Enrichment: Journal of Management, 13 (1) (2023)
Published by: Instiute of Computer Science (IOCS)
Enrichment: Journal of Management
Journal homepage: www.enrichment.iocspublisher.org

Capital asset pricing model as an analysis of the efficient grouping of stock

An Suci Azzahra[1], Tengku Eka Susilawaty [2], Alyuna Andini [3]
[1,2,3] Fakultas Sosial Sains, Universitas Pembangunan Panca Budi, Medan, Indonesia

ARTICLEINFO

Article history:

Received March 20, 2023
Revised March 30, 2023
Accepted April 25, 2023

Keywords:

Capital Asset Pricing Model
Investation decision
Stock Return

ABSTRACT

This research is applied research with descriptive research methods using secondary data. The purpose of this study is to find out which stocks are efficient and inefficient by using the CAPM method to avoid investment mistakes so that investors can understand the CAPM method to help them determine the best investment decisions. The population of this study is the Business-27 Index for the 2019–2021 period. The sampling method used was purposive sampling, with a total sample of 16 companies. This study uses monthly closing price data and SBI data with Business Index data 27. The results show that there are seven efficiency stocks in the CAPM model, namely ADRO, BBCA, BBNI, BBRI, BMRI, TLKM, and UNTR.

Corresponding Author:

An Suci Azzahra,
Fakultas Sosial Sains,
Universitas Pembangunan Panca Budi,
Jl. Jend. Gatot Subroto Km. 4,5 Sei Sikambing, Medan, Sumatera Utara, 20122, Indonesia,
Email: ansuci@dosen.pancabudi.ac.id

INTRODUCTION

National income or GDP is closely related to investment. Investment in the form of increased capital investment will have a positive impact on the production process in an increasingly high business, then it will also have an impact on improving the economy in Indonesia, such as building factories, and infrastructure, improving the quality of Health and Education and automatically opening up the many jobs needed to realize development goals. Capital market investment is a source of capital for businesses or a way for businesses to obtain funds from0the investor the public or investors. A facility for the public to purchase financial products for investment, such as stocks, bonds, mutual funds, and other capital market products. The benefit of stock investment obtained is gain. The more developed a company from time to time will be followed by a rise in the price of the stock of the company. Investment also has risks, where the losses experienced by investors always haunt investors. Investments with a high level of risk have a high-profit potential. Stocks are one of today's investment alternatives that are profitable to do properly and correctly, by buying shares, means being one of the owners of the issuer company.

The investment decision is an action taken by investors in allocating several funds in the form of investment, with the expectation of profit in the long term. The company's investment selections are crucial for its sustainability since they affect the money that will be used for

investments, the kind of investment to be made, the expected return, and any potential investment hazards. The choices made must be carefully evaluated because they will have long-term effects because investment decisions have a long-term temporal dimension. Risk and projected return have a unidirectional, linear relationship, which is the third factor considered when making investment decisions. This implies that the expected return on an asset increases with asset risk and vice versa. For that, we need an analysis that can provide information about the return and risk that will be accepted later. In investing in the capital market, especially portfolios, in addition to calculating the expected return, an investor must also pay attention to the risks that must be borne. CAPM (Capital Asset Pricing Model) is a balance model that is often used to determine the relevant risk associated with an asset and the anticipated risk-return relationship (Indra 2018).

Return and risk are two things that cannot be separated, and have a positive relationship, where if the rate of return is low, the level of risk is also low, and vice versa. The ability to estimate For investors, a stock's rate of return is essential. to be able to accurately and simply predict a stock's return, investors must use an estimation model, one of which is the Capital Asset Pricing Model (CAPM) which can be used to estimate the return of a stock. According to Zubir (2011), the Capital Asset Pricing Model (CAPM) is a model of how risk and expected return of an investment or portfolio are related (Aprialinita et al. 2022). According to Jogiyanto (2010), CAPM is a market equilibrium model, in equilibrium, every risky asset must be another capital market portfolio because all investors will hold the portfolio. Stock risk in the CAPM is measured by beta (β), in the CAPM the expected rate of return [E(Ri)] is determined by the market rate of return (Rm), risk-free rate of return (Rf), and systematic risk (β). The result expected from using the CAPM is to provide an accurate estimate of the relationship between the risk of an asset and the expected return, determine the price of an asset, and as a basis for determining groups of stocks that can be selected as a place of investment (Aprialinita et al. 2022).

Investors have the desire to benefit from both dividends and capital gains, therefore an investor will buy stocks that have good liquidity, in Indonesia itself, there is an index consisting of companies that meet the criteria as a company with the highest market capitalization, an index called Index Bisnis-27 tracks the price movements of 27 stocks chosen by the Indonesian Business Index Committee. The media company PT Jurnalindo Aksara Graphic collaborated with the BISNIS-27 index's launch and management (publisher of the Bisnis Indonesia daily newspaper). The IDX and Bisnis Indonesia carry out regular monitoring and will later evaluate the replacement of stocks that meet the criteria for the business-27 index. This activity is carried out every 6 months, namely at the beginning of May and November, due to good criteria in classifying shares that can enter the 27 selected stocks, investors make Business-27 a reference for investing in the capital market. This study investigates which stocks are efficient and inefficient based on the calculations of the Capital Asset Pricing Model (CAPM) and how high the return and risk are for each firm featured on the Business-27 Index for the 2019–2021 period (CAPM).

