The Investing Decisions during the COVID-19 Pandemic by Using the Capital Asset Pricing Model (CAPM) Method in LQ 45 Index Companies

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***Abstract**.*

Investors need to invest wisely because the Covid 19 pandemic has gone global, so that the stock exchange has also begun to waver. Therefore, several methods are needed to determine investment decisions. The purpose of this study is determining and risk analyzation and return in determining investment decisions during the COVID-19 pandemic using the CAPM method and classifying and assessing the LQ 45 index companies based on their undervalued and overvalued levels. This study uses the CAPM (Capital Asset Pricing Model) method and classifies and evaluates LQ 45 index companies based on the level of undervalued and overvalued. This type of quantitative descriptive research is the type of research applied in this study. In this study using saturated samples. Data processing was done using Microsoft Excel application program. The data analysis technique used is to calculate the stock return, market index return, beta and return expectations of the CAPM method. The results of the study by comparing the beta value with the expected return have an inversely proportional relationship. Of the 45 companies there are 20 Undervalued companies and 25 Overvalued companies.

Keywords: *CAPM (Capital Asset Pricing Model), beta, expected return*

1. INTRODUCTION

Indonesia's economic growth since the second quarter of 2020 has decreased quite significantly, namely by -5.32%. The main reason for this decline was that the government announced the first Covid 19 cases in Indonesia. So that the government made several policies to prevent transmission of the virus. These policies include implementing 3M (using masks, washing hands and maintaining a distance), then the government carries out PSBB and recommends WFH (Work From Home). With some of these policies, totally public activity, especially in the economic sector, stopped. This also has an impact on stock price trading in the capital market. Below is a picture of the development of the IHSG for the first and second quarters of 2020.

Source: (HOts Mirae Asset Sekuritas, 2020)

Fig.1. Development of IHSG for the first and second quarter of 2020

Based on Fig.1. it is known that the JCI in March 2020 was quite deep and had experienced halt trading. Many investors felt panic so that investors gave up their share ownership, which in the end, the JCI's lowest peak reached 3,911.72. However, in the following quarter, the JCI has begun to crawl up and investors have begun to believe that investors are starting to be optimistic and starting to carry out buying and selling transactions as usual [1]. One of the methods used to determine the risk and rate of return of an asset is the Capital Asset Pricing Model (CPAM). CAPM is designed to help investors select stocks and minimize risky investments. By implementing CAPM, investors can be helped in understanding the complex market conditions, minimizing investment risk and estimating the amount of return they will get, especially in this pandemic [2].

There are several previous studies that discuss CAPM, including Susanti, with the results of the study showing that there are 10 companies in an efficient state and 10 inefficient companies [3]. Furthermore, the research conducted by Hasan with the results of the study contained 11 inefficient companies and 19 efficient companies in the Business index company 27 [2]. Another case with the results of research conducted by Isnurhadi statistically with the results of the CAPM method can predict stock returns in JII companies with conventional companies at LQ 45 [4]. Furthermore, Putra and Yadnya's research results show that there are 15 company stocks that are undervalued, 5 company shares are overvalued [5]. According to the results of research conducted by Yulianti, Topowijono and Devi with the results of research that there are 6 company shares that are included in the efficient stock group and 1 company share is included in the inefficient stock group [6]. With some of these research results, the researcher is interested in conducting research on the object of the LQ 45 Index.

This study aims to use the CAPM method in determining and analyzing risk and return to determine investment decisions. During the COVID-19 pandemic and can classify and rate the LQ 45 index companies based on their undervalued and overvalued levels.

Literature Review
Return
Return is the result gotten from speculation. Returns can be within the frame of realized returns that have happened or anticipated returns that have not happened that are expected to happen within the future [7].

1. Realized Return or Ri

   Realized return is calculated based on chronicled information, this can be vital since it is utilized as a benchmark for company execution. Thus, this can be used as a benchmark for company performance.

2. Expected Return or E (Ri)

   Expected Return is the return that investors expect in the future. Contrary to realization, it means the return that has occurred, while the expected return means the expected return has not occurred [7].

