



## Theoretical and empirical review of asset pricing models: A structural synthesis

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### Abstract

The most important issue in financial economics is the pricing of financial assets, particularly the calculation of the price of a risky financial asset. This study's major goal is to examine asset pricing models' conceptual foundation and explore how security analysis might be affected. A thorough theoretical analysis of asset pricing models is also provided in this work, with a focus on static and dynamic versions that are consistent with the results of the empirical studies. Asset pricing and its implications are a topic that receives a lot of attention in the financial economics literature. The work offers a theoretical derivation of the "capital asset pricing model" (CAPM), a common name for the equilibrium model. This model was created almost simultaneously by Sharpe (1964) and Treynor (1961), and it has since been expanded and clarified by Lintner (1965), Mossin (1966), and Black (1972). Variations in expected return over time are common in securities and logically related to market circumstances. As a result, the static CAPM is converted into the "conditional capital asset pricing model" (CCAPM), a modified version of the "asset-pricing" model. The "arbitrage asset pricing" theory (APT), an alternative equilibrium asset-pricing model, was developed by Ross in 1976. The core ideas behind the arbitrage pricing theory are also explored, along with the empirical literature assessment and critical evaluation of the theoretical and empirical models. Additionally, the "Cahart four factor models", the "Fama French five factor model", and the "Fama French three factor model" are discussed in this study. The primary objective of an "asset pricing" model is to determine the current value of future rewards or cash flows after taking risk and time lags into account. The challenge with the discounting process is that the important variables that influence payoffs change with time, despite the theoretical framework still being effective for incorporating the changing variables into "asset pricing" models. By offering a thorough analysis of the models and a structural empirical evaluation of the historical stream of empirical studies, this paper addresses a gap in the literature.

**Keywords:** asset pricing, risk factors, return, cross-section, volatility

### Introduction

The concept of "asset pricing" is concerned with the cost of claims that rely on erratic payments. According to Cochrane, J. H. (2009), the concept presupposes that a security's price and its discounted expected payoffs are comparable. Therefore, to determine the price of an item, the estimated payment must be subtracted from the interest rate requested by buyers. It causes the price of an item and the rate of return to be negatively correlated. A lower (higher) asset price implies a higher (lower) discount rate. The cost of a financial asset, particularly one that is risky, is the most crucial aspect of macroeconomics. The discipline of "asset pricing" theory, a key concept in financial economics, has responded to this important topic. The procedure of determining the value of a financial asset, especially one that is risky (Chhapra, I. U., & Kashif, M. (2019) <sup>[1]</sup>. Asset pricing models serve an exclusive use in financial economics. Along with other things, they can be used to evaluate asset markets' informational efficiency as well as how well managed portfolios are as well as how much capital companies will need to operate. According to Lalwani, V., and Chakraborty (2019) <sup>[2]</sup>, the primary goal of an "asset pricing" model is to find common traits that seem to influence returns over a wide range of stocks or assets, or to represent the distribution of predicted stock returns. The five categories of "asset pricing" theories are as follows. For this reason, the key five "asset pricing" models—"CAPM", "Arbitrage pricing model", "Fama-French three-factor model", "Cahart four-factor model", and "Fama-French five-factor model"—were created.

Early in the 1960s, Sharpe Linter developed the single index model (CAPM) to symbolise the linear adjusted relationship between asset or portfolio return and market risk beta. In the 1970s, Ross and Roll put forth the "Arbitrage Pricing Theory" (APT). It was a model with several independent small- or large-scale variables to represent the asset return ( $R_i$ ) without defining the identities of the variables. (Salameh, H. 2021) <sup>[6]</sup>. The Cahart Four element Model adds the "momentum factor" to the value, market, and size risk aspects that are included in the Fama-French Three Factor Model and that affect the return on any financial asset. Along with profitability and investment factors, the "Fama-French five factor" model also takes market, size, and value risk into account. The size "(SMB)" component is determined by the book capitalization of the sample securities, and the value "(HML)" is determined by the book to market ratio. The "investment factor" (CMA) is the difference between the returns of conservative and aggressive investors, and the "profitability factor" (RMW) is the difference between the returns of businesses with strong (high) and weak (low) operating profitability (Khudoykulov, 2020).

