
COMPARISON OF INVESTMENT VALUATION MODEL, SINGLE INDEX MODEL CAPITAL ASSET PRICING MODEL, AND ARBITRAGE PRICING THEORY

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Abstract

There are several ways that can be done to calculate the expected return of stock investment, for example the Single Index Model, the Capital Asset Pricing Model, Arbitrage Pricing Theory and many other calculation models. In connection with this, a comparative analysis of the expected return between SIM, CAPM and APT was carried out on 17 LQ30 issuers and 2 non-LQ30 issuers for the 2018 period. As a market comparison, the IDX value was used while the macroeconomic variable used was the average government bank deposit interest rate and monthly inflation rate. From the research results, it is known that CAPM cannot predict stocks that have the potential to increase significantly but can assess a significant decline in stock performance. SIM without including risk free assets cannot show accurate results. The SIM also could not show a significant decline assuming all was well. APT shows how stocks that have good results compared to bad ones, on the other hand, can show fairly good results despite a significant decline. The three calculation methods mentioned above are mutually supportive and complementary. There is no better way of calculating one another.

Kata Kunci: Expected Return, Single Index Model, Capital Asset Pricing Model, Arbitrage Pricing Theory

Introduction

The capital market is one of the important elements and benchmarks of a country's economic progress. One of the characteristics of advanced industrial countries and new industrial countries is the existence of a well-developed capital market. The capital market in general is a place where sellers and buyers meet to conduct transactions in order to obtain capital. In sharia, the capital market has the meaning of a capital market whose entire mechanism of activities, especially regarding issuers, types of securities traded and trading mechanisms, is in accordance with sharia principles (Tandelilin, 2010).

Referring to Wikipedia, it states that "Investment management is the professional asset management of various securities of stocks, bonds and other securities and other assets such as real estate to fulfil set investment objectives for the benefit of investors. The main factor to be considered is the level of risk and return. The tendency that occurs is that someone wants to get a high return with low risk. The higher the risk, the higher the return that will be obtained. (Hartono, 2016)

When investing, of course, investors will be faced with several considerations related to a level of risk they will face. A common problem that is often faced in investment is the lack of understanding of the risks and strategies that are often faced sometimes where investors experience a sharp decline in stock prices causing unexpected losses. many investors who own shares but do not know about the calculation so they want to know the calculation of how much profit has been obtained when buying shares as well as each investor must determine their respective portfolios to get the most optimal results.

To overcome these considerations, investors need to diversify using the level of return and risk that will be received for the formation of their investment portfolio, thus the diversification must be done more selectively so that the results can provide the most optimal profit. Thus, it can be concluded that the optimal portfolio is the result received from various diversification options by selecting the best option of course in need of calculation In investing in the capital market, especially portfolios, in addition to calculating the expected return, an investor must also pay attention to the risks he must bear. SIM (Single index model), CAPM (Capital Asset Pricing Model) and APT (Arbitrage Pricing Theory) are equilibrium models that are often used to determine the risk relevant to an asset, as well as the relationship

between risk and expected return. by using a portfolio performance calculation model. can produce the best analysis model in the preparation of an optimal portfolio which can later be used by analysts, investors and other interested parties as a consideration for making investment decisions. The research is motivated by several reasons as follows:

This research is interesting to research because of the factors that influence the amount of investment interest, especially in the younger generation of society. limitations in understanding are still low in conducting stock trading for that it is necessary to do a more in-depth agreement on how to increase investment and Conduct Analysis With investment calculations.

Literature Study

Portfolio

Modern portfolio theory was first introduced in 1952 by Markowitz which contains "don't put all your eggs in one basket". Where the purpose of this theory is that in order to get optimal investment returns by accepting certain risks it is necessary to combine various groups of shares into one portfolio, not just investing in one type of stock.

