Analysis of Returns on Stocks in Nifty-50 Index using Capital Asset Pricing Model

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ABSTRACT

The purpose of this research study was to estimate the actual returns of the stocks in the NIFTY 50 index and analyze stock returns using the Capital Asset Pricing Model (CAPM) to understand if the stocks were undervalued or overvalued according to CAPM. The nature of this study is empirical and analytical. The data are collected from secondary sources, which include research publications from journals available in print and websites. The Indian economy's 23 sectors are represented by the 50 stocks that make up the Nifty 50; hence, it was chosen for the current study because it is much more stable than other Indian indices. The monthly closing prices of stocks over 5 years, from January 2018 to January 2023, are taken into consideration for the analysis. It was found that out of 50 stocks, 26 were undervalued and 24 were overvalued.

Keywords: Assets pricing; CAPM; Risk-return analysis; Beta; Market risk.

1.0 Introduction

A unique model known as the capital asset pricing model or CAPM, is one of the fundamental models for asset pricing. The expected returns for security are calculated using the CAPM model. The risk-free returns and the addition of beta can be used to compare the same. This research study's main goal is to use the Capital Asset Pricing Model (CAPM) to analyze stock returns. The CAPM provided the first logical framework for addressing this issue. Markowitz, (1952) laid the groundwork for the CAPM (Capital Asset Pricing Model) Later, Sharpe (1964), Treynor, (1961), Mossin (1966), and Lintner (1965) further developed the work of Markowitz.

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It is one of the valuation models used to determine the expected stock return for specific companies. Investors in the Indian stock market use it frequently. The main objectives of this study are to understand the risk-return relationship for individual shares in the Nifty-50 index and to assess the applicability and utility of CAPM in Nifty-50 stocks.

1.1 Rationale of the study

A model for forecasting expected returns on risky assets at their equilibrium is the CAPM. In 1952, Harry Markowitz laid the foundation for modern portfolio management. This idea was developed by William Sharpe, John Lintner, and Jan Mossion in an essay that was published in 1964. The fundamental tenet of this strategy is that we make sure that everyone has the same expectations.

In recent decades, building and publishing models regarding stock price behaviour in the capital markets has attracted the attention of economists, statisticians, and financial experts in particular. Modern investment management techniques and tools are being applied more frequently in an effort to outperform the market benchmark as a result of this intense interest. The Capital Assets Pricing Model (CAPM) is tested in this study to see if it holds true in the Indian stock market using the test for the slope for the standard form of CAPM. Capital markets are currently receiving greater attention and interest than ever before. It is safer and more transparent to make gains in today's wellregulated market, which has increased the scope for suitable securities appraisal. For investors, managers, analysts, and management experts, accurate stock valuation is essential. They are engaged in the evaluation of businesses and the search for undervalued stocks. To maximize shareholder wealth, top management has always relied on accurate stock valuations. Numerous parties are interested in learning the Nifty 50 stock's value using various valuation models. The Capital Asset Pricing Model (CAPM) serves as a model for risky securities and explains the connection between risk and expected return. It establishes a benchmark for assessing various investments and examines the empirical validity of the CAPM model for the Indian capital market (NSE). The premise of CAPM is that not all risk has an impact on asset prices, and that risk can be spread out and held risk-free when combined with other investments.

1.2 Objectives of the study

The objectives of this study are to estimate the actual returns of stocks in the NIFTY 50 index, understand how the CAPM model is applied to analyze stock returns in the Nifty 50 index, and determine whether stocks are undervalued or overvalued to determine whether a stock is risky or less risky

2.0 Review of Literature

Fama & French (2004): This paper focuses on Asset pricing theory, which began with the development of William Sharpe and John Lintner's capital asset pricing model (CAPM) in 1964. (resulting in a Nobel Prize for Sharpe in 1990). Prior to their discovery, there were no asset pricing models built from the ground up with precise, testable predictions about risk and return, as well as the characteristics of tastes and investment possibilities. Even after 40 years, the CAPM is still frequently employed for tasks like estimating the performance of managed portfolios and evaluating the cost of equity capital for firms. It is one of the best-known models and frequently the sole asset pricing model included in MBA-level investment courses. People are drawn to the CAPM because of its compellingly appealing logic and intuitively pleasing predictions about how to gauge risk and about the relationship between expected return and risk. Regrettably, the model's empirical performance is subpar—so subpar as to render its usage in applications invalid—possibly as a result of its simplicity. The empirical problems with the model can be a symptom of deeper problems. (After all, it's only a model.) These could also be a result of the constraints of the empirical tests, specifically the use of inferior replacements for the market portfolio of invested money, which is essential to the model's projections.