Investment decisions are choices made in collecting income from an asset to gain future profits (Widyawati et al. 2022). Investment decisions are decisions that lead to providing solutions to the problem of the size of the investment to be made and the selection of the type of investment based on thinking about the maximum possible return with the smallest possible risk (Widyawati et al. 2022). Errors in making investment decisions will have an impact on the risks that must be borne by the company and then affect the value of the company. The purpose of investment decisions made by the company is to get a high amount of profit while taking on some risk (Widyawati et al. 2022)

The Capital Asset Pricing Model was pioneered by Sharpe, Lintner, and Mossin in 1964-1966. According to (Bodie, Kane, and Marcus 2014), The CAPM model, a crucial component of the financial industry, forecasts how an asset's expected returns and risk will balance out under equilibrium conditions. According to (Aprialinita et al. 2022) In a situation when there is a balanced market, the CAPM model links the expected rate of return from a risky asset to its risk. The Capital

Asset Pricing Model (CAPM) was developed by William Sharpe, John Lintnar, and Jan Mossin twelve years after Harry Markowitz proposed modern portfolio theory in 1952. A asset or portfolio's projected return and risk are modeled using the CAPM method (Wahyuny and Gunarsih 2020).

In the CAPM method, the market portfolio is very influential because it is assumed that the relevant risk is systematic as measured by beta (the sensitivity level of security returns to changes in market returns). According to Jagiyanto (2014: 44), an efficient grouping of shares is based on the Capital Asset Pricing Model Method (Firmansyah, Norisanti, and Danial 2022) Efficient Shares Efficient stock conditions indicate that the rate of return on individual stocks (Ri) is greater than the expected rate of return [E(Ri)] and Inefficient Stocks Inefficient stocks indicate that the individual rate of return (Ri) is smaller than the expected rate of return.

Stock return is one of the factors that motivates investors to invest and is also a reward for the courage of investors to take the risk of their investment (Kusumawati and Safiq 2019). Stock return is one of the things that motivates investors when investing in stocks. Stock return is a yield obtained by investors from the capital invested in the stock market (Kusmayadi et al. 2018). Stock returns are obtained by comparing the difference between the stock price and the closing price in the previous period. By deducting the closing price of the current stock from the closing price of the prior period, the difference in share prices can be calculated. The calculation of stock returns can have both positive and negative results (Caesar et al. 2021).

RESEARCH METHOD

The research used is descriptive and quantitative, describing data and information based on facts obtained in the field. This study uses quantitative analysis of stock price data for Business Index 27 companies, Business Index 27 market returns, and SBI interest rates. The population in this study are all stock companies listed on the Indonesia Stock Exchange on the Bisnis-27 stock index in the period 2019 to 2021. The sampling technique used is purposive sampling, with the following criteria: Companies listed on the Indonesia Stock Exchange that are included in the Bisnis-27 Stock Index, Companies whose shares are consistently included in the Bisnis-27 Index for the period 2019 – 2021 (not included in the Business-27 stock index), Complete data available for the period 2019 – 2021.

Table 1. List of shares that are consistently included in the 27 business index shares for the 2019-2021 period

No	Company name	Code
1	Adaro Energy Tbk.	ADRO
2	Astra International Tbk.	ASII
3	Bank Central Asia Tbk.	BBCA
4	Bank Negara Indonesia (Persero) Tbk.	BBNI
5	Bank Rakyat Indonesia (Persero) Tbk.	BBRI
6	Bank Mandiri (Persero) Tbk.	BMRI
7	Charoen Pokphand Indonesia Tbk	CPIN
8	Indofood CBP Sukses Makmur Tbk.	ICBP
9	Indah Kiat Pulp & Paper Tbk.	INKP
10	Indocement Tunggal Prakarsa Tbk.	INTP
11	Kalbe Farma Tbk.	KLBF
12	Bukit Asam Tbk.	PTBA
13	Pakuwon Jati Tbk.	PWON
14	Semen Indonesia (Persero) Tbk.	SMGR
15	Telkom Indonesia (Persero) Tbk.	TLKM
16	United Tractors Tbk.	UNTR

Source: (www.idx.co.id n.d.) (processed according to data)

The data used in this study will be processed using Microsoft Excel. In this writing, Secondary data was utilised in this study technique. Secondary data comes from sources such as

other persons or documents that do not directly offer data to data collectors (Muhamad and Maulana 2019). The study's secondary data sources were: The data of the companies included in the business-27 stock index are obtained from statistical data published by the Indonesia Stock Exchange, Stock price data, and business-27 stock index obtained from statistical data published on behalf of the Indonesia Stock Exchange. employed a data analysis technique :

Calculating the Expected Return of the Bisnis-27 Stock Index using the CAPM Model

