investment practices and firms, the systematic risk (beta) of stocks can be estimated using a variety of asset pricing models (Bertomeu & Cheynel, 2016). The capital asset pricing model assumes that investors are single-period planners, equally aware of market conditions and looking for the optimal average portfolio variance (Henrique et al., 2018). Also, the capital asset pricing model states that the ideal stock market is a large stock market, investors are price takers, there are no taxes or transaction fees, all assets are publicly tradeable, and investors assumes that it can be borrowed or lent. It is not limited to risk-free fixed interest rates. Under this assumption, every investor has the same risk his portfolio.

METHODOLOGY

In writing this article, the author adopts a qualitative method, a research method that emphasizes the analysis of deductive and inductive reasoning processes and the dynamics of relationships between observed phenomena using scientific logic (Raihan, 2017). Qualitative research is descriptive in nature, as data analysis is not intended to accept or reject hypotheses (if any), but is a form of explanation of observed symptoms.

In terms of research, this paper is about equity investments in capital markets and focuses on the analysis of the Capital Asset Pricing Model (CPAM) method, such as the analysis performed on investments and portfolios.

RESULT AND DISCUSSION

Implementation of the Capital Asset Pricing Model

Since the introduction of CAPM (Lintner, 1965; Sharpe, 1964) researchers have studied its empirical properties. The main prediction of this model is that the expected return on an investment is equal to the beta asset multiplied by the expected excess return of the market portfolio (Gregoriou et al., 2019). When an investor decides to invest, he naturally expects high returns in the future. But at the same time, they recognize that there is a high level of risk, of course according to the expression high risk, high return. However, some investors are still willing to take significant risks. Investors who tend to avoid risk (risk aversion/risk avoidance), get expected returns, usually seek to invest in risk-free or low-risk assets (Ahmed et al., 2018).

In this case, the diversification of investment activities is very important to avoid high risks and possible investment losses. According to Markowitz's definition of portfolio diversification, the risk of a portfolio decreases as more

stocks are added. Various methods are used to reduce risk when investing in stocks, bonds and other investment instruments, including the use of the investment pricing model (CAPM) method. Many experts have studied the application of the Capital Asset Pricing Model (CAPM) to determine and predict returns on investment portfolios for individuals and companies; (Pham & Phuoc, 2020; Chordia et al., 2015; Acheampong & Swanzy, 2015).

The investment pricing model is the most commonly used asset pricing model in the stock market. Professionals most commonly use CAPM to estimate a company's equity beta and cost of capital using monthly and/or short-term data (Pham & Phuoc, 2020). To get the maximum return on an investment, several variables must be considered, including the cost of funds. Bai & Green, (2020) argue that the cost of capital and other investment decision criteria also depend on which model is a valid representation of asset prices and returns. A key finding of asset pricing theory is that the cross-section of expected returns should be explained by exposure to systematic risk factors. (Lettau & Pelger, 2018).

Rossi (2016) explains that CAPM is a useful tool for investors to estimate the cost of capital and corporate returns required to invest in corporate assets. CAPM accounts for the trade-off between capital return and risk by measuring an asset's risk as the covariance of return on overall market return. The main prediction of this model is that the expected return of any two assets is linearly related to the covariance of that asset's return and the market portfolio's return. All assets are subject to two types of risk,

The CAPM is attractive because it provides powerful and intuitive projections of expected returns and risks and overall risk management. Unfortunately, the experimental results of this model are still below average (Acheampong & Swanzy, 2015), empirically the multifactor asset pricing model developed by Fama & French (1992) has been shown to be superior and accurate compared to the of capital assets (CAPM) with a single factor. Furthermore, Fama & French (2004) showed that the CAPM equation measures the relationship between the expected return on capital and the return on the market portfolio. However, market portfolios have been criticized for being based on unrealistic assumptions, such as one-year investments and unlimited risk-free credit. Fama & French (2004) conclude that the main models are based on unrealistic assumptions that need to be tested in practice.

CAPM is based on the core idea that market portfolios of assets under management are efficient mean-variance. Given this concept of market average diversification efficiency, investors are expected to act rationally and choose portfolios that: (1) minimizes the return variance of a portfolio that provides the expected return, and (2) maximizes the expected return given the variance. This indicates that: (a) the expected return of a security is a positive linear function of the market beta (the slope of the regression of the security's return on the market) and (b) the market beta is the cross-section of the expected return. (Fama & French, 1992). The CAPM relies on the assumption that beta is the primary determinant of systematic risk to explain equity returns. The model is shown below:

$E(R_i) = R_f + \beta_i [E(R_m) - R_f]$ which means that $E(R_i)$ expected return of assets/portfolio I, $E(R_m)$ is the expected return on assets from the market, R_f return of risk-free assets, β_i is a beta asset.

Bertomeu & Cheynel (2016) argue that the CAPM provides a basis for estimating the discount investors need to resist this uncertain exposure. This section focuses on the cost of capital component represented by the risk premium when a risk averse investor/trader makes portfolio decisions in a competitive market. Meanwhile, Kuehn et al., (2017) explore how other variables, especially macro variables, can be integrated into the valuation of financial assets. The results of the study showed that macro variables have a significant effect on the rate of change in stock returns. Gregoriou et al. (2019) show that with seven new factors incorporating peaks and endings as additional explanatory variables, the CAPM is the most accurate asset price model in finance and should be used by academics and practitioners to inform investment and research strategies made on a financial return basis.

Zerbib (2019) uses simple asset pricing with partial segmentation and heterogeneous preferences among investors to reflect the dual practice of sustainable investing based on exclusion and asset surplus or shortage. developed the model. It shows how expected excess returns differ from those predicted by the capital asset pricing model (CAPM), showing his two types of premiums occurring at equilibrium: two taste bonuses and two exclusion bonuses.