Return

Return is the result obtained from an investment that can take the form of actual return, which is the return that has occurred or expected return, which is the return that is expected to occur in the future. Every investment has a risk, this indicates that the investment does not provide a definite return. Under these circumstances investors will only expect to obtain a certain level of profit. This is what is called the expected return. In general, the expected return can be expressed as follows

$$ER_i = \sum_{t=1}^M P_{it} R_{it}$$

Dimana,
 $E(R_i)$: *expected return* pada saham ke-i
 P_{it} : probabilitas *return* saham ke-i pada kejadian ke-t
 R_{it} : *return* pada saham ke-i pada kejadian ke-t
 M : the number of events that may occur

Risk

Risk can be defined as the possibility of losses that will be experienced by investors or the uncertainty of the return that will be received in the future [5]. Risk is often associated with deviation from the expected outcome. (Horne James C. Van dan Wachowicz John M, 2007). define risk as the variability of returns against expected returns. The method used to calculate risk is standard deviation, which measures the absolute deviation of the values that have occurred from the expected values. Risk can be expressed as follows:

$$StD = \sqrt{\frac{1}{n} \sum_{i=1}^n (X_i - \bar{X})^2}$$

dimana
 StD : *standard deviation*
 X_i : nilai ke-i
 $E(X_i)$: *expected value*
 n : number of observations

Single Index Model

This theory was originally proposed by (Sharpe, 1963) to simplify the Markowitz model which is considered quite complicated in its use because it uses many variances and covariances. The SIM method can solve the problems of individual and institutional investors in compiling optimal portfolios. Referring to the SIM equation formula:

$$R_i = \alpha_i + (\beta_i * RM) + e_i$$

Capital Asset Pricing Model (CAPM)

Security Market Line Graph

The concept of CAPM is generally useful to identify the relationship between risk and return. CAPM is a theory of assessing the risk and return of assets based on the beta coefficient (an index of undiversifiable risk) against market effects. The line that shows the tradeoff between risk and expected return for an individual stock is called the Security Market Line (SML). This SML line is used to graphically draw the CAPM model. This expected return and beta relationship can be

The SML equation can be written as :

$$E(R_i) = R_f + \beta_i[E(R_M) - R_f]$$

Dimana,

$E(R_i)$: *expected return* pada saham ke-i

R_f : *return* yang bebas risiko

$E(R_M)$: *return* pasar

β_i : pengukur risiko saham ke-i

Equation (4) is what is called *Capital Asset Pricing Model (CAPM)*.

Arbitrage Pricing Theory (APT)

According to Ahmad Rodoni and Othman Young APT is actually based on CAPM, but it has considered other factors that affect stock returns. For the i-th stock in the tth time horizon, its return can be represented by a combination of the expected balanced return and the factors affecting it. For the i-th stock, the actual return can be formally expressed by the formula :

$$R_i = E(R_i) + \beta_{1i}F_1 + \beta_{2i}F_2 + \dots + \beta_{ni}F_n + \varepsilon_i$$

Dimana,

R_i : *actual return* pada saham ke-i

$E(R_i)$: *expected return* pada saham ke-i

β_{ni} : sensitivitas *return* faktor ke-n pada saham ke-i

F_n : *surprise* untuk suatu faktor (*actual value-expected value*)

ε_i : *unsystematic risk* / firm-specific risk, it is assumed all covariances between returns on stocks on stocks are related to the effects of the factors, so it is called uncorrelated risk.

In the model of APT, the beta of a stock measures its sensitivity to the factor. Since based on these two points, namely:

- (1) the factor that affects the rate of return, although called beta, it is necessary to distinguish beta within the scope of CAPM (indicating sensitivity to market returns) and beta within the scope of APT (indicating sensitivity to a factor),
- (2) the influencing factor can be more than one, the APT equation can be written.

$$(R_i) = R_f + \beta_{1i}[E(R_1) - R_f] + \beta_{2i}[E(R_2) - R_f] + \dots + \beta_{ni}[E(R_n) - R_f]$$