   The formula for calculating the Stock Return (Ri) according to Hartono[7]

   $$R_i = \frac{P_t - P_{t-1}}{P_{t-1}}$$

   Where Ri is an individual stock return; Pt is the share price in period t and Pt-1 is the share price in period t-1

Risk
Risk is usually associated with deviations from the results received or expected. In the investment concept, risk can usually be divided into 2 categories namely

1. Systematic risk is macro risk, because it involves changes in the entire market and can cause changes in investment returns.

2. Unsystematic risk is the risk associated with changes in the risk of a particular company's micro condition, so that it will only affect the company's investment return. [7].

To calculate risk, a widely used method is the standard deviation used to measure the absolute deviation of a value that coincides with the expected value [7].

Composite Stock Price Index (IHSG)
Is a comprehensive index of all types of shares listed on the Stock Exchange. If the company's shares have increased while the JCI has also increased, then the shares have a positive correlation with the JCI. Therefore it is necessary to calculate the risk from the stock price with market risk or it can be called the stock beta (β) [8].

The formula for calculating the Stock Market Index (RM) according to Hartono[7]

$$R_M = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

http://ijstm.inarah.co.id

Where RM is the stock market rate of return; IHSGt is the Stock Price Index in period and IHSGt-1 is the Stock Price Index in period t-1.

Beta

In calculating CAPM, risk factors are very influential in determining the appropriate rate of return measurement. This risk is denoted by beta (β), with the following determination if the value of ß = 1 then there is a perfect relationship with the performance of all markets, such as the market index. Meanwhile, if ß <1.00 (Defensive Stock) then this stock will tend to experience lower fluctuations than the market index in general [9].

The formula for calculating beta (βi) according to Hartono[7]

$$\beta_i = \frac{\sigma im}{\sigma^2 m}$$

Where βi is the Stock Beta; σim is the covariance of market returns; σ2m is the market variant

Risk Free

Risk free or known as the chance free rate of return alludes to the rate of return on money related resources without risk. The intrigued rate for securities issued by the government is the estimation premise utilized, hereinafter alluded to as Bank Indonesia Certificates (SBI).

CAPM (Capital Asset Pricing Market)

There are several benchmarks that can be used to determine stock returns during the investment period. One of them is the CAPM (Capital Asset Pricing Market) method, where the CAPM incorporates the element of equity risk into the minimum return. The higher the stock risk, the greater the expected minimum stock return [8]. CAPM is a balanced model that can help simplify the relationship between benefits and risks that occur during very complex periods [9].

How to calculate E (Ri)

$$E(Ri) = Rf + \beta_i [E(R_M) - Rf]$$

Where E (Ri) is the expected rate of return, Rf is the risk-free rate of return; βi is the systematic risk level of each stock, E (RM) is the expected rate of return from the stock portfolio.

Security Market Lines

CAPM tries to explain the relationship between risk and rate of return. The concept of β (systematic risk) relationship with return is described by the Security Market Line (SML). The relationship between expected return and risk lies on the SML line.

II. METHODS

This type of quantitative descriptive research is the type of research applied in this research. The population in this study used data from the LQ 45 Index for the period February - July 2020. In this study using a saturated sample method. Data calculations

were performed using the Microsoft Excel application program. Techniques from data analysis include :
1. Calculating the Stock Return (Ri)
2. Calculating the Stock Market Index (R_M)
3. Calculating Rf
4. Calculating β
5. Calcutaing $E(R_i)$ CAPM

III. RESULT AND DISCUSSION
Results of the Analysis of Individual Stock Return Rate (Ri)

Ri can be calculated by subtracting this month's share price from the previous month's share price and comparing it to the previous month's share price. Following are the results of the calculation of individual stock returns for the LQ 45 Index for the period February - July 2020.