As the asset pricing literature has evolved and matured over time, researchers have added more complex elements to their models, such as heterogeneous expectation and aversion (Pohl et al., 2018). The Capital Asset Pricing Model (CAPM) is not the only model that describes how the market values an asset or determines the correct return on capital. Ross (1976) formulated a theory called Arbitrage Pricing Theory (APT). If the CAPM analysis assumes that capital represents an efficient portfolio (because CAPM underlies the market portfolio, it is an efficient portfolio), then APT is based on the concept of price (law of pricing). I'm here. Investment opportunities have the same characteristics and cannot be sold at different prices. When an asset with the same characteristics sells for different prices, there is an opportunity to buy the asset at a lower price and sell it at a higher price for a risk-free profit (Pesaran & Smith, 2021).

The difference between the two models lies in the way the APT treats the yield-bond relationship. APT believes that earnings are affected by various industry and economic factors. The correlation between the profitability of the two stocks appears because they are influenced by the same factors. CAPM, on the other hand, recognizes that there is a correlation between returns, but the model does not account for factors that affect this correlation. CAPM and APT believe that there is a positive correlation between expected return and risk. Ultimately, investors can choose a method of measuring the return on an investment based on their needs, and a low-risk method that offers high returns can be used to predict the profit that will be made in the future.

CONCLUSIONS AND RECOMENDATION

Capital asset pricing models assume that investors plan ahead, see the same market conditions, and aim for optimal diversification of an average portfolio. Also, the pricing model for financial assets is that the ideal stock market is a large stock market, investors are price takers, there are no taxes or transaction fees, all assets are listed, and investors can be borrowed or lent, and assumes no restrictions. risk-free fixed rate (risk-free fixed interest rate). The investment valuation model as a balance sheet model can simplify the picture between return on equity and risk. The systematic risk considered in this study is called beta because the unsystematic risk can be eliminated by the diversification method.

Investors' desire to make big profits with little risk still makes potential investors fearful or hesitant to invest. Potential investors' lack of investment skills also leads to inaccuracies in predicting returns and risks, leading to inappropriate investment decisions. Investment risk is systematic risk and unsystematic risk. Systematic risk includes inflation, rising interest rates, and economic conditions that affect investments, while unsystematic risk is risk that applies only to certain investments. For example, the risk of failure in business performance. This risk should be known to any investor investing in order to determine bailouts or delve into what happens next.

Barillas & Shanken (2015) found that the CAPM (Capital Asset Pricing Model) is the most popular and widely used model by professionals. The capital asset pricing model was introduced by Sharpe (1964) and Lintner (1965) to determine the net return on assets.

The Capital Asset Pricing Model (CAPM) is not the only one that explains how assets are valued by the market or how to determine what return is considered reasonable on an investment. Ross (1976) formulated a theory called Arbitrage Pricing Theory (APT). If CAPM analysis assumes that capital forms an efficient portfolio (because the market portfolio, which is at the core of CAPM, is an efficient portfolio), then APT relies on the concept of a price (the law of 'a price).

The difference between the two models is in how APT treats bond yields. The appeal of APT is that the CAPM does not have to identify which market portfolios should be efficient for calculating beta. Unfortunately, we do not know or cannot identify some of the factors identified by APT. CAPM, on the other hand, combines macro factors into a single factor that reflects the market performance of the portfolio.

Buying stocks as an investor depends on the initial objective of the investment activity, which is to generate returns (profits) taking into account various internal circumstances, and not to buy speculatively. When deciding to invest in the capital market, investors must take into account the uncertainty (risk) of the future. The hope of high profits can come, but of course by digging up information about the investment to buy, the performance of the company and digging up information about the financial performance of the company whose shares are to be bought.

To limit the risk of losing your investments, it is best to use investment portfolio management. Several models have been developed to describe the relationship between risk and return in terms of portfolio diversification. Portfolio can be defined as a collection of fixed assets. In the form of stocks, gold, deposits, bonds, real estate and other commodities. An investor can use portfolio management while managing assets to deliver the expected profit. The hope and purpose of investing in stocks and others is to generate significant returns with minimal risk. In other words, reduce investment risk using investment diversification from portfolio theory.

The study hopes to contribute ideas and references related to making stock investment decisions using the Capital Asset Pricing Model (CAPM) method and to provide additional information on investing in the capital market so as to minimize the probability of mistakes in making investment decisions and can achieve the expected returns that investors expect. On the other hand, more information has been obtained from various expert opinions showing the importance of a measure or method of predicting return using the Capital Asset Pricing Model method so that it can be used as a reference for further research.

This study should have benefits for stakeholders, especially academics, can be used as additional literature in the field of financial management, and provides empirical evidence that the capital pricing model offers simplicity and ease of prediction returns to be derived from an investment.

It is hoped that the results of this document can provide potential investors with additional information on the asset pricing model when investing in the capital market, so that they can mitigate and avoid errors in the selection of investments and decision-making, leading to a guide to do so can bring the expected benefit later.

ADVANCED RESEARCH

There are several limitations to writing this article, namely the subject of a brief discussion of the Capital Asset Pricing Model (CAPM) such that the discussion does not fully describe the theory as a whole. The bibliographic research and the processing of writings are not presented systematically due to the short time available. And the weakness of the writing is that it is only a review of the literature on one subject, the CAPM. Although many other methods can be discussed to perform ROI measurements and estimates. It is hoped that for further research, a broader scope can be discussed with more comprehensive literature.

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