The Accuracy of Balance Model in Predicting Stock Investment During The Covid-19 Pandemic on LQ 45 Index

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Abstract. *In investing, an investor certainly avoids risk; thus, the investor needs a model in making predictions to forecast the return of shares. There are two models to predict this: Capital Asset Pricing Capital (CAPM) and Arbitrage Pricing Theory (APT). This study aims to find out which models are more accurate in determining investment options, especially during the Covid-19 pandemic in companies included in the LQ 45 Index group. The population in this study is 50 companies listed in LQ 45 from February 2020 - July 2021. The sampling technique used in this study is purposive sampling. The data used in this study will be processed through Ms Excel and SPSS Version 21. The data analysis techniques used in this study are the Basic Assumption Test consisting of Normality Test and Homogeneity Test, Mean Absolute Deviation (MAD), and hypothesis testing consisting of independent t-test samples. The results in this study show that the Model is accurate in predicting stock returns in the Covid-19 pandemic is a CAPM model this is because the value of MAD CAPM is smaller than mad APT. Furthermore, independent t-test samples showed that H0 was rejected, which meant a difference in accuracy between CAPM and APT in calculating the return of LQ 45 shares. The implication of this study is expected to provide references to investors and potential investors as a source of information in decision making to make investments in this pandemic period.*

Keyword: *Capital Asset Pricing Model; Arbitrage Pricing Theory; stock return*.

Abstrak. Dalam melakukan investasi, seorang investor pastinya menghindari adanya risiko dengan demikian investor memerlukan suatu model dalam melakukan prediksi untuk meramalkan retur saham. Terdapat dua model untuk memprediksi hal tersebut antara lain *Capital Asset Pricing Modal* (CAPM) dan *Arbitrage Pricing Theory* (APT). Tujuan dari penelitian ini mengetahui model mana yang lebih akurat dalam menentukan pilihan berinvestasi terutama di masa masa pandemi Covid-19 pada perusahaan yang masuk pada kelompok indeks LQ 45. Populasi pada penelitian ini yaitu seluruh perusahaan yang terdaftar di LQ 45 periode Februari 2020–Juli 2021 yakni sebanyak 50 populasi. Teknik pengambilan sampel yang digunakan dalam penelitian ini yaitu *sampling purposive.* Data yang digunakan dalam penelitian ini akan diolah melalui aplikasi Ms.Excel dan SPSS Versi 21. Teknik analisis data yang digunakan dalam penelitian ini yaitu uji asumsi dasar yang terdiri dari uji normalitas dan uji homogenitas, *mean absolute diviation* (MAD) serta pengujian hipotesis yang terdiri dari *independent sampel t-test.* Hasil dalam penelitian ini menunjukkan bahwa model yang akurat dalam memprediksi retur saham di masa pandemi Covid-19 ini adalah model CAPM, hal ini disebabkan nilai MAD CAPM lebih kecil dibandingkan dengan MAD APT. Selanjutnya, hasil *independent sampel t-test* menunjukkan bahwa H_0 ditolak yang berarti terdapat perbedaan akurasi antara CAPM dan APT dalam menghitung retur saham LQ 45. Implikasi penelitian ini diharapkan mampu memberikan referensi kepada para investor dan calon investor sebagai sumber informasi dalam pengambilan keputusan untuk melakukan investasi di masa pandemic Covid-19 ini

Kata Kunci: *Capital Asset Pricing Model; Arbitrage Pricing Theory; retur saham.*

Introduction

When the government announced the first case of Covid-19 in Indonesia, the most significant impact was the decrease in Indonesia's economic growth of -5.32%. In facing this pandemic, various policies are carried out by the government to improve the economy, among others, by implementing 5M, conducting PSBB, advocating for Work From Home (WFH), and PPKM (The Imposition of Restrictions on Community Activities) up to level 4. The extension of the PPKM policy will cause Indonesia's economic growth to slow down from the previous projection. Therefore, since the beginning of the year, Indonesia's GDP has only grown in the range of 3.5% (Sidik, 2021). Of course, this event also impacts share's trading in the capital market. If we look at the performance of the Composite Stock Price Index (JCI), which is still rising in recent months, and the Rupiah exchange rate against the United States Dollar, which has also strengthened in the last two weeks and remains below Rp14,500/US$ (Fernando, 2021). The following is presented a picture of the development of the Composite Stock Price Index (IHSG) Period February 2020 to July 2021:

Figure 1. IHSG Development Period February 2020 to July 2021

Source : HOts Mirae Asset Sekuritas (2021)

Based on Figure 1, the known Composite Stock Price Index (IHSG) in March 2020 is quite deep and has experienced halt trading. Many investors felt panic, and they relinquished their shareholdings, which in the end, the lowest point of JCI touched the value of 3,911.72. Nevertheless, for the next quarter IHSG has started to crawl up, and investors have started to believe where investors have started to be optimistic and start doing trade transactions as usual (Indonesia, 2020). Data obtained from PT Kustodian Sentral Efek Indonesia (KSEI) explained that since January 2021, the number of capital market investors has increased significantly. It indicates that people have turned to capital market businesses rather than real ones currently experiencing a downturn (DJKN, 2021).