According to (Bodie et al. 2014), the formula can be used to get the expected rate of return from security for the CAPM model:

$$(Ri) = Rf + \beta i\,[E\,(Rm) - Rf] \quad (1)$$

Where $E(Ri)$ is the expected level of income from securities I which contains risk, Rf is the risk-free level of income, $E(Rm)$ is the expected level of income from the market portfolio and βi is a measure of risk that cannot be diversified from valuable to -i. The following variables are connected to the CAPM formula: Selecting Real Return Saham Bisnis-27 (R_i)

Based on the notion of return, that the return of a stock is the result obtained from an investment by calculating the difference in stock prices for the current period and the previous period by ignoring dividends, it can be written using the formula (Jogiyanto, 2013):

Where:

$$Ri = \frac{Pi,t - (Pi,t-1)}{Pi,t-1} \quad (2)$$

$R_{i,}$ = *actual return on selected 27 business stocks*

$P_{i,t}$ = price on time t

$P_{i,t-1}$ = prices for earlier times

Market Return (R_m)

The market return is calculated using the following formula (Masithoh 2017):

$$Rm = \frac{Bisnis27_t - (Bisnis27_{t-1})}{Bisnis27_{t-1}} \quad (3)$$

Where:

R_m = *Market return*

Bisnis-27 $_t$ = *Business Index-27 at the end of the period* t

Bisnis-27 $_{t-1}$ = *Business Index-27 in the previous period*

Meanwhile, the expected market return E(Rm) is the average rate of return on the capital market in a certain period, which is assessed from the average business stock price index27.

Risk-Free Asset Return

The risk-free return on assets (Rf) used in the CAPM model is obtained from the SBI interest rate for one month divided by twelve months (Masithoh 2017).

Stock Betas

$$Rf = \frac{SBI_t}{12} \quad (4)$$

To determine the expected return with the previous CAPM, you have to calculate the beta () value. The return volatility of a security or a portfolio's return on investment is measured by beta. The systematic risk of a portfolio or asset is thus measured by beta. A security's beta is calculated by dividing the market return variance by the return covariance between the i-th security and the market return. as follows when calculating the stock beta (Bodie et al. 2014) :

$$\beta_i = \frac{Co\,(R_i\,,\,R_m)}{Var\,(R_m)} \quad (5)$$

RESULTS AND DISCUSSIONS

Company Stock Return Business Index-27

The data used in this study are monthly closing price data for the shares of the Bisnis-27 Index companies in the period December 2018 to December 2021. The estimated return on stocks (Ri) is calculated using the current month's closing price as the real stock return. this (Pt) minus last month's closing price (Pt-1) divided by last month's closing price (Pt-1). The average stock return of the sample companies from 2018 to 2021 is presented in table 2. Based on the results of calculating the average monthly stock return for each company from 2018 to 2021, it can be seen that the overall average is 0.00504, this means that all average business index stock returns per month are positive, and this shows that in the 2019-2021 period investors responded positively to the Bisnis-27 Index shares. The highest average monthly stock return is Adaro Energy Tbk. namely 0.02101 per month, while the lowest average stock return per month is Semen Indonesia (Persero) Tbk. which is equal to -0.01077.

Table 2. Average stock return per month company business index-27 the year 2019-2021

NO	Company name	Code	Stock Return (Ri)
1	*Adaro Energy Tbk.*	*ADRO*	*0,02101*
2	*Astra International Tbk.*	*ASII*	*-0,00703*
3	*Bank Central Asia Tbk.*	*BBCA*	*0,01004*
4	*Bank Negara Indonesia (Persero) Tbk.*	*BBNI*	*0,00307*
5	*Bank Rakyat Indonesia (Persero) Tbk.*	*BBRI*	*0,00552*
6	*Bank Mandiri (Persero) Tbk.*	*BMRI*	*0,00488*
7	*Charoen Pokphand Indonesia Tbk*	*CPIN*	*-0,00022*
8	*Indofood CBP Sukses Makmur Tbk.*	*ICBP*	*-0,00392*
9	*Indah Kiat Pulp & Paper Tbk.*	*INKP*	*-0,00285*
10	*Indocement Tunggal Prakarsa Tbk.*	*INTP*	*-0,01022*
11	*Kalbe Farma Tbk.*	*KLBF*	*0,00306*
12	*Bukit Asam Tbk.*	*PTBA*	*-0,00625*
13	*Pakuwon Jati Tbk.*	*PWON*	*-0,00396*
14	*Semen Indonesia (Persero) Tbk.*	*SMGR*	*-0,01077*
15	*Telkom Indonesia (Persero) Tbk.*	*TLKM*	*0,00436*
16	*United Tractors Tbk.*	*UNTR*	*0,00195*
Average			0,00054

Source: PT. Indonesia Stock Exchange, Data Processed by Author

Return Market

The market index used in this study is the Business Index-27, the data used is monthly closing price data for the period December 2018 to December 2021