Table 1.Return of LQ 45 Index Company Individual Shares for the Period of Feb - July 2020

No	Issuer Code	Ri	No	Issuer Code	Ri
1	ACES	0,0894	24	INTP	-0,2417
2	ADRO	-0,0701	25	ITMG	-0,1241
3	AKRA	-0,0450	26	JPFA	-0,2302
4	ANTM	0,1010	27	JSMR	0,0873
5	ASII	-0,1060	28	KLBF	0,1741
6	BBCA	-0,0183	29	LPPF	-0,4826
7	BBNI	-0,2729	30	MNCN	-0,5768
8	BBRI	-0,2846	31	PGAS	-0,1021
9	BBTN	-0,0313	32	PTBA	-0,0723
10	BMRI	-0,1588	33	PTPP	-0,0494
11	BRPT	0,0167	34	PWON	-0,0531
12	BSDE	-0,0647	35	SCMA	0,0096
13	BTPS	-0,0127	36	SMGR	-0,1796
14	CPIN	0,0004	37	SRIL	-0,0071
15	CTRA	-0,0095	38	TBIG	0,2446
16	ERAA	0,0185	39	TKIM	-0,0206
17	EXCL	1,8603	40	TLKM	-0,2003
18	GGRM	-0,0731	41	TOWR	0,3609
19	HMSP	-0,1129	42	UNTR	0,1545
20	ICBP	-0,1793	43	UNVR	0,0813
21	INCO	0,1555	44	WIKA	-0,1770
22	INDF	-0,1603	45	WSKT	-0,4138
23	INKP	0,3197			

Source: Data processed by Microsoft Excel 2020

Based on the data above, it can be seen that the highest rate of return on shares (Ri) is found in the company PT XL Axiata, Tbk which is 1.8603 and for the lowest rate of return on shares (Ri) is found in the company PT Media Nusantara Citra, Tbk of -0 5768.

Market Returns Analysis Results

In calculating market returns, the IHSG is the market index used in this study, with the use of the JCI because it is considered capable of representing all stock transaction activities on the IDX.

Table 2. JCI Market Return for the January - July 2020 Period

Period	Close Price	R_M
Jan-20	5940,05	
Feb-20	5452,7	-0,082
Mar-20	4538,93	**-0,1676**
Apr-20	4716,4	0,0391
May-20	4753,61	0,00789
Jun-20	4905,39	0,03193
Jul-20	5149,63	**0,04979**
Amount		-0,1209
The highest score		0,04979
Lowest score		-0,1676
$E(R_M)$		-0,0202

Source: Data processed by Microsoft Excel 2020

Risk Free Analysis Results

BI interest rate data in this study is used as an indicator in calculating the level of risk free (Rf), the results of calculating the Risk Free Rate are as follows:

Table 3.Rf Calculation Results for the period Feb - July 2020

Tanggal	BI
20 Feb 2020	4,75%
19 Mar 2020	4,50%
14 Apr 2020	4,50%
19 Mei 2020	4,50%
18 Jun 2020	4,25%
16 Jul 2020	4,00%
Amount	26,50 %
The highest score	4,75 %
Lowest score	4,00 %
Average	4,42 %

Source: Data processed by Microsoft Excel 2020

Results of Systematic Risk Calculation Analysis for Individual Shares

The relationship between stock returns and market returns will be seen by calculating stock beta. Following are the results of the systematic risk calculation of 45 company stocks in this study.

Table 4. Results of Systematic Risk Calculation for Individual Shares (βi)