Atau dapat ditulis

$$E(R_i) = \lambda_0 + \lambda_{1i}b_{1i} + \lambda_{2i}b_{2i} + \dots + \lambda_{ni}b_{ni}$$

Dimana,

$E(R_i)$: *expected return* pada saham ke-i

$R_f = \lambda_0$: *return* yang bebas risiko

$\beta_{ni} = b_{ni}$: sensitivitas *return* faktor ke-n pada saham ke-i

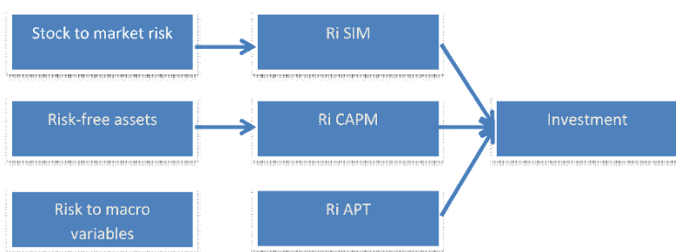
$\lambda_n = [E(R_n) - R_f]$: premi dari faktor ke-n

Method

The approach used in this research is verification, because there are variables that will be examined, and the aim is to present a structured, factual description of the facts and relationships between the variables studied. This research was conducted using a time series research design by focusing on risk compared to the expected return (Eko, 2010).

The secondary data used in this research is a list of stock prices released online and in real time. The data collection technique in accordance with the type of data required is documentation. The data collected is online stock price data on the Indonesia Stock Exchange website. The price taken comes from the last price in the afternoon on that day for the end of the month and mid-month so that 24 stock price data are obtained. Data on the average deposit interest rate of state banks and the monthly inflation rate published by the Central Bureau of Statistics, Determination of research objects is taken randomly with a note on objects that have positive price movements and active transactions. The object of this research is a go public company included in the LQ30 as many as 17 issuers namely ADHI, ADRO, ANTM, ASII, BBCA, BMRI, HMSP, ICBP, INTP, JSMR, KLBF, SMGR, SRIL, SSMS, TLKM UNTR, UNVR plus 2 non LQ30 go public companies namely KINO and SHID.

Based on this, the research paradigm can be described below



Picture of Research Framework

C. Results and discussion

1. Capital Asset Pricing Model (CAPM)

In determining the expected return of a stock, each stock can be obtained as follows:

Tabel 1.
Expected Returns with CAPM

	30-Dec-18	29-Dec-19	Rf	Ri capm
1 ADHI	2,083	1,884	6	3.89
2 ADRO	1,685	1,865	6	7.45
3 ANTM	890	625	6	3.99
4 ASII	8,274	8,311	6	5.89
5 BBCA	15,520	21,910	6	68.32
6 BMRI	11,585	8,001	6	(30.58)
7 HMSP	3,835	4,374	6	9.52
8 ICBP	8,585	8,901	6	10.45
9 INTP	15,410	21,951	6	67.05
10 JSMR	4,321	6,410	6	27.39
11 KINO	3,032	2,121	6	(5.20)
12 KLBF	1,525	1,691	6	8.09
13 SHID	895	1,551	6	11.75
14 SMGR	9,185	9,902	6	19.25
15 SRIL	231	380	6	7.25
16 SSMS	1,410	1,502	6	5.35
17 TLKM	3,981	4,443	6	11.47
18 UNTR	21,251	28,524	6	128.12
19 UNVR	38,810	46,967	6	130.04
IDX	5,298.72	6,354.65	6	6.00

It can be seen from the table above that risk free assets or risk free assets are the minimum lower limit as a basis for making investment decisions in the form of shares, it is known that UNVR 130.04 has a high return value during 2019 followed by UNTR by 128.12 The lowest return value during 2019 was in BMRI by minus 30.58 followed by KINO by minus 5.20 Risk free assets of 6% are the lower limit for investors in making investment decisions. However, the expected return ranking has not been able to satisfy investors to make stock investment decisions (M. Samsul, 2015)

Thus it can be concluded that the calculation results of CAPM show a fantastic increase for BBKA and INTP and vice versa for BMRI and KINO, CAPM also cannot predict stocks that have the potential to increase significantly but can assess a significant decline in stock performance such as ADHI, ANTM.