Table 3. Return market (rm) for 2019-2021

Period	2019	2020	2021
jan	0,0491	-0,0383	-0,0252
feb	-0,0342	-0,0785	0,0257
mar	0,0130	-0,1791	-0,0432
apr	-0,0001	0,0120	-0,0206
may	-0,0394	0,0104	0,0004
jun	0,0289	0,0493	-0,0615
jul	0,0108	0,0705	-0,0101
aug	-0,0202	0,0194	0,0461
sep	-0,0364	-0,1008	0,0283
oct	0,0169	0,0546	0,0682
nov	-0,0287	0,0950	-0,0175
dec	0,0487	0,0450	0,0144

Return Year		0,0007	-0,0034	0,0004
	Average			-0,000744

Source: PT. Indonesia Stock Exchange, Data Processed by Author

The return market for 2019-2021 has fluctuated greatly, so there are returns on the Business-27 Index that are negative which indicates risks, such as the returns in 2019 in February (-0.0342), April (-0.0001), May (-0.0394), August (-0.0202), September (-0.0364) and November (-0.0287). In 2020 January -0.0383), February -0.0785), March (-0.1791), and September (-0.1008). As well as in 2021 in January (-0.0252), March (-0.0432), April (-0.0206), June (-0.0615), July (-0.0101), and November (-0,0175). Even though there is a negative return on the Business-27 Index, the performance of the Business-27 Index is still considered good because in other months the return is positive. So that the annual return of the Bisnis-27 Index is positive.

The highest average annual market return was in 2019, which was 0.0007. Meanwhile, the lowest average is in 2020, which is -0.0034. The average total return market is -0.000744, which means that so far investors are still responding negatively to the Bisnis-27 Index shares due to the start of Covid-19 in March 2020, so the market return value has suffered a loss of -0.1791.

CAPM Systematic Risk

Systematic risk or beta (β) of a stock, is a measure of market risk that affects the price of a stock. Beta measures the extent to which stock prices fluctuate along with fluctuations in market prices. The beta value of the stock is obtained from the results of the covariance between the return of security i and the market return divided by the variant of the market return. A positive beta value indicates the idea that rising market returns will be followed by rising stock returns. Conversely, if the beta is negative, it implies that falling stock returns will follow an increase in market returns. The beta of the Bisnis-27 Index for 2019-2021 is presented in table 4 below:

Table 4. CAPM systematic risk (Beta).

No	Code	Covarian (Ri,Rfm)	σ^2m	Beta(β)
1	ADRO	0.015695683	0.098913	0.158682
2	ASII	0.010387094	0.098913	0.105013
3	BBCA	0.026611286	0.098913	0.269039
4	BBNI	0.022079671	0.098913	0.223224
5	BBRI	0.052732162	0.098913	0.533119
6	BMRI	0.034621229	0.098913	0.350019
7	CPIN	0.039948485	0.098913	0.403877
8	ICBP	0.026061965	0.098913	0.263485
9	INKP	-0.017285404	0.098913	-0.17475
10	INTP	0.006397267	0.098913	0.064676
11	KLBF	-0.018693243	0.098913	-0.18899
12	PTBA	0.045132471	0.098913	0.456287
13	PWON	-0.026813844	0.098913	-0.27109
14	SMGR	0.031774005	0.098913	0.321233
15	TLKM	-0.006410637	0.098913	-0.06481
16	UNTR	0.040495002	0.098913	0.409402

Source: PT. Indonesia Stock Exchange, Data Processed by Author

Based on the calculations presented in the table above, all stocks have positive beta, this indicates an increase in the Business Index market return will result in an increase in the return on these stocks.

Beta which has a positive value has three measurements: (1) beta which has a value of one ($\beta = 1$) means that the stock has an average risk and is in the direction of market changes, besides

that it is also proportional to the company's profits. (2) Beta with a value greater than one ($\beta > 1$) suggests that although the company's profit level is more than anticipated, the stock risk is above average, making it vulnerable to market swings. Stocks with a value of $\beta > 1$ are aggressive stocks, meaning that if the market return increases by n%, the stock return will increase by more than n%. Based on table 4 there are no aggressive stocks. (3) Beta with a value of less than one ($\beta < 1$) means that the risk of the stock is below average and less sensitive to market changes with a profit level of the company that is smaller than expected. Stocks with a value of $\beta < 1$ are classified as weak stocks, meaning that if the market return increases by n%, the stock return will increase by less than n%. Based on table 4 there are 16 stocks which are defensive, namely all companies.

Expected Return with CAPM

Before calculating the expected return using the CAPM method, a risk-free return (Rf) is also needed, in this study using the SBI coupon rate.