No	Issuer Code	Covar (Ri, Rm)	Var Rm	β (Beta)	No	Issuer Code	Covar (Ri, Rm)	Var Rm	β (Beta)
1	ACES	0,0416	0,0375	1,1095	23	INKP	0,1024	0,0375	2,7340
2	ADRO	0,0266	0,0375	0,7095	24	INTP	0,0268	0,0375	0,7145
3	AKRA	0,0756	0,0375	2,0186	25	ITMG	0,0466	0,0375	1,2443
4	ANTM	0,0751	0,0375	2,0031	26	JPFA	0,0585	0,0375	1,5607
5	ASII	0,0618	0,0375	1,6507	27	JSMR	0,0826	0,0375	2,2058
6	BBCA	0,0278	0,0375	0,7422	28	KLBF	0,0588	0,0375	1,5702
7	BBNI	0,0818	0,0375	2,1823	29	LPPF	0,0732	0,0375	1,9543
8	BBRI	0,0464	0,0375	1,2391	30	MNCN	0,0509	0,0375	1,3594
9	BBTN	0,1136	0,0375	3,0310	31	PGAS	0,1037	0,0375	2,7673
10	BMRI	0,0697	0,0375	1,8609	32	PTBA	-0,0018	0,0375	-0,0475
11	BRPT	0,0914	0,0375	2,4399	33	PTPP	0,1221	0,0375	3,2581
12	BSDE	0,0570	0,0375	1,5206	34	PWON	0,0802	0,0375	2,1392
13	BTPS	0,0850	0,0375	2,2689	35	SCMA	0,0530	0,0375	1,4136
14	CPIN	0,0516	0,0375	1,3767	36	SMGR	0,0868	0,0375	2,3171
15	CTRA	0,0023	0,0375	0,0611	37	SRIL	0,0692	0,0375	1,8481
16	ERAA	0,0936	0,0375	2,4991	38	TBIG	0,0776	0,0375	2,0716
17	EXCL	-0,2887	0,0375	-7,7065	39	TKIM	0,1169	0,0375	3,1201
18	GGRM	0,0430	0,0375	1,1481	40	TLKM	0,0209	0,0375	0,5580
19	HMSP	0,0474	0,0375	1,2646	41	TOWR	0,0586	0,0375	1,5628
20	ICBP	0,0063	0,0375	0,1687	42	UNTR	0,0257	0,0375	0,6855
21	INCO	0,0580	0,0375	1,5471	43	UNVR	0,0116	0,0375	0,3099
22	INDF	0,0184	0,0375	0,4911	44	WIKA	0,0968	0,0375	2,5828
					45	WSKT	0,1012	0,0375	2,7001

Source: Data processed by Microsoft Excel 2020

Based on table 4, it can be seen that the systematic risk value or the minimum beta (β) value is found in PT XL Xiata, Tbk at -7.7065. This means that the economic condition is in a depressed state so that the beta result is negative.

Results of the Calculation Analysis of the Expected Rate of Return

The level of return expected by investors from the stock investment made is called the expected rate of return [E (Ri)]. The results of the E (Ri) calculation are as follows:

Table 5 Calculation Results [E (Ri)]

No	Issuer Code	E(Ri) CAPM	No	Issuer Code	E(Ri) CAPM
1	ACES	-0,02241	23	INKP	-0,05586
2	ADRO	-0,01417	24	INTP	-0,01427
3	AKRA	-0,04113	25	ITMG	-0,02518
4	ANTM	-0,04081	26	JPFA	-0,0317
5	ASII	-0,03355	27	JSMR	-0,04499
6	BBCA	-0,01484	28	KLBF	-0,0319
7	BBNI	-0,0445	29	LPPF	-0,03981
8	BBRI	-0,02508	30	MNCN	-0,02755
9	BBTN	-0,06198	31	PGAS	-0,05655
10	BMRI	-0,03788	32	PTBA	0,00142
11	BRPT	-0,04981	33	PTPP	-0,06666
12	BSDE	-0,03088	34	PWON	-0,04361
13	BTPS	-0,04629	35	SCMA	-0,02867
14	CPIN	-0,02791	36	SMGR	-0,04728
15	CTRA	-0,00082	37	SRIL	-0,03762
16	ERAA	-0,05103	38	TBIG	-0,04222
17	EXCL	0,159155	39	TKIM	-0,06382
18	GGRM	-0,0232	40	TLKM	-0,01105
19	HMSP	-0,0256	41	TOWR	-0,03174
20	ICBP	-0,00303	42	UNTR	-0,01368
21	INCO	-0,03142	43	UNVR	-0,00594
22	INDF	-0,00967	44	WIKA	-0,05275
			45	WSKT	-0,05517

Source: Data processed by Microsoft Excel 2020

Data from table 5 shows that there is a negative relationship between expected returns and systematic risk or beta, which means that the higher the expected return, the investors will get a lower risk of the stock.