2. Single Index Model (SIM)

This method implies that the greater the return that will be received, the risk will also be much greater even compared to the risk of the portfolio formed. Then the expected return for each stock can be obtained as follows:

Tabel 2.
Expected Return with SIM

		30-Dec-18	29-Dec-19	β	Ri sim	In
1	ADHI	2,083	1,884	(0.25)	2,143	7.67
2	ADRO	1,685	1,865	0.17	1,733	7.46
3	ANTM	890	625	(0.23)	715,000	6.57
4	ASII	8,274	8,311	(0.01)	8,295	9.02
5	BBKA	15,520	21,910	7.20	18,227	9.83
6	BMRI	11,585	8,001	(4.22)	10,520	9.29
7	HMSP	3,835	4,374	0.40	3,920	8.29
8	ICBP	8,585	8,901	0.49	8,620	9.08
9	INTP	15,410	21,951	7.05	17,970	9.85
10	JSMR	4,321	6,410	2.47	5,345	8.59
11	KINO	3,032	2,121	(1.29)	2,319	7.78
12	KLBF	1,525	1,691	0.24	1,605	7.40
13	SHID	895	1,551	0.66	1,155	7.25
14	SMGR	9,185	9,902	1.53	9,695	9.19
15	SRIL	231	380	0.14	326,000	5.80
16	SSMS	1,410	1,502	(0.08)	1,565	7.45
17	TLKM	3,981	4,443	0.63	4,298	8.39
18	UNTR	21,251	28,524	13.99	28,524	10.27
19	UNVR	38,810	46,967	14.33	46,977	10.87
	IDX	5,298.72	6,354.65	-	6,743.07	8.66

From the above calculation results, it appears that by including the stock risk to the stock exchange, the expected return value changes. Stock risk to the stock exchange has a big effect on the expected return value. By using the SIM formula, the expected return of each stock can be obtained. Stock risk to the stock exchange is a consideration in making stock investment decisions.

From the table above, it can be seen that UNVR and UNTR stocks, which have the highest expected return, also have a high stock risk to the market. On the other hand, BMRI and KINO, which in the previous calculation had a bad value, then with an even minus risk, the expected return value obtained was the best. However, the expected return ranking has not been able to satisfy investors to make stock investment decisions.

It can be concluded that the calculation results from SIM without including risk free assets cannot show accurate results, especially on BBKA, BMRI, INTP, JSMR, SIM also cannot show a decrease in ADHI, ANTM, and KINO with the assumption that everything will be fine.

3. Arbitrage Pricing Theory (APT) Method

So that the expected return for each stock can be obtained as follows:

Tabel 3.
Expected Return with APT

		30-Dec-18	29-Dec-19	Inflasi	budep	Ri apt
1	ADHI	2,083	1,884	0.16	0.15	5.06
2	ADRO	1,685	1,865	(0.17)	(0.07)	6.78
3	ANTM	890	625	(0.06)	0.07	5.99
4	ASII	8,274	8,311	0.67	0.13	3.45
5	BBCA	15,520	21,910	(0.94)	(2.77)	16.85
6	BMRI	11,585	8,001	4.21	2.76	(15.55)
7	HMSP	3,835	4,374	(0.22)	(0.27)	7.49
8	ICBP	8,585	8,901	(0.09)	(0.17)	6.78
9	INTP	15,410	21,951	(0.31)	(2.46)	13.90
10	JSMR	4,321	6,410	(0.53)	(0.97)	10.47
11	KINO	3,032	2,121	(0.30)	0.31	6.13
12	KLBF	1,525	1,691	(0.00)	(0.06)	6.19
13	SHID	895	1,551	(0.00)	(0.24)	6.68
14	SMGR	9,185	9,902	(0.28)	(0.41)	8.09
15	SRIL	231	380	0.00	(0.05)	6.14
16	SSMS	1,410	1,502	0.28	0.07	4.89
17	TLKM	3,981	4,443	0.33	(0.07)	5.14
18	UNTR	21,251	28,524	(2.18)	(5.20)	27.75
19	UNVR	38,810	46,967	1.54	(4.70)	14.15
	IDX	5,298.72	6,354.65	(0.00)	(0.35)	6.99