Table 5. Expected return CAPM

No	Code	R_i	R_f	$E(R_m)$	β	$E(R_i)$ CAPM
1	ADRO	0.0210	0.0037	-0.0007	0.1587	0.0030
2	ASII	-0.0070	0.0037	-0.0007	0.1050	0.0033
3	BBCA	0.0100	0.0037	-0.0007	0.2690	0.0025
4	BBNI	0.0031	0.0037	-0.0007	0.2232	0.0027
5	BBRI	0.0055	0.0037	-0.0007	0.5331	0.0013
6	BMRI	0.0049	0.0037	-0.0007	0.3500	0.0022
7	CPIN	-0.0002	0.0037	-0.0007	0.4039	0.0019
8	ICBP	-0.0039	0.0037	-0.0007	0.2635	0.0025
9	INKP	-0.0028	0.0037	-0.0007	-0.1748	0.0045
10	INTP	-0.0102	0.0037	-0.0007	0.0647	0.0034
11	KLBF	0.0031	0.0037	-0.0007	-0.1890	0.0046
12	PTBA	-0.0063	0.0037	-0.0007	0.4563	0.0017
13	PWON	-0.0040	0.0037	-0.0007	-0.2711	0.0049
14	SMGR	-0.0108	0.0037	-0.0007	0.3212	0.0023
15	TLKM	0.0044	0.0037	-0.0007	-0.0648	0.0040
16	UNTR	0.0019	0.0037	-0.0007	0.4094	0.0019

Source: PT. Indonesia Stock Exchange, Data Processed by Author

Table 5 above, it shows that the amount of expected return (E(Ri)) of each type of stock follows the level of beta (risk). Shares of Pakuwon Jati Tbk. (PWON) has the lowest beta of -0.2711 but has the highest expected return of 0.0049 or 0.49%. Meanwhile, The greatest beta, 0.5331, is found in the shares of Bank Rakyat Indonesia (Persero) Tbk (BBRI) but has the lowest anticipated profit of 0.0013 or 0.13%.

In addition, you can also see which stocks are undervalued or which are overvalued. Based on the table above it appears that 9 stocks namely ASII, CPIN, ICBP, INKP, INTP, KLBF, PTBA, PWON, and SMGR are undervalued based on a computation utilizing the CAPM approach since the expected return (E(Ri)) is larger than the average return (Ri), these shares are eligible to be purchased. On the other hand, the 7 stocks, namely ADRO, BBCA, BBNI, BBRI, BMRI, TLKM, and UNTR, are overvalued stocks because their E(Ri) is lower than Ri, but the expected return for these stocks is still above risk-free (Rf). For investors who are risk cautious (risk averse), this stock is still worthwhile to purchase, but for risk seekers, it is not since, despite the stock's predicted return being higher than risk-free, it is still lower than the average return on the shares.

Classification of Efficient Stocks and Investment Decisions with CAPM

Efficient stocks are stocks with individual returns greater than the expected rate of return [(Ri) > E(Ri)]. Inefficient stocks are stocks with individual returns that are smaller than the expected rate of return [(Ri) < E(Ri)].

Table 6. List of efficient and inefficient shares with CAPM

Code	R_i	ER_i	Stock Evaluation
ADRO	0,02101	0,00301	Efficient/Good
ASII	-0,00703	0,00325	Not Efficient / Not Good
BBCA	0,01004	0,00252	Efficient/Good
BBNI	0,00307	0,00272	Efficient/Good
BBRI	0,00552	0,00134	Efficient/Good
BMRI	0,00488	0,00216	Efficient/Good
CPIN	-0,00022	0,00192	Not Efficient / Not Good
ICBP	-0,00392	0,00254	Not Efficient / Not Good
INKP	-0,00285	0,00450	Not Efficient / Not Good
INTP	-0,01022	0,00343	Not Efficient / Not Good
KLBF	0,00306	0,00456	Not Efficient / Not Good
PTBA	-0,00625	0,00168	Not Efficient / Not Good
PWON	-0,00396	0,00493	Not Efficient / Not Good
SMGR	-0,01077	0,00229	Not Efficient / Not Good
TLKM	0,00436	0,00401	Efficient/Good
UNTR	0,00195	0,00189	Efficient/Good

Source: PT. Indonesia Stock Exchange, Data Processed by Author

Based on table 6, there are 7 efficient company shares and 9 inefficient company shares. The criteria for determining investment decisions are choosing efficient stocks, stocks that have individual returns greater than the expected rate of return (Ri>ERi) while excluding underperforming equities, or those with individual returns that are lower than the expected rate of return (Ri <ERi).

The investment decisions made on efficient/good stocks are considering buying these shares, and the investment decisions made on inefficient/not good stocks are considering selling these shares.

CONCLUSION

Based on the research and results of data analysis conducted, this study concludes that the results of the study show that there are 7 efficiency stocks in the CAPM model, namely ADRO, BBCA, BBNI, BBRI, BMRI, TLKM, and UNTR. There are 13 inefficient stocks in the CAPM model, namely ASII, CPIN, ICBP, INKP, INTP, KLBF, PTBA, PWON, and SMGR. Based on the research that has been done, the suggestions that can be given by researchers are for investors and potential investors, this research is expected to be used as a reference and additional information for investors and potential investors who will invest in stocks. Investors need to invest their excess funds in efficient stocks so that the risks to be faced can be minimized properly, and so that the investor's goal of getting the expected return can be achieved and for urther research research using the APT method, financial performance, and company size is expected to be used as a reference for further research with different samples and research periods and adding other variables, so that developments regarding the capital market, especially stock investment, can always be known..