Bod'a & Kanderová (2014) state that The Capital Asset Pricing Model (CAPM), as originally considered and created by William Sharpe and John Lintner, examines its empirical validity. The CAPM is one of the fundamental components of modern portfolio theory, and as such, it is based on a number of solid theoretical presumptions about how investors and financial markets behave. As a result, this model establishes a linear relationship between market portfolio returns above the riskless rate and returns on risky assets that are above that rate. Its conclusions are significant, and one could argue that its functional relationship is constrictive. The CAPM is thus contested on a number of fronts by both theorists and practitioners. With regard to recent data, this empirical study reviews the linear functional form of the CAPM's empirical validity.

Rossi (2016), states in this paper the association between an investment's risk and anticipated return. The Capital Asset Pricing Model (CAPM) is an initial framework for assessing the risk return characteristics of financial assets. The advent of asset pricing theory can be traced to the CAPM (Sharpe, 1964; Lintner, 1965). The foundation of this model is the notion that not all risk ought to influence asset prices. Thus, the model sheds light on the type of risk that is correlated with return. The CAPM is still extensively utilized in applications after four decades. The CAPM offers a method for converting estimates of expected ROE to risks. Many academics have argued that the

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CAPM is based on irrational assumptions, which is why they disagree with its application. The main concepts of the CAPM, the history of empirical research on the CAPM, and the implications of this research on the drawbacks of the CAPM are all laid out in this paper.

Sathyanarayana & Harish (2017): This paper focuses on the consistency of beta in the Indian stock market, with special reference to the NSE Nifty 50 stocks. The methodology used to calculate the value of beta as well as the various methods used to assess the stability of betas are briefly discussed in the paper. The discussion of the results obtained is then continued, and a conclusion is provided by comparing the results with potential supporting data. The purpose of the paper was to investigate any unidentified breaks in the computed beta series, determine whether there is any structural break in the computed beta series with reference to the subprime crisis of 2008, and analyze the behavior and stability of beta across stocks listed in the CNX Nifty 50. The daily data from April 1, 2000, to March 31, 2015, has been gathered from the Capitaline database to be analyzed. Five portfolios of ten companies each have been built based on their market capitalization. The paper comes to the conclusion that most of the companies in the 50 stocks used for the study that are listed on the CNX Nifty 50 have stable betas. Additionally, we don't notice any trends in the stability of betas relative to portfolios.

Chakraborty & Patel (2018) used the Sharpe Single Index Model to build an ideal portfolio for the Indian market, taking into consideration stocks in the Nifty 50 Index. Secondary data were used to determine the risk and return for each stock included in the portfolio, and only 24 of the 50 stocks were selected to be included in the optimal portfolio. According to the paper, only 24 stocks fully satisfy the majority of the optimal portfolio requirements, which shows that the financial sector is expanding quickly and its stocks are delivering steady and assured gains.

Jethwani & Ramchandani (2020), in their paper, stated the application of the capital asset pricing model to the Nifty stocks. The paper's goal was to examine the use of and analysis of the CAPM (Capital Asset Pricing Model) in the Indian stock market, with a focus on 31 stocks from the Nifty-50 index (the index of the NSE, the National Stock Exchange). For the survey, the closing prices of 31 Nifty 50 stocks for the seven-year period between January 1, 2006, and December 31, 2012, were downloaded from the NSE (National Stock Exchange) website. Using CAPM, this study examines the impact of excess return on the market portfolio (Capital Asset Pricing Model). The study also focuses on the impact of the adjusted closing price on Stock Volatility. The CAPM results indicate that Excess Return on Market Portfolio (R_m - R_f) has a significant impact

on Excess Stock Return for all 31 Stocks ($R_i - R_f$). As a result, the Excess Return on the market portfolio is still a crucial and relevant parameter for the Excess Stock Return.

Talwar & Gopinathan (2022), The Capital Asset Pricing Model (CAPM) is one of the most widely accepted techniques for assessing stock returns. It helps to comprehend the risk-return relationship and the pricing of risky securities. Learning how to manage portfolio risk based on CAPM with the highest return at the same level of risk is the key goal. The major goal of this research was to examine which stocks were overpriced and underpriced, as well as which performed better than other portfolios. The findings showed that the Capital Asset Pricing Model (CAPM) supported a linear structure and was a useful model for explaining securities returns and assisting investors in making more informed investment decisions.

3.0 Research Methodology

The nature of this study is empirical. A class of research techniques known as empirical research methods involves gathering data in order to address research questions. The study is a methodical, scientific investigation of the managerial aspects, including the process of problem identification, data gathering, analysis, and interpretation.