### Review of literature

The asset pricing model has been the subject of several studies both domestically and overseas over the past few decades, and many models have been suggested and tested for empirical validity. Researchers review several studies, including the following ones:

1. In their study work titled "Price Discovery and Volatility Spill-over in future and Spot Commodity Market" (Kumar Mahalik, Acharya, & Suresh Babu, 2014)<sup>[4]</sup>, the authors sought to examine Price Discovery & Volatility Spill-over in the Indian spot-future commodity market. The study used secondary data from MCX Mumbai along with a vector error correction model, co-integration, and to analyse how prices are discovered. The MCXCOMDEX, MCXAGRI, MCXENERGY, and MCXMETAL indices are used. After correcting the dates and omitting observations due to holidays, the study period was from 2005 to December 2008. The results of the study indicate that VECM skews the Price Discovery function in the Spot Market, indicating that information flows from the Futures to the Spot Commodity Market but that Retribution Causality is nonexistent. The metal future and metal spot price index are found to not be co-integrated, as well.
2. (Döpke and Tegtmeier, 2018)<sup>[5]</sup> Attempts were made in a study on "Global Risk Factors in the Return of Listed Private Equity" to investigate macroeconomic variables that might affect the anticipated return of Listed Private Equity. The structure of return across listed private equity was captured in this study using an "unconditional asset pricing" model. The study was conducted between 2004 and 2016. By employing seemingly unrelated regression, it is discovered that stock markets are 1, and this is disproved using the generalised method of moment orthogonal conditions. The authors' sample was affected by the financial crisis, which was a key weakness in this study.
3. (Salami & Haron) 2018<sup>[6]</sup> They investigated the price effectiveness of the Malaysian crude palm market before and after the structural break in their paper, "Long Term Relationship of Crude Palm Oil Commodity Pricing Under Structural Break." Co-integration was employed by the author to assess the effects of structural break on pricing efficiency before and after the structural break using closing prices for CPO and CPO futures for the time period from 2009 to 2016. The investigation revealed that the structural breach had no effect on how well the market priced goods.
4. A study on "Price discover & Pairs trading potential: the case of metals market" was done by (Thazhugal Govindan Nair, 2021) with the intention of analysing the price discovery process in metal futures markets and confirming the expectation theory of asset pricing. The author examined possible benefits from trading in the metals market between 2008 and 2019 using the Johansson co-integration and vector error correction model. The author stressed that the metal market's price fluctuations are not arbitrary and that the current prices for the "future" constitute an accurate prediction of the spot metal prices in the future.
5. "The role of efficiency in capital asset pricing: a research of Nasdaq Technology sector" by Aygoren & Balkan (2020)<sup>[8]</sup> sought to examine the role of efficiency in capital asset pricing as well as the effects of four factor models that include the efficiency factor on the return of Nasdaq technology firms. The author chose 147 firms between July 2007 and June 2017 and evaluated them using the temporal regression method for the CAPM, Fama-French three component and four factor models. It is determined that the proposed four factor model has greater explanatory power than both the CAPM and the fama-french three component models.
6. In their study titled "News and Social Media Emotions in the Commodity Market," (Shen, Najand, Dong, & He, 2017)<sup>[9]</sup> sought to determine whether or not media-based emotions may be used to forecast future commodity returns. The 14 years of daily commodity market index, gold and crude oil returns, as well as market-level attitudes and emotions, were analysed by the author using GARCH and VAR. It was found that certain emotions significantly affect the returns on particular commodities but not the returns on the commodity market index.
7. "Role of leverage and liquidity risk in asset pricing: evidence from Indian stock market" (Jain & Singla, 2021)<sup>[10]</sup> examined if the five-factor model with leverage and liquidity was superior than the CAP, Fama-French three-factor model, and leverage four-factor model. The author employed 183 firms' worth of secondary data from the Nifty 500 indices between 2004 and 2017 and temporal regression, basic OLS regression, and hierarchical linear regression methodology. The author found that the five factor model outperformed the other models and had the highest explanatory power.
8. (Le & Gregoriou, 2021)<sup>[11]</sup> sought to examine the relationship between stock liquidity and asset pricing using a new price impact ratio adjusted for free float at the approximation of liquidity in their study entitled "Liquidity and Asset Pricing Evidence from a New Free Float Adjusted Price Impact Ratio". To examine the importance of the created price impact ratio, the author employed univariate and multivariate econometric approaches on a sample of US listed businesses from 1997 to 2017. According to the author, the free float adjusted price impact ratio is the best price ratio. The researcher also found that the results are resilient to the financial crisis from 2007 to 2009.
9. In their study titled "Multi factor asset pricing models in emerging and developed markets," (Lalwani & Chakraborty, 2020) sought to assess the effectiveness of several multifactor asset pricing models in emerging and developed markets. In this article, the author used the parameters to assess how well various models performed in relation to one another. Average adjusted K2 and the GRS metric. For a period of 25 years, from June 1992 to May 2017, the researcher collected data from 5 developing and 5 emerging nations. Because the stock markets in Australia, Canada, China, and the United States are all integrated, it was determined that the fama-french five factor model enhances pricing performance for stocks in these nations. The three factor and four factor models appear to be more appropriate for other nations.
10. (2019, Chhapra & Kashif)<sup>[11]</sup> They examined the implications of risk-averse investors' desire for larger moments and downside risk in their research article, "Higher Co-moments and Downside Beta in Asset Pricing." In order to assess the reliability of the results, the author collected data from 901 firms between 2000 and 2016 and applied generalised moments and the