From the calculation above, it appears that by including the inflation risk premium and the average government deposit interest rate risk premium, the expected return of the stock is obtained. By comparing the two risk premiums, the expected return of each stock shows the best results. This is because the variable comparison is not only with the stock risk to the market.

From the table above, it is known that the highest risk is held by BMRI 4.21 for inflation and 2.76 for average deposit interest while BMRI's only expected return is minus 15.52. This shows that BMRI is very sensitive to inflation risk and average deposit interest risk but has the lowest expected return. On the other hand, UNTR obtained the highest expected return of 27.75 with a risk to inflation of -2.18 and a risk to average deposit interest of -5.20 which shows that UNTR actually has a better performance if inflation increases and average deposit interest increases.

Thus, the calculation results of APT show how stocks that have good performance compared to bad ones, on BBCA. INTP, UNTR and UNVR appear that the performance is not that bad, the opposite for BMRI appears that the performance is not that bad, on the other hand, KINO turns out to be quite good performance despite a significant decline. (Definisi manajemen keuangan, n.d.)

Comparison of Calculation of Expected Rate of Return

Based on the results obtained from the calculation of the expected return between SIM, CAPM and APT can be compared as follows:

Tabel 4.
Comparison of Expected Return between SIM, CAPM and APT

	30-Dec-18	29-Dec-19	Ri sim	In	Ri capm	Ri apt
ADHI	2,083	1,884	2,143	7.67	3.89	5.06
ADRO	1,685	1,865	1,733	7.46	7.45	6.78
ANTM	890	625	715	6.57	3.99	5.99
ASII	8,274	8,311	8,295	9.02	5.89	3.45
BBCA	15,520	21,910	18,227	9.83	68.32	16.85
BMRI	11,585	8,001	10,520	9.29	(30.58)	(15.55)
HMSP	3,835	4,374	3,920	8.29	9.52	7.49
ICBP	8,585	8,901	8,620	9.08	10.45	6.78
INTP	15,410	21,951	17,970	9.85	67.05	13.90
JSMR	4,321	6,410	5,345	8.59	27.39	10.47
KINO	3,032	2,121	2,319	7.78	(5.20)	6.13
KLBF	1,525	1,691	1,605	7.40	8.09	6.19
SHID	895	1,551	1,155	7.25	11.75	6.68
SMGR	9,185	9,902	9,695	9.19	19.25	8.09
SRIL	231	380	326	5.80	7.25	6.14
SSMS	1,410	1,502	1,565	7.45	5.35	4.89
TLKM	3,981	4,443	4,298	8.39	11.47	5.14
UNTR	21,251	28,524	28,524	10.27	17.12	27.75
UNVR	38,810	46,967	46,977	10.87	130.04	14.15
IDX	5,298.72	6,354.65	6,743.07	8.66	6.00	6.99

From the calculation results above, it appears that by entering different comparison variables, different expected return values will be obtained. The movement of stock prices that continues to grow causes investors to make the best decisions in making stock investments.

From the table above, it is known that UNTR and UNVR have the highest expected return values whether calculated by SIM, CAPM or APT. BMRI, although it has a good expected return when calculated by SIM, has a poor value when calculated by CAPM or APT. What is unique is SRIL, with a small nominal value of shares but has a good expected return from all three calculation methods.(Bursa Efek Indonesia, 2016)

Thus, the three calculation methods mentioned above are mutually supportive and complementary. There is no better way of calculation between one and the other. This still depends on the full consideration of investors in making stock investment decisions.