The capital market can also be referred to as abstract market because this market brings together over-funded parties (investors) with parties who need funds (issuers) by selling securities (Tandelilin, 2010). Investors expect a return in both yield and capital gain/loss. Thus, investors need to have the right

investment considerations in arranging the proper portfolio preparation to obtain the expected return. The preparation of this portfolio can be done with two models often used by investors, namely Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Model (APT). Financial management experts still debate both models' accuracy in predicting risks and returns (Safitri et al., 2018).

There have been several previous studies that discuss the accuracy of the balance model in determining investment, namely research conducted by (Östermark, 1990) (Juwana, 2015), (Laila & Saerang, 2015), and (Pham, 2020) with results indicating that APT is a more accurate model used in the calculation of the expected return of shares compared to CAPM. While according to (Lemiyana, 2015), (Indra, 2018), (Safitri et al., 2018), and (Muhammad, 2019) with the results of the study showed that the CAPM model is more accurate in predicting stock return when compared to APT. This study seeks to analyze which balance model is more accurate in predicting stock investments and determine the differences in the accuracy of the Capital Asset Pricing Model (CPAM) and Arbitrage Pricing Theory (APT) models in determining investment options. Thus investors can take action in investing based on the accuracy of both models to reduce the risk faced by investors so that there are no losses in investing, especially during the Covid-19 pandemic in companies included in the LQ 45 Index group.

CAPM was first developed by Sharpe & Cooper (1972), Lintner (1969), and Mossin (1969). This model associates the level of expectorant return with the return of an asset at risk in a balanced market situation (market equilibrium) (Susanti et al., 2021). This CAPM model can help investors sort stocks with a reasonably complex market situation, speculate on the expected level of return, and minimize the risks (Hasan et al., 2019). According to Tandelilin (2010), CAPM models in finding the estimated return level are:

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

Information:

$E(R_i)$ = Expected rate of return

Rf = Risk-Free rate of return

Bi = The systematic level of risk of each stock

$E(R_M)$ = expected return from stock portfolio

While Stephen Ross developed the APT model in 1976, Ross suggests that various factors can influence the price of an asset. According to Akpo et al. (2015), APT is based on five basic assumptions, namely:

1. Capital market in a perfect competition situation;
2. Each Investor has similar expectations for return on each share;
3. The expectation of this return originates from several (n) factors that affect linearly;
4. Loading factor accommodates all systematic risks of the analyzed assets so that term errors are not correlated cross-sectionally or time series; and
5. The number of systematic factors is much less when compared to some of the assets analyzed.

According to Tandelilin (2010), the APT model in calculating the expected return is

$$E(Ri) = a_0 + b_{i1}F_1 + b_{i2}F_2 + \ldots\ldots\ldots + b_{in}F_n$$

Information:

$E(Ri)$ = Return of expectations of the i

a_0 = Return expectation of the security if the systematic risk is zero

b_{in} = Coefficient indicating the magnitude of the influence of n factors on the return of the security i

F = Risk premium for a factor (e.g., the risk premium for F is $E(F_1) - a0$

APT is influenced by several risk factors that prove the economic situation

in the usual way or can also be spoken as a macro-economic variable in estimating the level of return expectations of security. (Gusni & Riantani, 2017). Macroeconomic variables include:

1. Inflation

Inflation is a tendency to increase product prices by means of totality. Large inflation rates are usually associated with overheated economic situations (Tandelilin, 2010). This point indicates that the economic situation faces demand for products that exceed the capacity of its product offerings; as a result, price tends to increase (Susanti et al., 2020). There are aspects of inflation formation, among others:

1) The high number of requests for special product types. When demand rises, but limited stock/supply will increase the price.
2) Rising the production costs. The main trigger is the soaring price of basic raw materials or worker rewards.
3) When the amount of money in the community increases to double, the price of goods will also increase equally.

2. Bank Indonesia Interest Rate (BI Rate)

Bank Indonesia's Interest Rate (BI Rate) is a reference interest rate inaugurated by Bank Indonesia through the monthly Board of Governors Meeting. The BI Rate is announced to the public to reference credit interest rates. Therefore, the interest rate of banking and financing companies (leasing) is strongly influenced by the BI rate for credit transactions. High-interest rates will affect the present value of the company's cash flow so that the opportunity to invest is no longer attractive.

3. Exchange rate

Exchange rates are one of the spectra that steals attention, especially for people who often make expeditions abroad or people who want foreign currency. The exchange rate can be defined as an agreement related to the currency exchange rate against the current or future payment.