ACKNOWLEDGEMENTS

The author wishes to thank the member authors. In addition, the authors would like to express special thanks to the Chancellor of the Panca Budi Development University, Dr. H. M. Isa Indrawan, SE., MM through the Head of the Research Institute and Study Center (PRDP) at Pembangunan Panca Budi University who has provided research funding support through the UNPAB internal grant program in 2023.

References

Aprialinita, Dhea, Fezi Waldeska Aulia, Mentari Dwi Aristi, Nurul Hikmah Putri, and Vina Putri Permatasari. 2022. "Capital Asset Pricing Model (CAPM) As An Analytical Tool In Making Stock Investment Decisions On The LQ-45 Iidex On The Indonesia Stock Exchange (IDX) For The Period August 2020-January 2021 Capital Asset Pricing Model (CAPM) Sebagai Alat Analisis Dalam P." Research In Accounting Journal 2(2):256–63.

Ayub, U. 2020. "Downside Risk-Based Six-Factor Capital Asset Pricing Model (CAPM): A New Paradigm in Asset Pricing." Sustainability (Switzerland) 12(17). doi: 10.3390/SU12176756.

Bai, H. 2019. "The CAPM Strikes Back? An Equilibrium Model with Disasters." Journal of Financial Economics 131(2):269–98. doi: 10.1016/j.jfineco.2018.08.009.

Bai, Y. 2020. "Country and Industry Factors in Tests of Capital Asset Pricing Models for Partially Integrated Emerging Markets." Economic Modelling 92:180–94. doi: 10.1016/j.econmod.2019.12.019.

Barinov, A. 2020. "Estimating the Cost of Equity Capital for Insurance Firms With Multiperiod Asset Pricing Models." Journal of Risk and Insurance 87(1):213–45. doi: 10.1111/jori.12267.

Bekaert, G. 2021. "Risk and Return in International Corporate Bond Markets." Journal of International Financial Markets, Institutions and Money 72. doi: 10.1016/j.intfin.2021.101338.

Bodie, Kane, and Marcus. 2014. Manajemen Fortofolio Dan Investasi. 9th ed. Makassar: Salemba Empat.

Borup, D. 2019. "Asset Pricing Model Uncertainty." Journal of Empirical Finance 54:166–89. doi: 10.1016/j.jempfin.2019.07.005.

Boussaidi, R. 2022. "Contrarian Profits and Representativeness Heuristic in the MENA Stock Markets." Journal of Behavioral and Experimental Economics 97. doi: 10.1016/j.socec.2021.101820.

Caesar, G., Y. Shia, Y. Dananjaya, and C. E. Susilawati. 2021. "The Effect Of Return On Equity, Dividend Yield, Price Earning Ratio, Earning Per Share, And Firm Size On Stock Return On LQ45 Shares In Indonesia Stock Exchange." International Journal of Research Publications 245–53.

Cenesizoglu, T. 2019. "An Analysis on the Predictability of CAPM Beta for Momentum Returns." Journal of Forecasting 38(2):136–53. doi: 10.1002/for.2552.

Chen, X. 2022. "Economic Uncertainty and Australian Stock Returns." Accounting and Finance 62(3):3441–74. doi: 10.1111/acfi.12892.

Curran, M. 2020. "The CAPM, National Stock Market Betas, and Macroeconomic Covariates: A Global Analysis." Open Economies Review 31(4):787–820. doi: 10.1007/s11079-020-09579-2.

Ding, R. 2022. "Drawdown Beta and Portfolio Optimization." Quantitative Finance 22(7):1265–76. doi: 10.1080/14697688.2022.2037698.

Doukas, J. A. 2021. "Sentiment-Scaled CAPM and Market Mispricing." European Financial Management 27(2):208–43. doi: 10.1111/eufm.12306.

Evans, R. B. 2021. "Models or Stars: The Role of Asset Pricing Models and Heuristics in Investor Risk Adjustment." Review of Financial Studies 34(1):67–107. doi: 10.1093/rfs/hhaa043.

Ewald, C. O. 2022. "Salmon Futures and the Fish Pool Market in the Context of the CAPM and a Three-Factor Model." Aquaculture Economics and Management 26(2):171–91. doi: 10.1080/13657305.2021.1958105.

Firmansyah, M. I., N. Norisanti, and R. D. M. Danial. 2022. "Analisis Capital Asset Pricing Model (CAPM) Dan Earning Per Share (EPS) Dalam Pengambilan Keputusan Investasi Saham Pada Masa Covid-19." … Entrepreneurship Journal … 3(1):296–304.

da Fonseca, J. S. 2020. "Portfolio Selection in Euro Area with CAPM and Lower Partial Moments Models." Portuguese Economic Journal 19(1):49–66. doi: 10.1007/s10258-019-00153-4.

Gonçalves, A. S. 2021. "Aggregation, Capital Heterogeneity, and the Investment CAPM." Review of Financial Studies 33(6):2228–2771. doi: 10.1093/RFS/HHZ091.

