

## Analysis Of Investment Decisions In Iron & Steel Company Using The Capital Asset Pricing Model (CAPM)

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Sumbitted : 2023-10-24 | Reviewed : 2023-12-07 | Accepted : 2023-12-10

**ABSTRACT**--The motive of this studies is to apply the Capital Asset Pricing version (CAPM) analysis approach to decide whether the final results are undervalued or hyped up, which will become a attention in making inventory invest ment choices. The variables used on this have a look at are corporations working within the Iron & metal industry. CAPM is a version used to estimate the returns acquired from unstable securities or as a benchmark for comparing the fee of return on investments. The standards for selection on this take a look at contain choosing efficient stocks in the Iron & metallic groups wherein man or woman returns are extra than the expected returns ( $R_i > E R_i$ ). The outcomes of this studies indicate that there are eight business enterprise stocks that fall below the category of efficient stocks, namely BTON, CTBN, GDST, GGRP, ISSP, KRAS, LMSH, OPMS. these shares have  $R_i > E R_i$  values, so the encouraged investment selection for buyers is to shop for efficient shares. based totally at the records analysis, there may be a non-linear courting among systematic danger and expected inventory returns.

**Keywords** : CAPM, investment choices, financial, evaluation

### INTRODUCTION

Funding is a very important hobby within the international of finance and enterprise. Sensible funding decisions may have a tremendous impact on the increase and sustainability of a organization or funding portfolio. one of the gear used to assist make investment selections is the Capital Asset Pricing model (CAPM), or in Indonesian referred to as the Capital Asset Valuation version (MPAM). This model provides steerage on how investors can pick out the right funding based on the extent of chance and predicted go back.

Using CAPM has end up a standard in monetary and funding analysis. This version changed into developed via William Sharpe in 1964 and has been widely used in numerous contexts, from stock valuation to asset allocation in investment portfolios.

Meanwhile, in line with Gitman et al (2012), CAPM is a mathematical function that could link systematic hazard with expected returns from overall property in an investor's portfolio. primarily based on this definition, it may be concluded that CAPM is a formula that may be used to calculate estimates for making funding decisions concerning a stock by using considering the inherent danger of a protection.1)

In the evaluation of investment decision making using CAPM, the primary goal is to evaluate whether a selected funding generates returns large enough to atone for the dangers inherent in it. An investment with an anticipated rate of go back better than the expected charge of go back based on the CAPM will be considered a profitable investment.

In this examine, we can overview more about using CAPM in funding selection making, masking extra in-intensity ideas, the calculations concerned, as well as case research that illustrate its use in actual-world situations. similarly, we are able to also speak the criticisms and barriers of this model. With a better knowledge of the CAPM, buyers and financial managers could make extra informed and better hazard-oriented investment selections.

APM pursuits to assist traders in deciding on shares and minimizing unstable investments. the use of CAPM is predicted to magazine of commercial enterprise administration assist traders to describe complex market conditions, in addition to reduce funding risks and estimate the amount of return acquired. Rational investors will select green stocks, namely shares which have an predicted return this is smaller than the real return. "efficient shares may be determined through deciding on a positive degree of anticipated return, then minimizing the hazard or minimizing a positive stage of danger, then maximizing the expected go back" (Tandelilin, 2010). Inefficient stocks are shares that must be averted because they've person returns which are small as compared to the expected return. CAPM also can assist investors calculate the chance that cannot be assorted in a portfolio and examine it with the predicted fee of return. the extent of threat and level of return are stated to have a fantastic and linear relationship. The threat measure that is an indicator of stock sensitivity inside the CAPM is shown by way of the variable  $\beta$  (Beta). The extra the  $\beta$  of a inventory, the extra the chance contained in it. The marketplace price of go back used is the common rate of return from investment opportunities inside the capital market (marketplace index). This studies changed into taken primarily based on facts to be had on the Indonesia inventory change (BEI), especially on stocks indexed on the Bisnis-27 index. The Bisnis-27 Index is a stock index formally launched with the aid of the Indonesia inventory exchange in collaboration with the Bisnis Indonesia every day which includes 27 enterprise shares. This studies aims to research the exceptional funding alternatives inside the Bisnis-27 Index shares on the Indonesia inventory exchange (BEI) in line with the Capital Asset Pricing model (CAPM) technique in terms of chance and return. based totally at the description above, the author is interested in carrying out studies with the title: evaluation of the Capital Asset Pricing version (CAPM) as a basis for stock funding selection Making (look at of enterprise Index-27 stocks at the Indonesia stock alternate). 2)