So it can be concluded that Inflation, BI Rate, and exchange rate are macroeconomic factors that can affect a company's shares. The higher the inflation rate, BI Rate, and exchange rate, the lower the share price (Ramadhan & Azhari, 2020)

After this study calculates the return based on CAPM and APT, the next step is to do Mean Absolute Deviation (MAD). The accuracy of CAPM and APT models in stock return prediction can be measured by absolute deviation average or MAD. Calculating MAD is to find the average absolute value of the difference between the actual stock return and its expectations. In this study, the model's accuracy was measured using MAD, provided that the smaller the VALUE of MAD, this indicates that the model is more accurate. Measuring the accuracy of the CAPM and APT models, MAD values are calculated with the formula:

$$MAD = \frac{\sum [R_i - E(R_i)]}{n}$$

Information:

Ri = Actual Stock Return
E(Ri) = Expected Stock Return
n = Amount of data

Research Methods

This research approach is quantitative, using the case study research model. A case study is one of the models often used in finance and capital market research. This study uses data in the stock price list (closing price), LQ 45 data, and BI interest rates, Inflation, and Exchange Rates.

Population and Samples

The population in this study is 50 companies registered in the LQ 45 period of January 2020–July 2021. The sampling technique used in this study is purposive sampling. Purposive sampling is a sampling of data based on specific criteria. The criteria of this purposive sampling is

that companies registered in LQ 45 period February 2020–July 2021 are companies that remain consistently included in the LQ 45 index. From these criteria obtained, 40 companies listed in the LQ 45 Index will be sampled in this study.

Variable and Research Data

The data used in this study is secondary data, obtained from www.IDX.co.id, www.bi.go.id, and www.investing.com websites. Research data used is monthly data for 18 months, namely February 2020 to July 2021. Here is the description of variable data that can be seen in Table 1:

Table 1. Description of Research Variables

No	Variable	Data Description	Formula
1	Actual Return (R_i)	Return of each share in each period	$R_i = \frac{P_t - P_{t-1}}{P_{t-1}}$
2	Expected Return ($E(R_i)$)	The expected return of each share	$E(R_i) = \frac{\sum_{i=1}^{n} R_i}{n}$
3	Risk-Free Return (Rf)	Return obtained based on SBI Interest Rate	$R_f = \frac{X_{SBI}}{12}$
4	Return Market (R_M)	Return obtained from IHSG every period	$R_M = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$
5	Inflation ($F_{Inflation}$)	Change in the inflation rate from the previous period	$F_{Inflasi} = \frac{Inflation_t - Inflation_{t-1}}{Inflation_{t-1}}$
6	SBI (F_{SBI})	Changes in SBI levels from the previous period	$F_{SBI} = \frac{SBI_t - SBI_{t-1}}{SBI_{t-1}}$
7	Exchange Rate(F_{Kurs})	Change in Exchange Rate from the previous period	$F_{kurs} = \frac{\text{Exchange Rate}_t - \text{Exchange Rate}_{t-1}}{\text{Exchange Rate}_{t-1}}$

Analysis Methods

The data used in this study will be processed using Ms. Excel and SPSS Version 21. Analysis of this research data can be explained by several stages, namely:

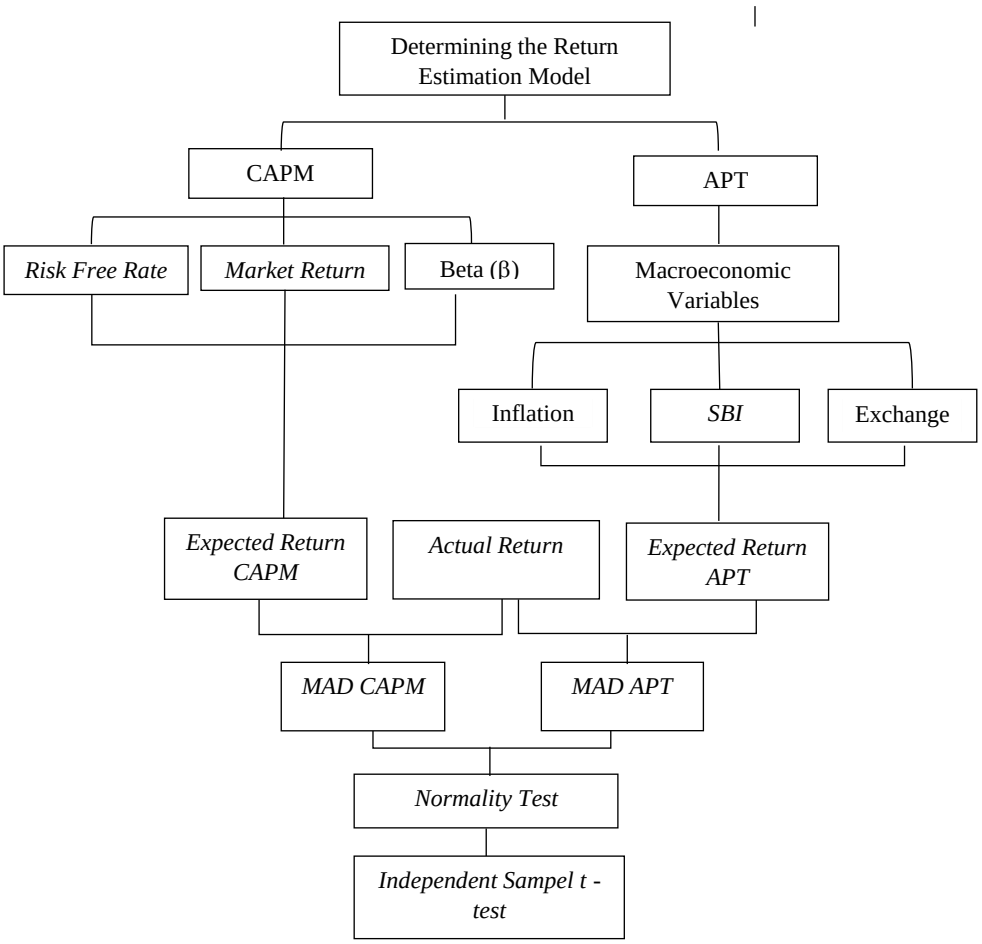
1. Collect data related to CAPM:
   1) Calculating the stock return, market return, and risk-free asset return in February 2020–July 2021.
   2) Looking for the systematic risk value of stocks or beta stocks.
   3) Establish a CAPM balance model, and the latter calculates the return of expectations based on the CAPM model.
2. Collect data related to APT:
   1) Calculate the return of stocks and calculate the actual rate of change of macroeconomic variables.
   2) Calculate the expected rate of change from macroeconomic variables' actual variable change rate data. The way to calculate this rate of change is to use the Exponential Smoothing method in SPSS Software 21.

3) Calculate the changes in unexpected macroeconomic factors.
4) Furthermore, the calculation of the sensitivity value of stock return to macroeconomic factors for the APT model by repressing the actual return of shares with macroeconomic factors in February 2020–July 2021.
5) Establish an APT balance model.
6) Calculate return expectations based on the APT model.

3. Calculate the average MAD absolute deviation from each CAPM and APT model to see the accuracy level in predicting stock returns.
4. Compare MAD CAPM and MAD APT averages to determine which capital is more accurate in predicting stock returns.
5. A normality test is done to determine if the data is normally distributed or not with the provisions of asymp value. Sig > 0.05
6. Levene Test for Diversity Similarity.
7. Independent Test t-test sample
   The hypothetical form for independent t-test samples in this study is
   H_0: There was no significant difference in accuracy (MAD value) between CAPM and APT in predicting LQ 45 stock returns.
   H_1: There is a significant difference in accuracy (MAD value) between CAPM and APT in predicting the return of LQ 45 shares.
8. Make a decision

Based on the stages described above, the frame of mind can be seen in Figure 2.

Figure 2. Conceptual Framework



Results and Discussion

Results

Capital Asset Pricing Model (CAPM)

Return of Shares

This study used monthly closing price data of LQ 45 shares in February 2020–July 2021. Based on A1 (see appendix), it can be known that 21 companies have a negative return on shares. However, investors' response is still positive because the highest return of shares is found in PT Aneka Tambang Persero, Tbk (ANTM), which has a return of 1.6996. In comparison, the lowest return is found in the company PT Media Nusantara Citra, Tbk (MNCN), which has a return of -0.5127.

Return Market

The market index used in this study is the Composite Stock Price Index (IHSG) which is taken based on monthly closing price data in February 2020–July 2021. Table A2 (see appendix) indicates that the return market fluctuates and has a negative value; this indicates a risk. Although the return is negative several times, IHSG is still considered good because it has a positive average value of 0.00218.

Systematic Risk (Beta)

The research calculations concluded that all companies have a beta that is of positive value. It means that a rise in market returns will increase the return of shares. Table A3 (see appendix) will explain the beta value of each company's shares.

Expected Return CAPM

The next step is to calculate the average expected return of shares calculated by the Capital Asset Pricing Model (CAPM) method. Based on table A4 (see appendix), the highest expected return value is 0.0357 in PT Indofood CBP Sukses Makmur, Tbk (ICBP), while the lowest expected return value is PT PP Persero Tbk (PTPP) of -0.0759.

Arbitrage Pricing Theory (APT)

Macro-Economic Variables

This study uses Surprise Interest Rate, Surprise Inflation, and Surprise Exchange Rate obtained through the difference between the actual value of macro factors and expected return value. The method used to find the Expected Value of macro factors uses the Exponential Smoothing method with the help of SPSS 21 software. Provided that MAPE and MAE values are lower than each of these methods.