Wald test. The author pointed out that while co-skewness, co-kurtosis, and down side beta are all significant risk variables, only down side beta actually has a price that is higher than what co-variance risk can account for, and CAPM does not capture the market risk premium to a substantial extent.

11. (Maitra, 2018) <sup>[12]</sup> in his research on "Do seasonality, break and spillover effect explain commodity price volatility: evidence from Indian commodity market." Aiming to determine whether seasonality has any impact on volatility, structural breaks in the variance are found, and seasonality, structural changes, and spillover effects are all investigated to determine their combined effects. In order to quantify the impacts of seasonality, breaks in studies by cumulative sum of scales of GARCH and E-GARCH models are quantified by including seasonal dummies, break dummies, and variable equation to determine spillover effect. The author utilised monthly dummies for this. The author noted that because the impacts of seasonality are so large, they cannot be ignored. According to statistics, seasonality and structural breaks might lower volatility.
12. (Handika & Putra, 2017) <sup>[13]</sup> sought to examine the accuracy of various volatility models using a value at risk Approach and to examine the relationship between the accuracy of volatility modelling and investment performance in the financialized commodity market in their studies titled "commodities returns volatility in financialization era". The VOR back testing method was applied to five distinct time horizons and sis models in this investigation. The author came to the conclusion that the experimental (GARCH) VOR model used to be best for gold, silver, and corn (short horizon), but the moving average VOR model tends to be the best for oil, copper, wheat, and corn(long horizon). Also stated that higher returns in the finalised commodity market will be given to modelling volatility.
13. The goal of the study "Market efficiency in Indian commodity futures markets" by Brajesh Kumar and Ajay Pandey (2013) <sup>[14]</sup> was to examine the short- and long-term market efficiency of the Indian commodity futures market using various asset pricing models. For long-term market efficiency, the author employed Johansson co-integration, while short-term price dynamics are examined with a constant & time-varying risk premium. The author came to the conclusion that most commodity near-month future prices are co-integrated with the spot price in terms of long-term efficiency. Additionally, the author discovered that none of the commodities had co-integration relationships, and some short-term inefficiency was present.
14. The authors of the study "Emerging market currency risk exposure: Evidence from South Africa" (Molele & Mukuddem-Petersen, 2020) <sup>[15]</sup> sought to determine the extent of foreign exchange exposure of listed non-financial enterprises in South Africa. In this article, the author calculated the exposure to foreign exchange risk in connection to the South African exchange rate in respect to the US dollar, the euro, the British pound, and the trade-weighted exchange rate. This study was based on Jorison's 1996 augmented market model. On the basis of the basic enhanced market model, it was