## **THEORETICAL BASIS**

While you make a decision about an investment, buyers are confronted with a situation to determine which investment option can offer the income the investor dreams. investment selections by using traders are influenced by the way investors manner the records they have. this is in accordance with the theory recommend with the aid of Markowitz (in Acharya and Pedersen, 2005), which explains that investors tend to pick out investments which might be maximum worthwhile for buyers and try to reduce risk through diversifying shares. This concept turned into developed through Treynor, Sharpe, Lintner and Mossin (in Acharya and Pedersen, 2005) that's called the Capital Asset Pricing model (CAPM) idea. This principle predicts predicted costs of go back and threat from investing in volatile assets. one of the assumptions underlying this concept is that traders are rational and have homogeneous expectancies, or a homogeneous manner of thinking in reading information. apart from that, the CAPM principle believes that the stock marketplace is efficient (efficient market hypothesis / EMH). The Capital Asset Pricing model (CAPM) was advanced through Treynor; Sharpe; Lintner and Mossin (in Acharya and Pedersen, 2005). This theory predicts the connection among threat and expected return from volatile property. The utility of CAPM concept to traders is based totally on numerous assumptions, specifically that buyers can not affect fees based totally on individual transactions. From the CAPM principle, it could be visible that the signs that an investor is asserted rational are first, the investor will recall all investment opportunities before he decides to buy a selected funding. second, every selection that has been taken via an investor will no longer be regretted by means of the investor inside the destiny, because in CAPM concept traders are of the rational kind. The CAPM idea on this studies is associated with traders' decisions to make stock investment decisions with the risks they'll face.3)

Theoretical Foundations The Capital Asset Pricing model (CAPM) is a economic version used to decide the level of go back that ought to be expected from an investment. This version gives the relationship among the predicted fee of go back from an asset or funding portfolio and the systematic danger faced by using that asset. underneath is a entire clarification of CAPM:

**a) green Capital market (efficient market hypothesis - EMH):**

1. CAPM assumes that capital markets are green, that means all to be had facts is contemplated in asset prices. In different phrases, traders are considered rational and there are not any threat-loose arbitrage possibilities.

**b) go back on belongings:**

1. danger-loose return ( $R_f$ ): that is the expected fee of return on a threat-free asset, such as a central authority bond.
2. market threat premium (RPM): that is the distinction among the overall market return (typically measured by a inventory index inclusive of the S&P 500) and the hazard-free charge of go back.

**c) Systematic risk (Systematic risk):**

1. Systematic risk is unavoidable danger, which originates from outside elements that have an effect on the entire market. In CAPM, systematic chance is measured the use of Beta ( $\beta$ ). Beta is a range of that reflects the sensitivity of an asset to changes within the normal marketplace.

**d) CAPM Equation:**

1. The CAPM equation relates the anticipated price of return of an asset to the subsequent additives:
2.  $[ E ( R_i ) = R_f + \beta_i ( R_m - R_f ) ]$
3.  $( E(R_i) )$  is the anticipated fee of go back at the i-th asset.
4.  $( R_f )$  is the threat-free price of go back.
5.  $( \beta_i )$  is the Beta of asset i.
6.  $( R_m )$  is the overall marketplace price of go back.
7.  $( R_m - R_f )$  is the market chance top rate.

**e) Interpretation of Beta ( $\beta$ ):**

- a. Beta measures the level of sensitivity of an asset to market changes. If  $( \beta_i = 1 )$ , then the asset has the identical stage of threat because the market. If  $( \beta_i > 1 )$ , the asset is riskier than the marketplace, and if  $( \beta_i < 1 )$ , the asset is less risky than the market.

**f) CAPM Disadvantages:**

- a. The assumption that markets are always efficient and there are no transaction costs does not always hold true in the real world.
- b. It assumes that beta is constant over time, which may not always be true.
- c. CAPM often cannot accurately predict changes in asset prices.

Although CAPM has some drawbacks, it remains a useful tool in evaluating investment risk and return, especially in the context of portfolio planning and investment decision making.

## RESEARCH METHODS

This research uses data on all shares listed on the Indonesia Stock Exchange, the data of which can be accessed via Yahoo Finance in the 2022-2023 period. The population in this study were 8 company shares listed on the Indonesian stock exchange. The sample selection in this research used a purposive sampling method with the following criteria:

- a. The company is listed on the Indonesian Stock Exchange.
- b. The companies selected operate in the Iron and Steel sector.
- c. Traded actively and fairly on the stock exchange. In this way, it can be ensured that the selected shares will never be suspended during the 2022-2023 period.
- d. Not at the minimum trading price of Rp. 50,- over a long period of time.