The information was gathered from a secondary source. Secondary data collection techniques were used to gather information from a variety of journals, websites, and research papers that have previously been published and are available online and in printed sources.

The 50 firms that make up the strong, diverse Nifty 50 index represent the 23 sectors of the Indian economy. It is the most popular personal financial instrument in India. The Nifty 50 Index was chosen for the current study because it is much more stable than other Indian indices. The monthly closing prices of stocks over a period of 5 years, from January 2018 to January 2023, are taken into consideration for the analysis. The NSE website provided the monthly statistics.

4.0 Data Analysis and Results

4.1 Statistical tools

a. Rate of return: Rate of return on a stock is computed using the formula below:

$$r_{i} = \frac{P_{t} - P_{t-1}}{P_{t-1}}$$

 \mathbf{r}_i is the % rate of return of stock for one month, \mathbf{P}_t is the closing price of the stock for the current month, and \mathbf{P}_{t-1} is the closing price of the stock for the previous month.

b. Average return: The expected average rate of return of a stock is computed using the arithmetic mean.

$$E(R_i) = \frac{\sum r_t}{n}$$

 $E(\mathbf{r})$ is the expected average return on a stock, \mathbf{r}_t is the % rate of return of a stock for one month, \mathbf{n} is the number of months

c. Annual return: The annual returns of stocks are given by $E(R_p) = (1 + E(R)_i)^{12-1}$

d. Annual risk

The annual Standard deviation of stock returns is given by

$$\sigma_{\text{annual}} = \sigma * \sqrt{12}$$

e. Expected returns of stock: The expected returns of portfolio are as follows:

 $(R_i) = R_f + \beta (R_m - R_f)$

Where:

 \mathbf{R}_{f} is Risk free rate of return \mathbf{R}_{m} is return on market $\boldsymbol{\beta}$ is the risk associated with the particular assets

4.2 Risk-free rate

The return on a security (or portfolio of securities) with no default risk and no correlation to other economic indicators is known as the risk-free rate (R_f). The gain on a portfolio with zero beta is, hypothetically, the best estimate of the risk-free rate. However, building zero-beta portfolios is expensive and difficult. In actuality, two options are frequently employed: the interest rate, which applies to short-term government securities like 91-day Treasury Bills, and each of the aforementioned two options has benefits and drawbacks. But the information used for our research report is based on 91-day Treasury bills for a 5-year period beginning in 2018 and ending in 2022.

4.3 Return on market

The expected rate of return on the market portfolio is represented by (R_m) . The expected rate of return on Nifty 50 is utilized as the return on market portfolio in this research study.

4.4 Market risk premium

The discrepancy between the risk-free rate and the anticipated return on a market portfolio is known as the market risk premium. The market risk premium offers a quantitative representation of the added return that market participants demand in exchange for the elevated risk.

The formula, which is used to express the market risk premium,

Market Risk Premium = Expected Rate of Return on Market (R_m) – Risk-Free Rate (Rf)

4.5 Beta (β)

Pricing of capital assets Model beta is used to quantify the security's overall risk. The relationship between systematic risk and expected returns for assets and stocks is described by the beta. The CAPM is a widely used technique for valuing risky securities and estimating expected asset returns.

4.6 Estimating of beta β

• If Beta of more than one indicates that the stock is riskier. If Beta of less than one indicates that the stock is less risky.

4.7 Valuation of securities

- If Expected Returns are < CAPM Returns securities are Overvalued
- If Expected Returns are > CAPM Returns securities are Undervalued

Sample Calculation of NIFTY 50 and Indus Bank LTD. returns calculation for the five-year period between January 1, 2018, and November 31, 2022 (Table 1).

Table 1: Returns Calculation for the Five-year Period between January 1, 2018,and November 31, 2022

Date	Nifty 50	Returns	INBK	Returns
01-01-2018	11,027.70		1753.1	
02-01-2018	10,492.85	-4.85%	1680.75	-4.13%
03-01-2018	10,113.70	-3.61%	1796.75	6.90%
04-01-2018	10,739.35	6.19%	1898	5.64%
05-01-2018	10,736.15	-0.03%	1955.45	3.03%
06-01-2018	10,714.30	-0.20%	1932.2	-1.19%
07-01-2018	11,356.50	5.99%	1995.15	3.26%
08-01-2018	11,680.50	2.85%	1906.6	-4.44%