discovered that foreign exchange risk exposure levels were predicted to be greater than 40% for all proxy currencies. After controlling the un-systemic risk, three models discovered that exposure levels were between 6.5 and 12%.

15. In their study titled "Comparative analysis of mean variance and semi-variance approaches on global and local single market model for developed and emerging markets," (Yildiz, Erzurumlu, & Kurtulus, 2020) <sup>[16]</sup> sought to compare the traditional CAPM and downside CAMP risk parameters in order to gain further understanding of which risk parameter results in risk measures that perform better at predicting stock returns. Downside betas outperform CAPM betas in explaining stock return, and both risk measure groups outperform each other for emerging markets, according to the author's analysis of secondary market index data from 2000 to 2018 using both global and local indices.

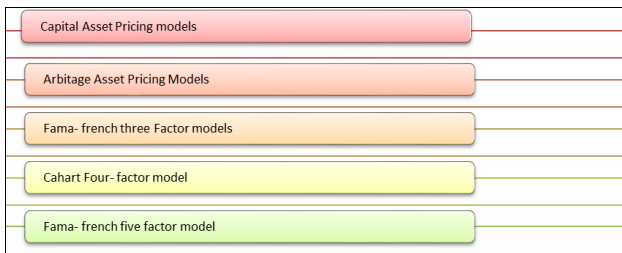
**Conceptual framework of Asset pricing theories**

The study of claims to uncertain future payments is called asset pricing. Timing and payment risk are two essential factors in determining an asset's value. Although time effects are generally simple to understand, risk corrections are a much more significant factor in determining the value of many assets. For instance, American equities have provided an average real return over the past 50 years of roughly 9%. The only part of this that can be attributable to interest rates is around 1%; the other 8% is a premium for taking on risk.

**Asset pricing models**

Asset Class	Equilibrium Pricing	Risk Neutral Pricing
Equities  (and Foreign exchange and commodities; Interest rates for Neutral pricing)	<ul style="list-style-type: none"> <li>• Capital asset pricing model</li> <li>• Consumption Based CAPM</li> <li>• Intertemporal CAPM</li> <li>• Single-index model</li> <li>• Multifactor factor model</li> <li>• Fama- French three factor model</li> <li>• Cahart four- factor model</li> <li>• Arbitrage pricing theory</li> </ul>	<ul style="list-style-type: none"> <li>• Black- Scholes</li> <li>• Black</li> <li>• Gamm-an-Kohlhagen</li> <li>• Heston</li> <li>• CEV</li> <li>• SABR</li> </ul>
Bonds, other interest rate instruments	<ul style="list-style-type: none"> <li>• Vasicek</li> <li>• Rendleman-Bartter</li> <li>• Cox-Ingersoll-Ross</li> </ul>	<ul style="list-style-type: none"> <li>• Ho-Lee</li> <li>• Hull-White</li> <li>• Black Demnan Toy</li> <li>• Black- Karasinski</li> <li>• Kalotay-Williams-Fabozzi</li> <li>• Longstaff-Schwartz</li> <li>• Chen</li> <li>• Rendleman-Bartter</li> <li>• Health-jarrow-Morton</li> <li>• Cheyette</li> <li>• Brace-Gratarek-musiela</li> <li>• LIBOR market model</li> </ul>

in this section, an effort has been made to outline the evolution of different asset pricing models that adhere to the equilibrium pricing for stocks (as well as for commodities, foreign exchange, and interest rates for risk-neutral pricing). Five different "asset pricing" models are used in this study, including the "CAPM," "Arbitrage pricing model," "Fama-French 3 factor model," "Cahart 4 factor model," and "Fama-French 5 five model." These models' succinct descriptions are as follows:



**1. “Capital Asset pricing model”**

The “Capital Asset Pricing Model” (CAPM), the most well-known model in asset pricing, will be derived in this section. The CAPM was created independently by Sharpe (1964) and Lintner (1965a) by employing the portfolio theory to create a market equilibrium. The portfolio theory with a riskless asset and limitless short sales serves as the foundation of the CAPM. To determine market equilibrium, we combine investor decisions rather than only taking one into account. According to portfolio theory, an asset's price is exogenously determined and cannot be changed by any investor. The needed rate of return for an asset under this strategy is linearly connected to its beta value, or systemic risk (Drobetz and Otto, 2021). The local Beta of the asset as a risk indicator only fully explains the link between risk and return when markets are entirely segregated. It helps investors comprehend how risk and return interact with securities (Khudoykulov, K. 2020). This model states that the expected return is linearly related to the asset's correlation with the market portfolio. The covariance can be thought of as a way to quantify the risk associated with a specific asset (covariance risk). This danger should also be divided into two categories. Systematic risk is the type of risk that diversification cannot further diminish, but unsystematic risk is the type of risk that can be mitigated. The volatility of the market as a whole (systematic risk) and an asset-specific risk (unsystematic risk) make up the total risk of an asset. Effective portfolios only contain systematic risk; unsystematic risk is not present since unsystematic risk can be reduced by diversification and is not offset by the market.

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

Where;

ER<sub>i</sub> is short for expected return on investment.

R = risk-free rate

The investment's beta is 1.

ER<sub>m</sub>-R<sub>f</sub> is the market risk premium.

**2. Arbitrage Pricing Theories**

Despite difficulties in identifying the market portfolio and criticisms of the mean-variance criterion, a key aspect of the “CAPM” idea is the grouping of all risks into a single risk factor, the market risk. This aggregation is helpful for creating optimal or at least well-diversified portfolios, but it may present issues when used to explain the returns of specific assets (Krause, A. 2001). It is clear that industry- or country-specific impacts also have a significant impact on returns, in addition to more general factors like market movement. The Arbitrage Pricing Theory (APT), first introduced by Ross (1976), is a counterargument to the CAPM that is presented in this section.

Stephen Ross's alternative asset pricing model is referred to as the "arbitrage pricing theory." One of the strategies employed by investors and portfolio managers is “arbitrage pricing theory”. APT uses fewer assumptions than CAPM to describe the nature of equilibrium in “asset pricing” in a less complex manner.

**Arbitrage**

The practice of making money by taking advantage of differing asking prices for the same asset is referred to as arbitrage. Profit without risk is produced by the technique. In the securities market, it entails the simultaneous purchase and sale of the same security at a price that is comparatively lower, even if the price obtained in this way is risk-free. However, the arbitrageur's buying and selling activities cut down on and eventually eliminated the profit margin, returning the market price to its equilibrium level.