Systematic Risk (Beta) APT

This APT model has a systematic risk that is different from CAPM because, in an APT method, the risk is systematically obtained from the sensitivity of stock return to macro factors of economists, along with the results obtained

1. Based on the beta calculation of inflation results, 19 companies have negative beta values. It suggests that stock returns will move in the opposite direction to rising inflation, meaning that an increase in inflation could lead to a decline in stock returns. In addition, 21 companies have a positive beta value, indicating that increasing inflation will increase 21 shares. The lowest inflation beta value was in PT Aneka Tambang, Tbk (ANTM) company of -3,8354, while the highest inflation beta value was in PT Unilever, Tbk (UNVR), which was 1,28951.
2. SBI beta calculation results have 19 companies that have negative beta values. It indicates that an increase in SBI will result in a decrease in stock returns. In addition, 21 companies have a positive beta value, indicating that an increase in SBI will increase stock returns. The lowest SBI beta value was in PT Aneka Tambang, Tbk (ANTM) company of -4, 649, while the highest SBI beta value was in PT Unilever, Tbk (UNVR), which was 1,5629.

3. The result of the beta exchange rate is 19 companies that have negative beta values. It indicates that if there is depreciation of the Rupiah against the dollar, it will decrease the return of stocks. While 21 companies have a positive beta value, this indicates that depreciation of the Rupiah against the dollar will increase stock returns. The lowest rate beta value is in PT Aneka Tambang, Tbk (ANTM) company of -0,0383, while the highest rate beta value is in PT Unilever, Tbk (UNVR), which is 0,0129.

Expected Return by using APT Models

After obtaining systematic risk results (beta) from each macroeconomic factor, the average value of the expected return of shares is calculated using the Arbitrage Pricing Theory (APT) Model.

Based on Table A5 (see appendix), the highest expected return value is in PT Unilever Tbk (UNVR), which is 0.4576, while the lowest expected return value is in PT Aneka Tambang Tbk (ANTM) company of -1.2025.

Comparison of CAPM and APT Models

Once it is known the value of the expected return of each model then the next step is done a comparison to know which method is better in calculating the return of LQ 45 shares, then the way is done is to use the Mean Absolute Deviation (MAD) method of both models.

Table A6 (see appendix) shows that the value of MAD CAPM < MAD APT value of 0.0857 < 0.1853, so it can be concluded that the CAPM model is more accurate than the APT models in determining the option to invest there LQ 45 shares.

Hypothesis Test

The next step is to compare the two MAD values with the independent sample t-test using SPSS 21. However, before doing so, it is necessary to test normality to determine whether or not this data is feasible to be researched.

From Table A7 (see appendix), it is known that the value of Asymp. Sig (2-tailed) is normally distributed because it has a value greater than 0.05 (0.201 > 0.05 and 0.216 > 0.05). Because the data has been distributed normally, it can be done the t-test.

The results of the independent calculation of t-test samples can be seen in Table A8 (see appendix). Based on the data processing shown in Table A8 of Levene's Test results obtained a Sig value of 0.000 which is smaller than the value of $\alpha = 0.05$, then H_0 is rejected, which indicates that the assumption of both variants is equal variance assumption is not met, then the test t-test using the assumption of equal variance not assumed. Thus the results of independent sample t-test assuming equal variance not assumed, then the result is H0 rejected because the value of Sig is smaller than the level of significance of 0.000 < 0.05 and the calculated t value > t table with a value of 5,246 > 2.02108. So it can be concluded that there is a significant accuracy difference between CAPM and APT in predicting the return of LQ 45 shares.

Discussion

Systematic Risk Relationship (β) and Expected Rate of Return with CAPM Model

This research proves that CAPM can help investors make decisions in investing to estimate the expected level of profit by paying attention to the extent of systematic risk. In addition, CAPM is also used to measure the relationship between the rate of return of investment and the rate of return of the market. Based on the results of the study, the relationship between systematic risk is inversely proportional to the company's expected to return with the result that the highest beta value is in PT PP Persero Tbk (PTPP) company of 3.0725 while the lowest expected return is in PT PP Persero Tbk (PTPP) company of -0.0759 which means that the higher the systematic risk, the

lower the rate of return received by investors. It is not in accordance with the results of research conducted by Susanti et al. (2021) and Yullianti et al. (2016) with the result that the systematic risk value (β) obtained has a value directly proportional to the return, which means the higher the value of the β then the rate of return of the stock (E(Ri)) will be high as well. It is strengthened by opinion Boďa & Kanderová (2014), which states that the CAPM is one of the underlying building blocks of Modern Portfolio Theory and is constructed on many strong theoretical assumptions concerning the behaviour of financial markets and investors. Consequently, this model establishes a linear relationship of risky assets returns excess of the riskless rate to market portfolio returns excess of the riskless rate.