09-01-2018	10,930.45	-6.42%	1690.05	-11.36%
10-01-2018	10,386.60	-4.98%	1425.1	-15.68%
11-01-2018	10,876.75	4.72%	1631.8	14.50%
12-01-2018	10,862.55	-0.13%	1599.3	-1.99%
01-01-2019	10,830.95	-0.29%	1505.55	-5.86%
02-01-2019	10,792.50	-0.36%	1473.85	-2.11%
03-01-2019	11,623.90	7.70%	1780	20.77%
04-01-2019	11,748.15	1.07%	1606.5	-9.75%
05-01-2019	11,922.80	1.49%	1605.35	-0.07%
06-01-2019	11,788.85	-1.12%	1410.5	-12.14%
07-01-2019	11,118.00	-5.69%	1412.85	0.17%
08-01-2019	11,023.25	-0.85%	1395.75	-1.21%
09-01-2019	11,474.45	4.09%	1383.55	-0.87%
10-01-2019	11,877.45	3.51%	1313.2	-5.08%
11-01-2019	12,056.05	1.50%	1569.1	19.49%
12-01-2019	12,168.45	0.93%	1510	-3.77%
01-01-2020	11,962.10	-1.70%	1258.85	-16.63%
02-01-2020	11,201.75	-6.36%	1104.05	-12.30%
03-01-2020	8,597.75	-23.25%	351.3	-68.18%
04-01-2020	9,859.90	14.68%	468.15	33.26%
05-01-2020	9,580.30	-2.84%	393.65	-15.91%
06-01-2020	10,302.10	7.53%	474.8	20.61%
07-01-2020	11,073.45	7.49%	523.75	10.31%
08-01-2020	11,387.50	2.84%	630.2	20.32%
09-01-2020	11,247.55	-1.23%	527.4	-16.31%
10-01-2020	11,642.40	3.51%	585.7	11.05%
11-01-2020	12,968.95	11.39%	857.65	46.43%
12-01-2020	13,981.75	7.81%	894.95	4.35%
01-01-2021	13,634.60	-2.48%	846.1	-5.46%
02-01-2021	14,529.15	6.56%	1062.95	25.63%
03-01-2021	14,690.70	1.11%	954.45	-10.21%
04-01-2021	14,631.10	-0.41%	934.95	-2.04%
05-01-2021	15,582.80	6.50%	1013	8.35%
06-01-2021	15,721.50	0.89%	1016.35	0.33%
07-01-2021	15,763.05	0.26%	981	-3.48%
08-01-2021	17,132.20	8.69%	992.4	1.16%

09-01-2021	17,618.15	2.84%	1111.9	12.04%
10-01-2021	17,671.65	0.30%	1140.2	2.55%
11-01-2021	16,983.20	-3.90%	883	-22.56%
12-01-2021	17,354.05	2.18%	888.15	0.58%
01-01-2022	17,339.85	-0.08%	872.1	-1.81%
02-01-2022	16,793.90	-3.15%	920.7	5.57%
03-01-2022	17,464.75	3.99%	935.4	1.60%
04-01-2022	17,102.55	-2.07%	978.55	4.61%
05-01-2022	16,584.55	-3.03%	930.85	-4.87%
06-01-2022	15,780.25	-4.85%	794.35	-14.66%
07-01-2022	17,158.25	8.73%	1043.5	31.37%
08-01-2022	17,759.30	3.50%	1107.45	6.13%
09-01-2022	17,094.35	-3.74%	1185.2	7.02%
10-01-2022	18,012.20	5.37%	1142.65	-3.59%
11-01-2022	18,758.35	4.14%	1167.8	2.20%

Source: nseindia.com & calculation

Calculation of Indus Bank Risk and Average returns calculation for the five-year period between January 1, 2018, and November 31, 2022 (Table 2).

Table 2: Returns Calculation for the Five-year Period between January 1, 2018,and November 31, 2022

	NIFTY	IDBK
Monthly Average Return	1.08%	0.89%
Annual Average Return	13.8%	11.21%
Monthly Risk	5.59%	15.91%
Annual Risk	19.35%	55.12%
	β	2.32
	α	-0.016
	RF	4.91%
	САРМ	38.3%

Source: Calculation

Calculation of Beta for NSE (Nifty-50) Companies, Total risk Actual Return, CAPM Return and Valuation of Securities for the period of 5 years i.e., from 01- 01- 2018 to 31-11-2022 (Table 3).