According to Stephen Ross, a variety of macroeconomic variables have an impact on the returns of the securities. Some of them are the rate of increase in industrial production, inflation, the spread amongst long-term and short-term interest rates, and the quality of low-grade and high-grade bonds. The arbitrage represented by the equation:

$$R_i = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2} + \dots + \lambda_j b_{ij}$$

R<sub>i</sub> = “median expected return”

λ = “the sensitivity of the return to b<sub>i1</sub>”,

b<sub>i1</sub> = “the appropriate factor-specific beta co-efficient”

**3. “Fama- French Three Factor Model”**

As an extension of the Capital Asset Pricing Model (CAPM), Eugene Fama and Kenneth French, professors at the University of Chicago, developed the Fama-French Three-factor Model in 1992. The scope of the capital asset pricing model is increased by adding the size and value risks to the market risk portion of the CAPM model. According to the Fama-French model, stock returns can be explained by three variables: market risk, relative outperformance versus large-cap companies, and relative outperformance versus low book-to-market value companies. High value and small-cap companies usually outperform the broader market, which serves as the model's explanation. According to the Fama-French three-factor model, value companies will beat growth companies over the long term, while small businesses will outperform big ones. The model may account for more than 90% of the returns of diversified portfolios, according to studies by Fama and French. The three-factor model is founded on the same premise as the CAPM: riskier investments demand larger returns.

- The difference between the market's anticipated return and the risk-free rate is known as the “market risk premium”. Investors are compensated with an excess return over and above the risk-free rate to make up for the greater return volatility.
- SMB: A company's market capitalisation determines the “Small minus Big” (SMB) size impact. Small-cap companies historically have an advantage over large-cap corporations, according to SMB. Using linear regression, SMB may be located and its beta coefficient calculated ( ). Both positive and negative numbers are possible for a beta coefficient. The major justification

for this component is that small-cap firms usually offer higher long-term returns than do large-cap firms.

- **HML:** A value premium is determined by taking High from Low. This indicator shows how companies with a high book-to-market value ratio (value firms) and those with a low book-to-market value ratio differ in their returns. The HML factor's beta coefficient can be computed using linear regression once it is known, just like the SMB factor's beta coefficient was. Both positive and negative values of the HML beta coefficient are possible. According to the HML factor, value stocks beat growth companies with low book-to-market ratios in terms of long-term returns.

#### **Fama- French three Factor model is represented by this equation**

$$r = r_f + \beta_1 (r_m - r_f) + \beta_2 (SMB) + \beta_3 (HML) + \epsilon$$

Where

- $r$  = "Expected rate of return"
- $r_f$  = "Risk-free rate"
- $\beta$  = "Factor's coefficient" (sensitivity)
- $(r_m - r_f)$  = "Market risk premium"
- **SMB (Small Minus Big)** = "Historic excess returns of small-cap companies over large-cap companies"
- **HML (High Minus Low)** = "Historic excess returns of value stocks (high book-to-price ratio) over growth stocks (low book-to-price ratio)"
- $\epsilon$  = Residual error

#### **4. Cahart Four- Factor Model**

A few years after the "Fama-French three factor" model was introduced (1993), the Carhart 4 factor model was proposed. Cross-sectional momentum, the factor, was found a few years earlier by Jegadeesh and Titman rather than Carhart. However, Carhart showed how the momentum component differed from the "Fama and French" (1993) factors and how it improved the explanatory power of multifactor models meant to explain the performance of mutual funds. The "Carhart 4 Factor model" is a well-known multifactor approach for pricing securities. Mark Carhart made the suggestion in 1997. The cross-sectional momentum element in the "Carhart four-factor model" significantly boosts the multifactor model's explanatory ability. Mathematical presentation of Cahart Four- Factor Model

$$r = r_f + \beta_1 (r_m - r_f) + \beta_2 (SMB) + \beta_3 (HML) + \beta_4 (MOM) + \epsilon$$

In addition to above three factor model the Cahart consists one more factor that is;

#### **Momentum Factor**

Subtract the equally weighted average of the lowest-performing firms from the equally weighted average of the highest-performing firms, with both averages being one month behind the lowest performers, to obtain the Monthly Momentum Factor (MOM) "Carhart, 1997". A stock is deemed to have momentum if its prior 12-month average returns were positive or greater. Similar to the three factor approach, the momentum factor is described as a self-financing portfolio of (long positive momentum) + (short negative momentum). The financial markets continue to favour momentum methods. The 52-week high/low is

frequently taken into account by financial experts when making Buy/Sell recommendations.

