

Analysis of the Use of CAPM in Investing Decisions in the Financial Sector Listed on the IDX for the Period 2020 – 2022

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Abstract

This study aims to analyze the use of the Capital Asset Pricing Model (CAPM) in making investment decisions in the financial sector listed on the Indonesia Stock Exchange (IDX) during the 2020-2022 period. This research method involves collecting historical stock price data and financial data of companies listed in the IDX financial sector during the period under study. This research uses a descriptive research design with a quantitative approach and uses secondary data. Furthermore, statistical analysis will be conducted to test the effect of using CAPM on investment decisions. The results of this study are expected to provide valuable insights for investors and financial market participants. This research can also help in identifying companies in the financial sector that have higher return potential based on CAPM-based analysis.

Keywords: CAPM, Efficient, Inefficient, Investment Decision

INTRODUCTION

In the investment world, investors need to have the ability to identify promising investment opportunities. It is intended that the investment made can generate an optimal rate of return with minimal risk. One way that can help investors in determining investments in the capital market is to use equilibrium models that can determine the level of risk and expected return of an asset. One of the models used is the Capital Asset Pricing Model (CAPM).

CAPM (Capital Asset Pricing Model) is a model used to value or price a capital asset by considering the characteristics and risks of the asset. The main objective of CAPM is to measure the risk of an inefficient portfolio in the capital market, which is denoted as β (beta) (Made, 2020). CAPM aims to assist investors in selecting stocks and reducing investment risk. By using CAPM, investors are expected to understand complex market conditions, reduce investment risk, and estimate the rate of return that can be obtained. The use of CAPM also helps investors in describing complex market conditions. In a fluctuating market, CAPM can provide guidance on how to assess the risk and expected return of an investment.

A wise investor will tend to choose efficient stocks, i.e. stocks that provide a higher rate of return than expected. The concept of efficient stocks can be explained by choosing a certain expected rate of return, then minimizing the associated risk or choosing a certain level of risk, and ultimately maximizing the expected rate of return (Tandelilin & Eduardus, 2010). Inefficient stocks should be avoided as they provide lower than expected individual returns. These stocks are inefficient because they do not provide returns that are proportional to the risk taken.

This study aims to identify the level of risk in investing in stocks using the Capital Asset Pricing Model (CAPM) method, and to determine whether these stocks are included in the category of efficient or inefficient stocks. Based on the description above, the formulation of the problem in this study, namely: Can CAPM be used for investment decision making for stocks in the financial sector in the 2020-2022 period?

Based on the problem formulation stated above, the purpose of this study is to analyze investment decision making in stocks in the financial sector in the 2020-2022 period using the Capital Asset Pricing Model (CAPM) model.

This research is expected to provide benefits to various parties related to this research, such as: (1) For companies classified as unworthy companies to improve their performance in order to attract investors with a low risk profile to invest in the company. Meanwhile, companies that have proven to be viable can use the results of this study as a comparison to maintain their performance, (2) For Investors, it can be a reference and source of information for investors with a low risk profile in making investment decisions in financial sector stocks, (3) For researchers, it is expected to provide new insights for researchers in the field of capital markets and expand knowledge about analytical tools in predicting expected returns on risky assets.

LITERATURE REVIEW

Investment and Portfolio Management

Investment management is the process of building a portfolio consisting of stocks, bonds, and other investment instruments that are considered attractive and marketable. In this case, investment management is a financial service that provides advice on investment strategies to investors and conducts comprehensive investment trading. Although the conventional concept of investment often implies that only people with large capital can invest, investment can actually be done by anyone. Investment is the activity of placing funds in the hope of earning additional money or profits in the future. In other words, investment is the placement of funds today with the aim of gaining profits in the future (Suharti, Edawati, & Zatira, 2023).

Capital Asset Pricing Model (CAPM)

CAPM (Capital Asset Pricing Model) is a model used to value or price a capital asset by considering the characteristics and risks of the asset. The main objective of CAPM is to measure the risk of an inefficient portfolio in the capital market, which is denoted as β (beta) (Made, 2020).