Stocks in	Average	Average	Monthly	Annal	Beta	Market	Risk free	CAPM	Stock
Nifty-50	Monthly	Annual	Risk	Risk	(β)	Returns	returns	Returns	Valuat
	Returns	Returns				(Km)	(KI)	(KI)	10n
IndusInd Bank Ltd	0.89%	11.21%	15.91%	55.12%	2.32	13.8%	4.91%	38.3%	Under Valued
Bajaj Finserv	3.18%	45.57%	14.45%	50.05%	1.94	13.8%	4.91%	32.9%	Over Valued
Bajaj Finance Ltd	3.46%	50.41%	14.11%	48.88%	1.88	13.8%	4.91%	32.1%	Over Valued
Tata Motors	1.63%	21.40%	17.52%	60.71%	1.79	13.8%	4.91%	30.8%	Under Valued
Hindalco Industries	1.89%	25.19%	13.74%	47.60%	1.79	13.8%	4.91%	30.7%	Under Valued
Adani Enterprises Ltd	7.56%	139.88%	19.12%	66.24%	1.63	13.8%	4.91%	28.4%	Over Valued
AXIS Bank Ltd	1.38%	17.85%	10.81%	37.45%	1.56	13.8%	4.91%	27.4%	Under Valued
Tata Steel Ltd	1.52%	19.78%	12.61%	43.68%	1.48	13.8%	4.91%	26.3%	Under Valued
SBI	1.81%	23.97%	11.60%	40.19%	1.40	13.8%	4.91%	25.2%	Under Valued
Mahindra & Mahindra	1.54%	20.10%	10.75%	37.22%	1.37	13.8%	4.91%	24.7%	Under Valued
ICICI Bank	2.19%	29.73%	9.38%	32.50%	1.30	13.8%	4.91%	23.7%	Over Valued
Adani Ports & SEZ	1.75%	23.08%	10.03%	34.74%	1.28	13.8%	4.91%	23.4%	Under Valued
JSW Steel	2.43%	33.46%	12.76%	44.20%	1.28	13.8%	4.91%	23.4%	Over Valued
UPL	1.42%	18.49%	11.17%	38.69%	1.27	13.8%	4.91%	23.2%	Under Valued
Bharat Petroleum	0.02%	0.29%	10.26%	35.54%	1.25	13.8%	4.91%	23.0%	Under Valued
Larsen & Toubro	1.06%	13.43%	8.32%	28.82%	1.17	13.8%	4.91%	21.8%	Under Valued
Oil & Natural Gas	-0.11%	-1.29%	10.22%	35.40%	1.14	13.8%	4.91%	21.4%	Under Valued
Housing Development Finance	0.85%	10.74%	7.69%	26.64%	1.14	13.8%	4.91%	21.3%	Under Valued

Table 3: Calculation of Beta for NSE (Nifty-50) Companies

HDFC Bank	1.09%	13.89%	7.27%	25.17%	1.09	13.8%	4.91%	20.7%	Valued
Reliance Industries	2.21%	30.01%	8.91%	30.87%	1.07	13.8%	4.91%	20.3%	Over Valued
Maruti Suzuki	0.32%	3.91%	8.96%	31.03%	1.05	13.8%	4.91%	20.1%	Under Valued
Grasim Industries	1.17%	14.93%	9.16%	31.74%	1.05	13.8%	4.91%	20.1%	Under Valued
Bajaj Auto	0.56%	6.99%	8.43%	29.20%	1.03	13.8%	4.91%	19.8%	Under Valued
Titan Company	2.36%	32.37%	9.07%	31.41%	1.01	13.8%	4.91%	19.5%	Over Valued
UltraTech Cement	1.16%	14.90%	8.14%	28.18%	0.96	13.8%	4.91%	18.8%	Under Valued
Kotak Mahindra Bank Ltd	1.29%	16.69%	8.07%	27.95%	0.94	13.8%	4.91%	18.4%	Under Valued
SBI Life Insurance	1.52%	19.81%	8.32%	28.82%	0.93	13.8%	4.91%	18.3%	Over Valued
Eicher Motors	0.88%	11.05%	9.27%	32.11%	0.93	13.8%	4.91%	18.3%	Under Valued
Hero MotoCorp	-0.05%	-0.58%	8.89%	30.80%	0.91	13.8%	4.91%	18.1%	Under Valued
Apollo Hospitals	3.17%	45.50%	12.14%	42.05%	0.90	13.8%	4.91%	18.0%	Over Valued
Tata Consumer Products	2.15%	29.12%	8.58%	29.74%	0.85	13.8%	4.91%	17.2%	Over Valued
Coal India	-0.07%	-0.80%	9.08%	31.46%	0.85	13.8%	4.91%	17.1%	Under Valued
HCL Tech	1.81%	24.00%	8.64%	29.94%	0.84	13.8%	4.91%	17.1%	Over Valued
HDFC Life	0.85%	10.74%	7.60%	26.32%	0.83	13.8%	4.91%	16.9%	Under Valued
Tech Mahindra	1.45%	18.89%	8.88%	30.76%	0.81	13.8%	4.91%	16.5%	Over Valued
NTPC	0.67%	8.28%	8.20%	28.42%	0.77	13.8%	4.91%	16.0%	Under Valued
Sun Pharma	1.40%	18.11%	8.83%	30.59%	0.73	13.8%	4.91%	15.4%	Over Valued
ITC	0.61%	7.55%	6.65%	23.03%	0.72	13.8%	4.91%	15.3%	Under Valued
Bharti Airtel	1.60%	20.92%	7.39%	25.59%	0.65	13.8%	4.91%	14.4%	Over Valued