Grillini, S. 2019. "Pricing of Time-Varying Illiquidity within the Eurozone: Evidence Using a Markov Switching Liquidity-Adjusted Capital Asset Pricing Model." International Review of Financial Analysis 64:145–58.

doi: 10.1016/j.irfa.2019.05.002.
Guo, H. 2020. "ICAPM and the Accruals Anomaly." Quarterly Journal of Finance 10(3). doi: 10.1142/S2010139220500147.
Hens, T. 2021. "Behavioural Heterogeneity in the Capital Asset Pricing Model with an Application to the Low-Beta Anomaly." Applied Economics Letters 28(6):501–7. doi: 10.1080/13504851.2020.1761529.
Holden, C. 2019. "Do the LCAPM Predictions Hold? Replication and Extension Evidence." Critical Finance Review 8(1):29–71. doi: 10.1561/104.00000071_supp.
Hollstein, F. 2020. "The Conditional Capital Asset Pricing Model Revisited: Evidence from High-Frequency Betas." Management Science 66(6):2474–94. doi: 10.1287/mnsc.2019.3317.
Hsu, P. H. 2022. "Patent Thickets, Stock Returns, and Conditional CAPM." Management Science 68(11):8343–67. doi: 10.1287/mnsc.2021.4229.
Hung, P. 2019. "The Relationship between Risk and Return - An Empirical Evidence from Real Estate Stocks Listed in Vietnam." Asian Economic and Financial Review 9(11):1211–26. doi: 10.18488/journal.aefr.2019.911.1211.1226.
Indra, Yetti Afrida. 2018. "Perbandingan Keakuratan Metode Capital Asset Pricing Model Dan Arbitrage Pricing Theory Dalam Memprediksi Return Saham (Studi Pada Perusahaan Sektor Barang Konsumsi Dan Sektor Pertambangan Yang Terdaftar Di Indeks Saham Syariah Indonesia (ISSI) Periode 20." Journal of Economic, Business and Accounting (COSTING) 1(2):233–40.
Jain, S. 2022. "Betas in the Time of Corona: A Conditional CAPM Approach Using Multivariate GARCH Model for India." Managerial Finance 48(2):243–57. doi: 10.1108/MF-05-2021-0226.
Jan, M. N. 2019. "Do the Fama and French Five-Factor Model Forecast Well Using Ann?" Journal of Business Economics and Management 20(1):168–91. doi: 10.3846/jbem.2019.8250.
Johnstone, D. 2020. "Fama's Ratio and the Effect of Operating Leverage on the Cost of Capital Under CAPM." Abacus 56(2):268–87. doi: 10.1111/abac.12191.
Kayo, E. K. 2020. "Capital Asset Pricing Model, Beta Stability, and the Pricing Puzzle of Electricity Transmission in Brazil." Energy Policy 142. doi: 10.1016/j.enpol.2020.111485.
Khoa, B. T. 2021. "Support Vector Regression Algorithm under in the CAPM Framework." 2021 International Conference on Data Analytics for Business and Industry, ICDABI 2021 186–90. doi: 10.1109/ICDABI53623.2021.9655797.
Kovner, A. 2022. "Evaluating Regulatory Reform: Banks' Cost of Capital and Lending." Journal of Money, Credit and Banking 54(5):1313–67. doi: 10.1111/jmcb.12875.
Kumar, G. 2019. "Liquidity-Adjusted CAPM — An Empirical Analysis on Indian Stock Market." Cogent Economics and Finance 7(1):1–15. doi: 10.1080/23322039.2019.1573471.
Kusmayadi, Dedi, Rani Rahman, and Yusuf Abdullah. 2018. "Analysis of the Effect of Net Profit Margin, Price to Book Value, and Debt to Equity Ratio on Stock Return." International Journal of Recent Scientific Research.
Kusumawati, Dian, and Muhammad Safiq. 2019. "Analisis Faktor–Faktor Yang Mempengaruhi Investment Opportunity Set Dan Implikasinya Terhadap Return Saham." Jurnal STEI Ekonomi 28(01):1–27. doi: 10.36406/jemi.v28i01.258.
Kwon, J. H. 2019. "Tail Risk and the Consumption CAPM." Finance Research Letters 30:69–75. doi: 10.1016/j.frl.2019.03.025.
Lin, Q. 2021. "The q5 Model and Its Consistency with the Intertemporal CAPM." Journal of Banking and Finance 127. doi: 10.1016/j.jbankfin.2021.106096.
Martinez-Fernandez, P. 2019. "Assessing Renewable Energy Sources for Electricity (RES-E) Potential Using a CAPM-Analogous Multi-Stage Model." Energies 12(19). doi: 10.3390/en12193599.
Masithoh, Latifatuzzarah. 2017. "Pengujian Validitas Capital Asset Pricing Model (CAPM), Islamic Capital Asset Pricing Model (ICAPM) Dan Arbitrage Pricing Theory (APT) Dalam Memprediksi Return Saham Syariah Di Jakarta Islamic Index (Periode Tahun 2012-2016)." Universitas Islam Negeri Syarif Hidayahtullah.
Mishra, D. R. 2019. "Fama-French, CAPM, and Implied Cost of Equity." Journal of Economics and Business 101:73–85. doi: 10.1016/j.jeconbus.2018.08.002.
Mondal, D. 2019. "A Note on a Mean-Lower Partial Moment CAPM without Risk-Free Asset." Operations Research Letters 47(4):264–69. doi: 10.1016/j.orl.2019.03.017.
Muhamad, Gulam, and Raju Maulana. 2019. "ANALISIS KOMPARASI KEAKURATAN METODE CAPITAL ASSET PRICING MODEL (CAPM) DAN ARBITRAGE PRICING THEORY (APT) DALAM