#### **5. Fama- French Five Factor model**

The "three-factor model" was found to be insufficient for estimating expected returns because its three factors largely ignore the variation in average returns related to profitability and investment "(Fama and French, 2016)". As a result, the "Fama-French five-factor model", which added two factors, profitability and investment, was created. Explaining average returns on portfolios constructed to achieve wide spreads in size, B/M, profitability, and investment is the goal of empirical study on the "Fama French models". When profitability and investment factors are taken into account, the equation for the "five-factor model" time series regression is as follows:

$$r = r_f + \beta_1 (r_m - r_f) + \beta_2 (SMB) + \beta_3 (HML) + \beta_4 (RMW) + \beta_5 (CMA) + \epsilon$$

Where

- "The expected rate of return is  $r$ , while the risk-free rate is  $r_f$ ".
- "SMB is the return spread of small minus large stocks (i.e., the size impact)"
- " $R_m - R_f$  is the return spread between the capitalization-weighted stock market and cash".
- "RMW is the return spread of the most profitable firms minus the least profitable"
- "HML is the return spread of cheap stocks minus costly stocks (i.e., the value effect). HML is the return spread of cheap minus expensive stocks".
- Asness (2014) defined "CMA" as the difference in return between businesses that spend prudently and aggressively.

#### **Discussion and Conclusion**

At first, investors' primary investment alternatives were the equity and bond markets; nevertheless, the financialization of commodity investments has compelled investors to include commodities in their portfolios. The commodity market's nature and behaviour, however, have changed as a result of this phenomenon. Because of this, markets are quite erratic, and market participants now have serious worries about how to manage pricing risk. Asset pricing models play a vital role in managing risk, price discovery, and pricing of various financial assets. They are used for many different things, including, but not limited to, estimating the cost of capital for firms, evaluating managed portfolio performance, and testing the informational effectiveness of asset markets. The most important issue in financial economics is how to value a financial asset, particularly how to determine the value of a risky financial asset. This study's main goal is to analyze the theoretical underpinnings of asset pricing models and discuss how they affect securities analysis. Additionally, this study provides a thorough theoretical analysis of "asset pricing" models, focusing on static and dynamic versions in accordance with their empirical investigations. The idea of asset pricing and its ramifications are covered in a sizable quantity of financial economics literature. The work offers a theoretical derivation of the "capital asset pricing model" (CAPM), a common name for the equilibrium model. This model was created almost simultaneously by Sharpe (1964) and

Treynor (1961), and it has since been expanded and clarified by Lintner (1965), Mossin (1966), and Black (1972). Variations in expected return over time are common in securities and logically related to market circumstances. As a result, the static CAPM is converted into the “conditional capital asset pricing model” (CCAPM), a modified version of the “asset-pricing” model. The “arbitrage asset pricing theory” (APT), an alternative equilibrium asset-pricing model, was developed by Ross in 1976. The core ideas behind the arbitrage prong theory are also explored, along with the empirical literature assessment and critical evaluation of the theoretical and empirical models. Additionally, the “Cahart four factor model”, the “Fama French five factor model”, and the “Fama French three factor” model are discussed in this study. The primary objective of an “asset pricing” model is to determine the current value of future rewards or cash flows after taking risk and time lags into account. While the theoretical framework is still helpful to include the changing components in asset price models, the difficulty with the discounting process is that the crucial variables that influence pay offs change over time. By providing a thorough analysis of the models and analyzing the historical stream of empirical research in the form of a comprehensive factual review, this article solves a gap in the literature. These have implications that aid investors in lowering systematic risk, price discovery, and risk administration of financial assets. This would also assist the policy maker in formulating better changes to increase the efficiency and liquidity of the commodity market trading platform.

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