Systematic Risk Relationship (β) and Expected Rate of Return with APT Model

APT uses the thought that two investment opportunities with identical characteristics cannot be sold at different prices. The concept used is the law of one price, and in APT systematic risk needs to be considered from several macroeconomic variables. Based on the results of the study, the relationship between systematic risk and expected return with the APT model is directly proportional to the result that the lowest Beta value both in terms of inflation, SBI, and exchange rates is found in pt Aneka Tambang, Tbk (ANTM) with a value of -3.8354; -4,649; -0.0383 as well as the value of the company's expected return of -1.2025. It is in accordance with the results of research conducted by Susanti et al. (2021), and Yullianti et al. (2016) with the result that the systematic risk value (β) obtained has a value directly proportional to the return, which means the higher the value of the β then the rate of return of shares (E(Ri)) will be high as well. It is strengthened by the opinion of Cortés & Porras (2014), which state that the APT is very sensitive to the number of factors extracted and the periodicity and expression of the models. The APT reveals the presence of priced, pervasive statistical risk factors in many models and seven models that completely fulfilled all the requirements for accepting the APT pricing.

Comparison of The Accuracy of CAPM and APT Models in Predicting Stock Investments

Based on the research results that have been done, this shows that MAD CAPM's value is smaller than MAD APT. Thus it can be concluded that the CAPM model is more accurate than the APT Model in predicting stock investments in this pandemic period. The paired sample difference between MAD CAPM and MAD APT has a sig value of 0.000; this result is in accordance with the hypothesis that H0 is rejected, which shows a significant difference in accuracy between CAPM and APT. This difference occurs because the CAPM model uses free asset risk, market return, and beta so that this model makes it easier for investors to forecast stock returns while the APT model of investors needs to look again in detail about macroeconomic factors such as inflation, BI interest rates and exchange rates that can affect changes in stock prices.

These results follow the research conducted by Muhammad (2019) and Indra (2018). It shows that CAPM is more accurate when compared to APT. It is because CAPM uses market beta obtained from the return market where the measure of risk is an indicator that affects stocks. While the APT model cannot explain the variation in stock income caused by macroeconomic variables. In addition, the Beta Inflation, SBI, and exchange rate values are negative, so this reduces the accuracy of the APT model. It is also strengthened by Akpo et al. (2015), who argues that the attraction of the CAPM is that it offers powerful and intuitive predictions about how to measure risk and

the relation between expected return and risk. However, the empirical verification of the risk-return relationship shows the mean-variance efficiency of the market proxy (Pham, 2020), and the main contribution of the CAPM is that the returns on stocks depend only on the market.

From the discussion, researchers saw that economic conditions during the Covid-19 pandemic showed inconsistent results that made unstable and sensitive macroeconomic variables during the period January 2020 to July 2021 in the LQ Index 45. It can be known from calculating the beta value of Inflation, SBI, and Negative Rate. Therefore, the suitable balance model in helping investors in this pandemic period make investments is by using the CAPM model because this model can reflect all things related to valuable assets and risks and relationships.

Conclusion

The results showed that the accurate model in predicting stock returns during the Covid-19 pandemic is the Capital Asset Pricing Model (CAPM); this is due to the value of MAD CAPM is smaller than MAD APT. In addition, the independent results of the t-test sample showed that H0 was rejected, which means that there is a difference in accuracy between CAPM and APT in calculating the return of LQ 45 shares. By using CAPM calculation in predicting stock return, it is expected that investors can allocate their investment funds well to obtain an optimal level of return with a certain level of risk from the stock investment. The results of this study are expected to provide references to investors and potential investors as a source of information in decision-making to make investments in this pandemic period. Investors need to pay attention to fluctuations in market returns because the fluctuation will affect the return of stocks. The investigation results are expected to have implications for investors or practitioners in calculating the expected return of securities and good decision-making to minimize the risks faced by investors and prospective investors, especially in this pandemic period.

Furthermore, for academics, the above research results can be a cornerstone for further researchers related to the comparison of CAPM and APT methods. The limitation of this study is that researchers only use two balance models in predicting investment in this pandemic period and are only limited to LQ 45 companies. Therefore, researchers are expected to add a model that can predict investments to produce accurate information in predicting the investment and choosing larger objects such as manufacturing companies.