Infosys	2.12%	28.65%	7.61%	26.38%	0.63	13.8%	4.91%	14.0%	Over Valued
Britannia Industries	1.32%	17.04%	6.95%	24.08%	0.61	13.8%	4.91%	13.8%	Over Valued
Asian Paints	2.07%	27.92%	7.58%	26.27%	0.59	13.8%	4.91%	13.5%	Over Valued
Tata Consultancy	1.63%	21.44%	7.06%	24.45%	0.58	13.8%	4.91%	13.3%	Over Valued
Power Grid	0.95%	12.03%	6.00%	20.77%	0.53	13.8%	4.91%	12.5%	Under Valued
Wipro	1.35%	17.45%	8.48%	29.37%	0.45	13.8%	4.91%	11.4%	Over Valued
Cipla	1.48%	19.21%	8.44%	29.23%	0.43	13.8%	4.91%	11.1%	Over Valued
Divi's Labs	2.37%	32.43%	7.76%	26.87%	0.42	13.8%	4.91%	11.0%	Over Valued
Nestle India	1.91%	25.53%	5.62%	19.45%	0.33	13.8%	4.91%	9.6%	Over Valued

6.43%

7.73%

Source: Authors calculation

1.38%

1.50%

17.81%

19.59%

Hindustan

Unilever

Dr. Reddy's

Labs

The Nifty 50 stocks that are overvalued and undervalued based on the capital asset pricing model are highlighted in Table No. 3 above. Stocks that have annual returns greater than those determined by the CAPM are undervalued, while those that have annual returns lower than those determined by the CAPM are overvalued. Stocks with values above the beta value carry more risk, while those with values below the beta value carry less risk. Stocks that are overvalued in the market may be recommended for sale, while undervalued stocks may be recommended for purchase in order to provide investors with a higher rate of return.

22.29% 0.23

0.22

26.77%

13.8%

13.8%

4.91%

4.91%

Over

Valued

Over

Valued

8.3%

8.1%

Table 4 highlights the stocks of Nifty-50 which are overvalued, as compared with the returns obtained as per CAPM.

The stocks that are overvalued according to the CAPM are all represented in Table 4. By contrasting the stocks' actual returns with the returns obtained by the CAPM, it can be determined that the stocks are overvalued. The price of these stocks is overvalued in the market, which means there is good demand for these stocks in the market.

Stocks in Nifty-50	Average Annual	Annual	BETA	САРМ	Stock
Stocks in Mity-50	Returns	Risk	(β)	Returns (Ri)	Valuation
Bajaj Finserv	45.57%	50.05%	1.94	32.9%	Over Valued
Bajaj Finance Ltd	50.41%	48.88%	1.88	32.1%	Over Valued
Adani Enterprises Ltd	139.88%	66.24%	1.63	28.4%	Over Valued
ICICI Bank	29.73%	32.50%	1.30	23.7%	Over Valued
JSW Steel	33.46%	44.20%	1.28	23.4%	Over Valued
Reliance Industries	30.01%	30.87%	1.07	20.3%	Over Valued
Titan Company	32.37%	31.41%	1.01	19.5%	Over Valued
SBI Life Insurance	19.81%	28.82%	0.93	18.3%	Over Valued
Apollo Hospitals	45.50%	42.05%	0.90	18.0%	Over Valued
Tata Consumer Products	29.12%	29.74%	0.85	17.2%	Over Valued
HCL Tech	24.00%	29.94%	0.84	17.1%	Over Valued
Tech Mahindra	18.89%	30.76%	0.81	16.5%	Over Valued
Sun Pharma	18.11%	30.59%	0.73	15.4%	Over Valued
Bharti Airtel	20.92%	25.59%	0.65	14.4%	Over Valued
Infosys	28.65%	26.38%	0.63	14.0%	Over Valued
Britannia Industries	17.04%	24.08%	0.61	13.8%	Over Valued
Asian Paints	27.92%	26.27%	0.59	13.5%	Over Valued
Tata Consultancy	21.44%	24.45%	0.58	13.3%	Over Valued
Wipro	17.45%	29.37%	0.45	11.4%	Over Valued
Cipla	19.21%	29.23%	0.43	11.1%	Over Valued
Divi's Labs	32.43%	26.87%	0.42	11.0%	Over Valued
Nestle India	25.53%	19.45%	0.33	9.6%	Over Valued
Hindustan Unilever	17.81%	22.29%	0.23	8.3%	Over Valued
Dr. Reddy's Labs	19.59%	26.77%	0.22	8.1%	Over Valued

Table 4: The Stocks of Nifty-50 Which are Overvalued

Source: Calculations

Table 5 highlights the stocks of Nifty-50 which are Overvalued, as compared with the returns obtained as per CAPM.