MEMPREDIKSI RETURN SAHAM (STUDI KASUS PADA PERUSAHAAN SEKTOR PRBANKAN DI BEI PERIODE 20014- Model Keseimbangan (CAPM) Dan Arbitrage Pri." JMBT (Jurnal Manajemen Dan Bisnis Terapan) 10(10):43–52.

Peswani, S. 2022. "Low-Risk Investment Strategy: Sector Bets or Stock Bets?" Managerial Finance 48(3):521–39. doi: 10.1108/MF-09-2021-0415.

Pham, T. N. 2019. "Estimating Sectoral Systematic Risk for China, Malaysia, Singapore, and Thailand." Annals of Financial Economics 14(3). doi: 10.1142/S2010495219500118.

Rojo-Suárez, J. 2022. "Liquidity, Time-Varying Betas and Anomalies: Is the High Trading Activity Enhancing the Validity of the CAPM in the UK Equity Market?" International Journal of Finance and Economics 27(1):45–60. doi: 10.1002/ijfe.2136.

Rutkowska-Ziarko, A. 2019. "Accounting Beta in the Extended Version of CAPM." Springer Proceedings in Business and Economics 147–56. doi: 10.1007/978-3-030-15581-0_14.

Savoia, J. R. Ferreira. 2019. "Comparing Results of the Implied Cost of Capital and Capital Asset Pricing Models for Infrastructure Firms in Brazil." Utilities Policy 56:149–58. doi: 10.1016/j.jup.2018.12.004.

Subekti, R. 2020. "Modified Capital Asset Pricing Model (CAPM) into Sharia Framework." Journal of Physics: Conference Series 1581(1). doi: 10.1088/1742-6596/1581/1/012021.

Terraza, M. 2021. "Adjusted Beta Based on an Empirical Comparison of OLS -CAPM and the CAPM with EGARCH Errors." International Journal of Finance and Economics 26(3):3588–98. doi: 10.1002/ijfe.1977.

Tilfani, O. 2020. "Multiscale Optimal Portfolios Using CAPM Fractal Regression: Estimation for Emerging Stock Markets." Post-Communist Economies 32(1):77–112. doi: 10.1080/14631377.2019.1640983.

Urom, C. 2020. "A Dynamic Conditional Regime-Switching GARCH CAPM for Energy and Financial Markets." Energy Economics 85. doi: 10.1016/j.eneco.2019.104577.

Vinodkumar, N. 2020. "Financial Evaluation of Tadawul All Share Index (TASI) Listed Stocks Using Capital Asset Pricing Model." Investment Management and Financial Innovations 17(2):69–75. doi: 10.21511/imfi.17(2).2020.06.

Wahyuny, Try, and Tri Gunarsih. 2020. "Comparative Analysis of Accuracy Between Capital Asset Pricing Model (Capm) and Arbitrage Pricing Theory (Apt) in Predicting Stock Return (Case Study: Manufacturing Companies Listed on the Indonesia Stock Exchange for the 2015-2018 Period)." Journal of Applied Economics in Developing Countries 5(1):23–30.

Widyawati, Nur, Ita Rakhmawati, Nurjannah, Pipit Novila Sari, Cahyani Dewi Pangestuti, Donna Dwinita Adelia, Bethani Suryawardani, Yanti Budiasih, Putu Eka Nopiyani, Tieka Trikartika Gustyana, Misbawati, Helin G. Yudawisastra, and Maria Lusiana Yulianti. 2022. Manajemen Keuangan. CV. Widina Media Utama.

www.idx.co.id. n.d. "No Title."

Xie, S. 2022. "Exposure to Concentrated Ambient PM<inf>2.5</Inf> (CAPM) Induces Intestinal Disturbance via Inflammation and Alternation of Gut Microbiome." Environment International 161. doi: 10.1016/j.envint.2022.107138.

Yang, C. 2021. "Individual Stock Sentiment Beta and Stock Returns." North American Journal of Economics and Finance 55. doi: 10.1016/j.najef.2020.101306.

Zemmoudj, S. 2019. "CAPM: Context-Aware Privacy Model for IoT-Based Smart Hospitals." 2019 15th International Wireless Communications and Mobile Computing Conference, IWCMC 2019 1139–44. doi: 10.1109/IWCMC.2019.8766630.