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Appendix

Table A1. Average Return of LQ 45 Shares for The Period February 2020–July 2021

No	Issuer Code	R_i	No	Issuer Code	R_i	No	Issuer Code	R_i	No	Issuer Code	R_i
1	ACES	-0.1877	11	BSDE	-0.0074	21	INDF	-0.1902	31	PTPP	0.0186
2	ADRO	0.1757	12	BTPS	-0.3210	22	INKP	0.2924	32	PWON	-0.0372
3	AKRA	0.2274	13	CPIN	0.0081	23	INTP	-0.5342	33	SMGR	-0.2810
4	ANTM	1.6996	14	CTRA	0.3456	24	ITMG	0.7801	34	TBIG	1.2534
5	ASII	-0.1556	15	ERAA	1.0402	25	JPFA	0.2635	35	TKIM	0.2044
6	BBCA	-0.0388	16	EXCL	0.0790	26	JSMR	0.1028	36	TLKM	-0.0898
7	BBNI	-0.1652	17	GGRM	-0.3857	27	KLBF	-0.0812	37	TOWR	0.7087
8	BBRI	-0.0641	18	HMSP	-0.5706	28	MNCN	-0.5127	38	UNTR	0.1074
9	BBTN	0.1761	19	ICBP	-0.2870	29	PGAS	-0.2157	39	UNVR	-0.5714
10	BMRI	-0.1397	20	INCO	0.7370	30	PTBA	0.0804	40	WIKA	-0.2738

Source: Data Processing 2021 (Ms. Excel)

Table A2. IHSG Stock Return February 2020–July 2021

Period	Closing Price IHSG	Return
Jan-20	6,057.596	
Feb-20	5,452.704	-0.09986
Mar-20	4,538.930	-0.16758
Apr-20	4,716.403	0.03910
May-20	4,753.612	0.00789
Jun-20	4,905.392	0.03193
Jul-20	5,149.627	0.04979
Aug-20	5,238.487	0.01726
Sep-20	4,870.039	-0.07033
Oct-20	5,128.225	0.05302
Nov-20	5,612.415	0.09442
Dec-20	5,979.073	0.06533
Jan-21	5,862.352	-0.01952
Feb-21	6,241.796	0.06473
Mar-21	5,985.522	-0.04106
Apr-21	5,995.620	0.00169
May-21	5,947.460	-0.00803
Jun-21	5,985.490	0.00639
Jul-21	6,070.040	0.01413
Average		0.00218

Source : Data Processing 2021 (Ms. Excel)

Table A3. CAPM Beta Value

No	Issuer Code	BETA (β)	No	Issuer Code	BETA (β)	No	Issuer Code	BETA (β)	No	Issuer Code	BETA (β)
1	ACES	0.7208	11	BSDE	1.6492	21	INDF	0.4073	31	PTPP	3.0725
2	ADRO	0.7649	12	BTPS	2.0323	22	INKP	1.6528	32	PWON	1.8418
3	AKRA	1.7359	13	CPIN	0.8277	23	INTP	0.9446	33	SMGR	1.3495
4	ANTM	2.6720	14	CTRA	2.3033	24	ITMG	1.4428	34	TBIG	0.8288

5	ASII	1.2337	15	ERAA	1.6478	25	JPFA	1.4163	35	TKIM	2.5857
6	BBCA	0.8042	16	EXCL	1.3951	26	JSMR	1.6553	36	TLKM	0.9427
7	BBNI	1.9443	17	GGRM	0.8441	27	KLBF	0.3385	37	TOWR	1.1054
8	BBRI	1.4193	18	HMSP	0.9484	28	MNCN	1.8650	38	UNTR	0.5976
9	BBTN	2.7187	19	ICBP	0.1105	29	PGAS	2.6798	39	UNVR	0.1352
10	BMRI	1.3890	20	INCO	1.5884	30	PTBA	0.5763	40	WIKA	2.3467

Source: Data Processing 2021 (Ms. Excel)

Table A4. Average Expected Return CAPM Period February 2020–July 2021

No	Issuer Code	E(Ri) CAPM	No	Issuer Code	E(Ri) CAPM	No	Issuer Code	E(Ri) CAPM	No	Issuer Code	E(Ri) CAPM
1	ACES	0.0127	11	BSDE	-0.0223	21	INDF	0.0245	31	PTPP	-0.0759
2	ADRO	0.0110	12	BTPS	-0.0367	22	INKP	-0.0224	32	PWON	-0.0295
3	AKRA	-0.0256	13	CPIN	0.0087	23	INTP	0.0043	33	SMGR	-0.0110
4	ANTM	-0.0608	14	CTRA	-0.0469	24	ITMG	-0.0145	34	TBIG	0.0086
5	ASII	-0.0066	15	ERAA	-0.0222	25	JPFA	-0.0135	35	TKIM	-0.0576
6	BBCA	0.0096	16	EXCL	-0.0127	26	JSMR	-0.0225	36	TLKM	0.0043
7	BBNI	-0.0334	17	GGRM	0.0081	27	KLBF	0.0271	37	TOWR	-0.0018
8	BBRI	-0.0136	18	HMSP	0.0041	28	MNCN	-0.0304	38	UNTR	0.0173
9	BBTN	-0.0626	19	ICBP	0.0357	29	PGAS	-0.0611	39	UNVR	0.0348
10	BMRI	-0.0125	20	INCO	-0.0200	30	PTBA	0.0182	40	WIKA	-0.0486