The table below shows the research population, namely companies registered on yahoofinance.com

Table 1. Stock Data

No	Code	Issuer Name	Sectors
1	BTON	PT. Beton Jaya Manunggal	Iron and Steel
2	CTBN	PT. Tubindo image	Iron and Steel
3	GDST	PT. Gunawan Dianjaya Steel	Iron and Steel
4	GGRP	PT. Mount Raja Paksi	Iron and Steel
5	ISSP	PT. Steel Pipe Industry of Indonesia	Iron and Steel
6	KRAS	PT. Krakatoa Steel	Iron and Steel
7	LMSH	PT. Lionmesh Prima	Iron and Steel
8	OPMS	PT. Optima Prima Metal Synergy	Iron and Steel

The analysis stages to be carried out are as follows:

- a) Search for any companies operating in the Iron and Steel sector on Google
- b) Collect data on shares of companies operating in the Iron and Steel sector on the yahoofinance.com website
- c) Calculate the rate of return for each share ( $R_i$ ).
- d) Calculate the market rate of return ( $R_m$ ).
- e) Calculate the risk-free rate of return ( $R_f$ ) using the monthly interest rate index (SBI).
- f) Look for the level of systematic danger of every stock ( $\beta$ ).
- g) Find the expected fee of go back.
- h) Classify undervalued and overvalued stocks.

## DISCUSSION

### Individual Rate Of Return Analysis ( $R_i$ )

( $R_i$ ) may be calculated via subtracting this month's proportion fee from the preceding month's share charge and comparing it with the previous month's proportion price.

Table 2. Return (Ri) Data

No	CODE	Ri
1	BTON	0.019701945
2	CTBN	0.067045064
3	GDST	-0.096849146
4	GGRP	-0.096849146
5	ISSP	-0.074804382
6	KRAS	-0.040947119
7	LMSH	-0.064685315
8	OPMS	-0.42

based at the statistics above, it can be visible that the best rate of return on shares (Ri) is located in companies PT. Tubindo image that is, as big as 0.067045064 and the lowest fee of return on shares (Ri) is observed inside the company Optima Prima Metal Synergy a mounting to -0.42.

### Market Return (Rm) Analysis Effects

In calculating marketplace returns, IHSG (Composite stock rate Index) is the marketplace index used in this studies, IHSG is used due to the fact it's miles considered able to representing all inventory transaction sports in BTON.

Table 3. Market Return (Rm) BTON Data

Date	Close	Individual Return (RI)
01/11/2022	444,000,000	
01/12/2022	432,000,000	-0.027027027
01/01/2023	424,000,000	-0.018518519
01/02/2023	416,000,000	-0.018867925
01/03/2023	404,000,000	-0.028846154
01/04/2023	428,000,000	0.059405941
01/05/2023	430,000,000	0.004672897
01/06/2023	432,000,000	0.004651163
01/07/2023	428,000,000	-0.009259259
01/08/2023	408,000,000	-0.046728972
01/09/2023	428,000,000	0.049019608
01/10/2023	408,000,000	-0.046728972
	Average Monthly Return	0.019701945
	Annual Return (Ri)	0.019701945

Adjusted Beta Value:	0.716
Average Beta:	0.86575
Risk Free Rate	5.21%

Based on the data above, the highest IHSI occurred in September 2023, namely 0.049019608. Meanwhile, the lowest JCI price will be in July 2023, namely -0.009259259. If we calculate the average return from November 2022 to October 2023, then the rate of change in IHSI prices is around 4.47753389638375.

**Risk Free (RF) Analysis Consequences**

In calculating the threat-loose fee of go back, the measure used is BI hobby price records issued by means of the authorities, specifically the bank Indonesia certificate (SBI). The consequences of the threat unfastened price calculation are as follows:

Table 4. Risk Free (Rf) Data

Date	RF BI
01/11/2022	5.21%
01/12/2022	5.21%
01/01/2023	5.21%
01/02/2023	5.21%
01/03/2023	5.21%
01/04/2023	5.21%
01/05/2023	5.21%
01/06/2023	5.21%
01/07/2023	5.21%
01/08/2023	5.21%
01/09/2023	5.21%
01/10/2023	5.21%
<b>Amount</b>	62.52%
<b>Highest Score</b>	5.21%
<b>Lowest Score</b>	5.21%
<b>Average</b>	5.21

This risk-free rate of return was obtained from SBI analysis in the observation period from January 2023 to September 2023, where the SBI interest rate set by the government appeared to be stable, experiencing no decrease and increasing by 5.21% every month.

**Results Of Systematic Danger Calculation Evaluation For Each Individual Stock (B)**

The relationship among inventory returns and marketplace returns can be seen by calculating the inventory beta. The following are the results of systematic chance calculations for the 8 employer shares on this studies. BTON (0.716), CTBN (0.419), LMSH (0.593) and OPMS (0.468)

Table 5. Beta Data

No	CODE	RAW BETA	ADJUSTED BETA
1	BTON	0.574	0.716
2	CTBN	0.218	0.419
3	GDST	1,069	1,046
4	GGRP	1,424	1,282
5	ISSP	1,213	1,142
6	KRAS	2,121	1,747
7	LMSH	0.390	0.593
8	OPMS	0.202	0.468

Beta = 1, which means that for each one percent exchange in market returns, the inventory or portfolio go back will also trade by way of the identical amount following marketplace changes. Go back. Stocks that have a beta value > 1 are said to have a extra risk than the marketplace average hazard stage. shares which have a beta cost < 1 are said to be stocks that have a risk below the market average.