Security Market Line (SML) Graph

Graphical depiction of the CAPM model can be seen by creating a Security Market Line (SML) Graph. The magnitude of the systematic risk relationship (Beta) with the Expected Return is depicted in Graph. The following is an SML chart of 45 LQ 45 Index stocks
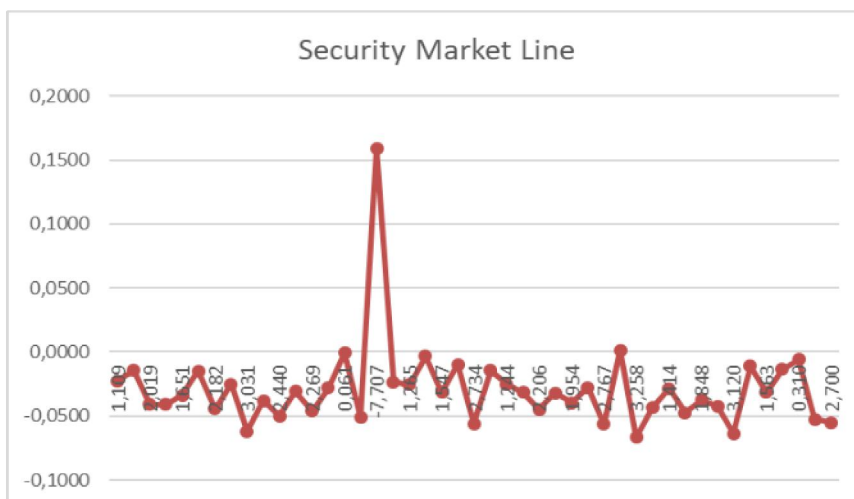
Source: Data processed by Microsoft Excel 2020

Fig. 2. Security Market Line (SML) Graph

Fig.2. can explain that there is a negative relationship between expected returns and systematic risk (beta), which means that the greater the rate of return, the lower the systematic risk received by investors. For companies that have a greater systematic value (beta). This can be seen in the company PT XL Axiata, Tbk, which has a return value of 0.1592 and a systematic risk value (beta) of -7.707. In other words, this stock is a defensive stock, which means that this stock has a high level of sensitivity to market changes.

From the calculation results, it can be concluded that in β obtained has a value inversely proportional to return, which means that the lower the risk level, the higher the expected rate of return.

Classification of Shares

Based on the calculations that have been done previously, the shares can be classified by comparing Ri with E (Ri) CAPM. If the value of Ri> E (Ri) CAPM then the stock can be classified as an undervalued stock. Meanwhile, if the value of Ri <E (Ri) CAPM, the stock can be classified as an Overvalued stock. The following shows the classification data for the LQ 45 Index Shares as follows:

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Table 6. Classification of LQ 45 Index Shares