Discussion

CAPM in using systematic risk (Beta), Sim relies on market risk while Apt involves inflation risk premium and deposit interest rates. In this factor significantly affects the calculation of the expected return for each stock. Regarding risk and return is an important core in this study in describing how certain stocks have high expected returns but have high risks such as UNVR and UNTR while other stocks have low expected returns but also low risks (such as BMRI and KINO). This reflects the basic principle in investment, which is the trade-off between risk and return.

Conclusion

This study aims to calculate the expected return of stocks using the Capital Asset Pricing Model (CAPM), Single Index Model (SIM), Arbitrage Pricing Theory (APT). Each valuation model produces different expected return values for the same stocks. These results underline that the model approach has a significant influence on the assessment of potential stock returns and risks. Stocks with high expected return potential tend to have higher risk, while stocks with

lower expected return tend to have lower risk. CAPM cannot predict stocks that have the potential to increase significantly but can assess a significant decline in stock performance such as ADHI, ANTM. While SIM without including risk free assets cannot show accurate results, especially on BBKA, BMRI, INTP, JSMR. SIM also cannot show a decline in ADHI, ANTM, and KINO assuming all will be fine. And for APT shows how stocks that have good performance compared to bad ones, on BBKA. INTP, UNTR and UNVR appear that the performance is not that bad, the opposite for BMRI appears that the performance is not that bad, on the other hand, KINO turns out to be quite good performance despite a significant decline.

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AN ANALYSIS OF THE IMPACT OF POPULISM ON FILIPINOS' POLITICAL AWARENESS THROUGH SOCIAL MEDIA PLATFORMS

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Abstract

This study is conducted to analyze the impact of populism on the political awareness of Filipinos through social media platforms. The influence of social media on the citizens' political beliefs provokes the mobilization of movements or enables polarization of political factions across the country. This paper also intends to highlight the utilization of populism in gaining the confidence and trust of the "netizen" through social media, which can affect the latter's political involvement, civic engagement, or even the outcome of a national or local election. Last 2022 national and local elections left a divided society that blemished the relationship between friends and family, which affected "unity" and the advocacy of the elected president. Thus, given its complex nature, the researchers utilized qualitative and quantitative methods to gauge the data collected properly and produce accurate results and interpretations. In the study's data-gathering phase, the researchers disseminated a comprehensive research survey questionnaire. They conducted a thorough interview with registered voters of the Philippines that further provided critical information to eventually land definitive answers to the questions associated with the study. Finally, the data gathered and related literature are analyzed, and arrived at substantive findings and conclusions can serve as a basis for future elections and research.

Keywords: Populism, Political Awareness, Social Media Platforms, Political Involvement, Civic Engagement

Introduction

The world has been quick to adjust and change from one aspect to another since the COVID-19 pandemic took place in December 2019, and politics is by no means an exception to this massive shift.

During the pandemic, politicking began as soon as the world started speculating on the locality of the virus' origin. The internet was filled with political content to the extent that it became a favorite topic among the citizens of the internet. This did not go unnoticed by those who wish to establish a reputation in today's political world, as it became one of the roots for populism to flourish.

Going back to the year 1998 – a time when social media had only started to sprout, one of the most known populist leaders in the Philippines is its former President, Joseph ‘Erap’ Estrada. With his tagline – “Erap Para sa Mahirap” (Erap for the Poor), he was able to pique the interest of millions of voters as these words showed both empathy and dedication for even the most ordinary Filipinos. This resulted in his win during the 1998 National Elections.

Such a phenomenon could also be observed during the recent years wherein technology and the internet has become relevant in today's society. One example could be traced back to another National Election in 2016, wherein former President Rodrigo Duterte found a unique way to relate with the Filipino people by using unrestrained provocative language, as well as his famous political campaign to end the illegal use of drugs in a span of three (3) to six (6) months.