Source: Data Processing 2021 (Ms. Excel)

Table A5. Average Expected Return apt period February 2020–July 2021

No	Issuer Code	Expected return APT	No	Issuer Code	Expected return APT	No	Issuer Code	Expected return APT	No	Issuer Code	Expected return APT
1	ACES	0.1771	11	BSDE	0.0453	21	INDF	0.1789	31	PTPP	0.0263
2	ADRO	-0.0886	12	BTPS	0.2745	22	INKP	-0.1739	32	PWON	0.0671
3	AKRA	-0.1264	13	CPIN	0.0339	23	INTP	0.4304	33	SMGR	0.2453
4	ANTM	-1.2025	14	CTRA	-0.2128	24	ITMG	-0.5304	34	TBIG	-0.8763
5	ASII	0.1536	15	ERAA	-0.7204	25	JPFA	-0.1527	35	TKIM	-0.1096
6	BBCA	0.0682	16	EXCL	-0.0179	26	JSMR	-0.0353	36	TLKM	0.1055
7	BBNI	0.1606	17	GGRM	0.3218	27	KLBF	0.0992	37	TOWR	-0.4782
8	BBRI	0.0867	18	HMSP	0.4569	28	MNCN	0.4147	38	UNTR	-0.0386
9	BBTN	-0.0889	19	ICBP	0.2497	29	PGAS	0.1975	39	UNVR	0.4576
10	BMRI	0.1420	20	INCO	-0.4988	30	PTBA	-0.0189	40	WIKA	0.2400

Source: Data Processing 2021 (Ms. Excel)

Table A6. MAD CAPM and MAD APT Period February 2020–July 2021

No	Issuer Code	MAD		No	Issuer Code	MAD	
		CAPM	APT			CAPM	APT
1	ACES	0.0678	0.1223	21	INDF	0.0740	0.1144
2	ADRO	0.0715	0.0835	22	INKP	0.1250	0.1959
3	AKRA	0.0513	0.1291	23	INTP	0.0664	0.2467
4	ANTM	0.1725	0.6605	24	ITMG	0.1192	0.2619
5	ASII	0.0710	0.1324	25	JPFA	0.1038	0.1487

6	BBCA	0.0378	0.0706	26	JSMR	0.0983	0.1083
7	BBNI	0.0702	0.1300	27	KLBF	0.0596	0.0835
8	BBRI	0.0589	0.1010	28	MNCN	0.0547	0.2489
9	BBTN	0.1116	0.1910	29	PGAS	0.0718	0.1834
10	BMRI	0.0642	0.1066	30	PTBA	0.0668	0.0765
11	BSDE	0.0746	0.1138	31	PTPP	0.1158	0.1831
12	BTPS	0.0826	0.1699	32	PWON	0.0755	0.1218
13	CPIN	0.0636	0.0900	33	SMGR	0.0729	0.1586
14	CTRA	0.1021	0.1941	34	TBIG	0.1187	0.4791
15	ERAA	0.1315	0.4126	35	TKIM	0.1355	0.2218
16	EXCL	0.0808	0.1052	36	TLKM	0.0593	0.1056
17	GGRM	0.0826	0.1830	37	TOWR	0.0937	0.2534
18	HMSP	0.0751	0.2507	38	UNTR	0.0784	0.0826
19	ICBP	0.0763	0.1426	39	UNVR	0.0844	0.2525
20	INCO	0.0900	0.2936	40	WIKA	0.1167	0.2024
	Total				3.4268		
	CAPM				7.4114		
	APT						
	E(Ri)				0.0857		
	CAPM				0.1853		
	APT						

Source: Data Processing 2021 (Ms. Excel)

Table A7. Normality Test

One-Sample Kolmogorov-Smirnov Test

		MAD_CAPM	MAD_APT
N		40	40
Normal Parameters[a,b]	Mean	.0857	.1853
	Std. Deviation	.02748	.11692
Most Extreme Differences	Absolute	.169	.167
	Positive	.169	.167
	Negative	-.090	-.163
Kolmogorov-Smirnov Z		1.071	1.055
Asymp. Sig. (2-tailed)		.201	.216

Source : Data Processing 2021 (SPSS 21)

Table A8. Independent Test Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
NILAI_MAD	Equal variances assumed	17.675	.000	-5.246	78	.000	-.09962292	.01899002	-.13742915	-.06181668
	Equal variances not assumed			-5.246	43.297	.000	-.09962292	.01899002	-.13791236	-.06133347

Source: Data Processing 2021 (SPSS 21)