No	Issuer Code	Ri	E (Ri) CAPM	Result	Score	Decision
1	ACES	0,0894	-0,0224	Ri > E(Ri)	Undervalued	Buy / Hold
2	ADRO	-0,0701	-0,0142	Ri < E(Ri)	Overvalued	Sell
3	AKRA	-0,0450	-0,0411	Ri < E(Ri)	Overvalued	Sell
4	ANTM	0,1010	-0,0408	Ri > E(Ri)	Undervalued	Buy / Hold
5	ASII	-0,1060	-0,0336	Ri < E(Ri)	Overvalued	Sell
6	BBCA	-0,0183	-0,0148	Ri < E(Ri)	Overvalued	Sell
7	BBNI	-0,2729	-0,0445	Ri < E(Ri)	Overvalued	Sell
8	BBRI	-0,2846	-0,0251	Ri < E(Ri)	Overvalued	Sell
9	BBTN	-0,0313	-0,0620	Ri > E(Ri)	Undervalued	Buy / Hold
10	BMRI	-0,1588	-0,0379	Ri < E(Ri)	Overvalued	Sell
11	BRPT	0,0167	-0,0498	Ri > E(Ri)	Undervalued	Buy / Hold
12	BSDE	-0,0647	-0,0309	Ri < E(Ri)	Overvalued	Sell
13	BTPS	-0,0127	-0,0463	Ri > E(Ri)	Undervalued	Buy / Hold
14	CPIN	0,0004	-0,0279	Ri > E(Ri)	Undervalued	Buy / Hold
15	CTRA	-0,0095	-0,0008	Ri < E(Ri)	Overvalued	Sell
16	ERAA	0,0185	-0,0510	Ri > E(Ri)	Undervalued	Buy / Hold
17	EXCL	1,8603	0,1592	Ri > E(Ri)	Undervalued	Buy / Hold
18	GGRM	-0,0731	-0,0232	Ri < E(Ri)	Overvalued	Sell
19	HMSP	-0,1129	-0,0256	Ri < E(Ri)	Overvalued	Sell
20	ICBP	-0,1793	-0,0030	Ri < E(Ri)	Overvalued	Sell
21	INCO	0,1555	-0,0314	Ri > E(Ri)	Undervalued	Buy / Hold
22	INDF	-0,1603	-0,0097	Ri < E(Ri)	Overvalued	Sell
23	INKP	0,3197	-0,0559	Ri > E(Ri)	Undervalued	Buy / Hold
24	INTP	-0,2417	-0,0143	Ri < E(Ri)	Overvalued	Sell
25	ITMG	-0,1241	-0,0252	Ri < E(Ri)	Overvalued	Sell
26	JPFA	-0,2302	-0,0317	Ri < E(Ri)	Overvalued	Sell
27	JSMR	0,0873	-0,0450	Ri > E(Ri)	Undervalued	Buy / Hold
28	KLBF	0,1741	-0,0319	Ri > E(Ri)	Undervalued	Buy / Hold
29	LPPF	-0,4826	-0,0398	Ri < E(Ri)	Overvalued	Sell
30	MNCN	-0,5768	-0,0276	Ri < E(Ri)	Overvalued	Sell
31	PGAS	-0,1021	-0,0565	Ri < E(Ri)	Overvalued	Sell
32	PTBA	-0,0723	0,0014	Ri < E(Ri)	Overvalued	Sell
33	PTPP	-0,0494	-0,0667	Ri > E(Ri)	Undervalued	Buy / Hold
34	PWON	-0,0531	-0,0436	Ri < E(Ri)	Overvalued	Sell
35	SCMA	0,0096	-0,0287	Ri > E(Ri)	Undervalued	Buy / Hold
36	SMGR	-0,1796	-0,0473	Ri < E(Ri)	Overvalued	Sell
37	SRIL	-0,0071	-0,0376	Ri > E(Ri)	Undervalued	Buy / Hold
38	TBIG	0,2446	-0,0422	Ri > E(Ri)	Undervalued	Buy / Hold
39	TKIM	-0,0206	-0,0638	Ri > E(Ri)	Undervalued	Buy / Hold
40	TLKM	-0,2003	-0,0111	Ri < E(Ri)	Overvalued	Sell
41	TOWR	0,3609	-0,0317	Ri > E(Ri)	Undervalued	Buy / Hold
42	UNTR	0,1545	-0,0137	Ri > E(Ri)	Undervalued	Buy / Hold
43	UNVR	0,0813	-0,0059	Ri > E(Ri)	Undervalued	Buy / Hold
44	WIKA	-0,1770	-0,0527	Ri < E(Ri)	Overvalued	Sell
45	WSKT	-0,4138	-0,0552	Ri < E(Ri)	Overvalued	Sell

Source: Data processed by Microsoft Excel 2020

Based on table 6, it can be seen that there are 20 companies whose shares are classified as Undevalued, while 25 other companies are classified as Overvalued. Thus it can be concluded that at times like this, investors need to purchase shares, especially in companies that are included in the undervalued group. This is because these investors have a great opportunity to get high returns in the future. Furthermore, investors who already have overvalued shares should sell these shares in order to prevent investors from experiencing greater risks in the future.

IV. CONCLUSION

Based on the results of the study by comparing the value of β with E (Ri), it has an inverse relationship, this means that the higher the value of β, the lower the E (Ri) and vice versa. Of the 45 companies, there are 20 Undervalued companies and 25 Overvalued companies.

It is hoped that further researchers will be able to develop methods used to make investment decisions such as using the Single Index Model, APT so that it can be expected to be able to make comparisons in terms of making investment decisions. For further research it is expected to increase the research period and change the object of research.

V. ACKNOWLEDGMENTS

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