The size of the beta for each stock does not indicate how good or bad the stock is, but only shows how volatile the stock is. Investors who tend to avoid risk are more suited to choosing stocks that have a beta of less than 1.

#### Results Of Analysis Of Calculation Of Expected Rate Of Return (E(Ri))

The expected rate of return [E(Ri)] is the amount of investors' expectations regarding the return generated from stock investments.

Table 6. Expected Return Data

No	CODE	E(Ri) CAPM
1	BTON	4.477533896
2	CTBN	4.518521202
3	GDST	4.21177084
4	GGRP	4.477533896
5	ISSP	4.395715044
6	KRAS	4.425026969
7	LMSH	4,404475626
8	OPMS	4.096861938

The table above shows the expected returns from the 8 companies in this research. The highest expected return is owned by the CTBN Citra Tubindo company of 4.518521202. Meanwhile, the OPMS company Optima Prima Metal Sinergi has the lowest expected return of 4.096861938. The higher the expected return, the lower the risk the investor will take on the stock.

## Classification Of Undervalued And Overvalued Stock

Primarily based on calculations that have been completed previously, shares may be categorized via evaluating  $R_i$  with  $E(R_i)$  CAPM. If the  $R_i > E(R_i)$  CAPM then the inventory can be categorized as an undervalued / inexperienced inventory to shop for. in the period in-between, if the  $R_i < E(R_i)$  CAPM then the inventory can be labeled as an overvalued / inefficient inventory. the following is the inventory classification records:

Table 7. Classification of Stock Data

No	CODE	Issuer Name	E(Ri) CAPM	RESULT	SCORE	DECISION
1	BTON	PT. Beton Jaya Manunggal	4.477533896	$R_i < E(R_i)$	Undervalued	Buy/Hold
2	CTBN	PT. Tubindo image	4.518521202	$R_i < E(R_i)$	Undervalued	Buy/Hold
3	GDST	PT. Gunawan Dianjaya Steel	4.21177084	$R_i < E(R_i)$	Undervalued	Buy/Hold
4	GGRP	PT. Mount Raja Paksi	4.477533896	$R_i < E(R_i)$	Undervalued	Buy/Hold
5	ISSP	PT. Steel Pipe Industry of Indonesia	4.395715044	$R_i < E(R_i)$	Undervalued	Buy/Hold
6	KRAS	PT. Krakatoa Steel	4.425026969	$R_i < E(R_i)$	Undervalued	Buy/Hold
7	LMSH	PT. Lionmesh Prima	4.404475626	$R_i < E(R_i)$	Undervalued	Buy/Hold
8	OPMS	PT. Optima Prima Metal Synergy	4.096861938	$R_i < E(R_i)$	Undervalued	Buy/Hold

Based on desk 7, it is able to be seen that there are 8 corporations whose stocks are all categorised as Undervalued. thus it is able to be concluded that at times like this buyers want to shop for stocks, particularly in organizations which can be covered inside the undervalued institution. because, the ones investors have a remarkable possibility to get excessive returns within the future. moreover, investors who already personal hyped up stocks ought to promote these shares so that investors do no longer revel in more risks in the destiny.

## CONCLUSION

The belief of this research changed into acquired from calculating 8 enterprise shares 8 companies which are categorized as green stocks. stocks which are classified as efficient are BTON, CTBN, GDST, GGRP, ISSP, KRAS, LMSH, OPMS. consequently, the investment decision that buyers can take is to buy those shares because they're undervalued.

Primarily based at the analysis and discussion, researchers have several recommendations for traders wherein buyers can search for information about a inventory to be invested in earlier than investing in each of those shares. there are numerous methods to choose which shares are effective to buy and one in every of them is to apply the CAPM calculation as studied in this studies. using CAPM can reduce the threat that an investor will accept and might gain returns which can be in step with investor expectancies. For buyers who do not like high-danger stocks, investors can choose undervalued stocks that have a beta ( $\beta$ ) of less than 1, namely BTON (zero.716), CTBN (zero.419), LMSH (zero.593) and OPMS (0.468). A stock that has a beta of less than 1 way the inventory is a inventory that has low percentage charge volatility, making it appropriate for traders who don't like excessive-hazard stocks. then again, if investors like excessive hazard, buyers can select stocks that have undervalue and a beta price of more than 1. For similarly studies, it's far was hoping that the studies period could be multiplied and the research item changed.



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