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Table 5: The Stocks of Nifty-50 Which are Overvalued, as Compared with theReturns Obtained as per CAPM

Stocks in Nifty 50	Average Annual Returns	CAPM Returns (Ri)
Bajaj Finserv	45.57%	32.9%
Bajaj Finance Ltd	50.41%	32.1%
Adani Enterprises Ltd	139.88%	28.4%
ICICI Bank	29.73%	23.7%
JSW Steel	33.46%	23.4%

Source: Calculations





4.8 Interpretation

We can infer from Figure 1 that Bajaj Finserv, Bajaj Finance Ltd., Adani Enterprises Ltd., ICICI Bank, and JSW Steels are the five stocks that are overvalued among the other stocks, indicating that these stocks can be recommended for an investor to sell first in the market because they can provide maximum returns.

Table 6 highlights the stocks of Nifty-50 which are undervalued, as compared with the returns obtained as per CAPM.

Stoolyg in Nifty 50	Average Annual	Annual	BETA	САРМ	Stock
Stocks in Milly-50	Returns	Risk	(β)	Returns (Ri)	Valuation
Adani Ports & SEZ	23.08%	34.74%	1.28	23.4%	Under Valued
AXIS Bank Ltd	17.85%	37.45%	1.56	27.4%	Under Valued
Bajaj Auto	6.99%	29.20%	1.03	19.8%	Under Valued
Bharat Petroleum	0.29%	35.54%	1.25	23.0%	Under Valued
Coal India	-0.80%	31.46%	0.85	17.1%	Under Valued
Eicher Motors	11.05%	32.11%	0.93	18.3%	Under Valued
Grasim Industries	14.93%	31.74%	1.05	20.1%	Under Valued
HDFC Bank	13.89%	25.17%	1.09	20.7%	Under Valued
HDFC Life	10.74%	26.32%	0.83	16.9%	Under Valued
Hero MotoCorp	-0.58%	30.80%	0.91	18.1%	Under Valued
Hindalco Industries	25.19%	47.60%	1.79	30.7%	Under Valued
Housing Development Finance	10.74%	26.64%	1.14	21.3%	Under Valued
IndusInd Bank Ltd	11.21%	55.12%	2.32	38.3%	Under Valued
ITC	7.55%	23.03%	0.72	15.3%	Under Valued
Kotak Mahindra Bank Ltd	16.69%	27.95%	0.94	18.4%	Under Valued
Larsen & Toubro	13.43%	28.82%	1.17	21.8%	Under Valued
NTPC	8.28%	28.42%	0.77	16.0%	Under Valued
Mahindra & Mahindra	20.10%	37.22%	1.37	24.7%	Under Valued
Maruti Suzuki	3.91%	31.03%	1.05	20.1%	Under Valued
Oil & Natural Gas	-1.29%	35.40%	1.14	21.4%	Under Valued
Power Grid	12.03%	20.77%	0.53	12.5%	Under Valued
SBI	23.97%	40.19%	1.40	25.2%	Under Valued
Tata Motors	21.40%	60.71%	1.79	30.8%	Under Valued
Tata Steel Ltd	19.78%	43.68%	1.48	26.3%	Under Valued
UltraTech Cement	14.90%	28.18%	0.96	18.8%	Under Valued
UPL	18.49%	38.69%	1.27	23.2%	Under Valued

Table 6: The Stocks of Nifty-50 Which are Undervalued

Source: Calculations

All of the stocks that are undervalued according to the CAPM are listed in Table 6. By contrasting the stocks' actual returns with the returns obtained by the CAPM, it can be determined that the stocks are undervalued.

Table 7 highlights the stocks of Nifty-50 which are Undervalued, as compared with the returns obtained as per CAPM.

Table 7: The Stocks of Nifty-50 Which are Undervalued, as Compared with the Returns Obtained as per CAPM

Stocks in Nifty-50	Average Annual Returns	CAPM Returns (Ri)
IndusInd Bank Ltd	11.21%	38.3%
Tata Motors	21.40%	30.8%
Hindalco Industries	25.19%	30.7%
AXIS Bank Ltd	17.85%	27.4%
Tata Steel Ltd	19.78%	26.3%

Source: Calculations

Figure 2: Comparison of Actual Returns and Returns as per CAPM



We can conclude from Figure 2 that the top five undervalued stocks to buy are IndusInd Bank Ltd., Tata Motors, Hindalco Industries, AXIS Bank Ltd., and Tata Steel Ltd. because they have the potential to generate the highest returns in the future and have lower risks than the other stocks.

5.0 Results

Out of the 50 stocks under consideration for the analysis, 26 are found to be undervalued and 24 are overvalued. The findings of the study show that stocks with annual returns that are less than those determined by the CAPM are overvalued. Additionally, undervalued stocks are those whose annual returns exceed those determined by the Capital Asset Pricing Model. Stocks with a beta value greater than one are comparably riskier than other stocks. According to the study, Indusland Bank stock has a beta value of 2.32, which is greater than one, making it the riskiest investment relative to the other stocks in the Nifty-50 Index. Majority of stocks are found to have beta values below 1, making them defensive securities. Risk-averse shareholders may decide to invest in these kinds of stocks. Although riskier, shares with beta values greater than one provide their owners with large returns.

Indusland Bank, Hindalco Industries, Tata Motors, and AXIS Bank are the companies that have a beta value greater than one, making them extremely hazardous in the market but also provide higher rewards. Another finding from the study is that stocks with beta values less than one are often considered to be less risky than other stocks. The stock of Dr. Reddy's Labs Company has a beta value of 0.22, which is less than one, making it the least risky share among all the other components of the Nifty 50 index. In general, the CAPM is among the best models for determining the risk and return attached to a certain stock. The five stocks that stand out as being overvalued among the rest are Cipla, Divi's Labs, Nestle India, Hindustan Unilever, and Dr. Reddy's Labs. It is advised that investors sell these stocks first so they can receive the most profits. The top five undervalued stocks that can be purchased are IndusInd Bank Ltd., Tata Motors, Hindalco Industries, AXIS Bank Ltd., and Tata Steel Ltd. These companies can offer the highest returns in the future and carry less risk than other stocks.

6.0 Limitations & Future Scope of Work

The scope of this research is limited to the 50 stocks that make up the NIFTY Index. The period of study is taken as five years, from January 2018 to January 2023. The closing prices of the 50 companies that make up the NIFTY 50 Index are used to determine the monthly risk and returns of the stocks. In the future, other stocks belonging to different indices can be used. The stability of Beta can be tested.

7.0 Recommendations

Nifty 50 is a diverse index that encompasses 23 economic sectors in India. The CAPM model assesses whether the shares are undervalued or overvalued. Shares are overvalued when their actual price is higher than their CAPM returns, and they are undervalued when their actual price is lower. Thus, shares that are overvalued can be

sold, while shares that are undervalued can be purchased. Investors who have the capacity to take on risk and generate large returns are advised to purchase companies with beta values greater than 1 and investors who desire less or no risk and are comfortable with nominal returns are recommended to buy stocks whose beta values are less than 1. IndusInd Bank stock has a beta of 2.34, which is more than one; thus, it is a highly risky share compared to all the other stocks in the Nifty-50 index, which also give high returns. Thus, investors who are risk-takers are suggested to invest in this stock. Dr. Reddy's Labs Company stock has a beta value of 0.22, which is less than 1, making it the least risky share compared to all the other stocks in the Nifty 50 index. Investors who don't want to take on a lot of risk are advised to buy this stock.

8.0 Conclusion

Although the majority of the stocks assessed using the Capital Asset Pricing Model (CAPM) are undervalued, this means that these stocks should be bought from the current market, while the overpriced stocks can be sold to maximise profit and minimise loss. The study goes into great detail about both the subject and the Capital Asset Pricing Model. The findings of this study suggest that anyone interested in building a stock portfolio should evaluate the risk and return involved. Both current and potential investors who want to earn reliable returns in a secure environment will benefit greatly from using this concept. The study's findings appear to be in agreement with Sharpe (1964), Treynor (1961), Lintner (1965), and Mossin (1966) who developed the Capital Asset Pricing Model for evaluating the risk of the stocks. Participants should, however, exercise extreme caution when calculating the risk of any security. The CAPM and its more complex versions have been extensively used by investment managers. The CAPM is still widely used in corporate circles to determine the costs of equity for businesses. However, Tests of the model, show that it has a lot to say about how yields are set in financial markets. A novel and distinctive approach to a significant task is represented by CAPM.

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