CAPM is at the center of modern financial economics, as it provides accurate predictions of the relationship between risk and expected returns. This relationship serves two important functions. First, it provides a benchmark for evaluating the returns of different investment alternatives. Secondly, the model also helps in making estimates of the expected return of assets that are not yet traded in the market. In addition, the model is also quite accurate for many important applications (Made, 2020).

The CAPM model is used as a tool to predict the equilibrium expected return of a risky asset. The main assumption in this model is that individuals are similar to each other, except in terms of initial wealth and attitude towards risk (Made, 2020).

INDIVIDUAL RETURNS (R_i)

Return is the result obtained from an investment. Returns can be actual returns that have occurred or expected returns that have not occurred but are expected to occur in the future (Jogiyanto, 2013). The actual return formula (R_i) is :

$$R_i = \frac{P_t - (P_t - 1)}{P_t - 1}$$

(Jogiyanto, 2013)

Where:

P_t : current period stock return

$P_t - 1$: previous period stock return

Return Market (R_m)

Market return refers to the level of return obtained from a market index. The selection of a market index is not based on any particular theory, but rather relies on empirical results that have been found (Jogiyanto, 2013). The Return Market formula (R_m) is :

$$R_m = \frac{JCI_t - (JCI_t - 1)}{JCI_t - 1}$$

(Jogiyanto, 2013)

Where :

JCI t : Current period JCI return
JCI t-1 : Previous period JCI return

Risk Free Rate Of Return (Rf)

According to (Aqli, 2015) Risk Free Rate Of Return (Rf) is the rate of return that investors expect as the minimum return on their investment. Risk-free rate of return is the risk-free rate of return given in return for the same delay in consumption, without taking risk into account. Thus, the risk-free rate of return reflects the fundamental fact that by making an investment at this time. The Risk Free Rate Of Return (Rf) formula is

$$Rf = \frac{\sum Bi \text{ Rate periode } t}{12}$$

Systematic Risk or Beta (β_i)

According to (Jogiyanto, 2013) Beta is a measure that indicates the volatility of a security's return or portfolio return relative to the market return. The beta of the i-th security measures the extent to which the volatility of the return of the i-th security is related to the volatility of the market return. In other words, beta is a measure that shows the extent to which a security is exposed to the systematic risk of the market.

The formula for Systematic Risk or Beta (β_i) is :

$$\beta_i = \frac{\sigma_{im}}{\sigma^2_m}$$

(Jogiyanto, 2013)

Where :

β_i : A measure of risk that cannot be diversified away from securities or systematic risk.

σ_m : Covariance between stock i's return and the market return.

σ^2_m : Market variance.

Expected Return

Expected return is the profit anticipated by an investor in the future from the amount of funds that have been invested (Fahmi & Hadi, 2011). Expected return is the profit anticipated by an investor in the future, while actual return is the profit that the investor has earned. It is not surprising that an investor expects a high return from his investment. However, in addition to expecting the desired return, investors also need to pay attention to the risks they have to face (Tandelilin & Eduardus, 2010).

The Expected Return formula is :

$$\sum (R_i) = R_f + \beta_i [\sum (R_m) - R_f]$$

(Jogiyanto, 2013)

Where :

$\sum (R_i)$: Expected rate of return.

R_f : Risk-free rate of return.

$\sum (R_m)$: The expected rate of return on a market portfolio.

β_i : The level of systematic risk of each stock.

Financial Sector

The financial sector plays an important role in driving a country's economic growth. As the locomotive of real sector growth, the financial sector accumulates capital and encourages technological innovation. More specifically, the financial sector can collect savings and channel them through credit to those in need. It provides high-quality, low-risk financial instruments to borrowers. This will increase investment and ultimately accelerate economic growth. On the other hand, information asymmetries in financial markets, characterized by high transaction costs and information costs, can be minimized if the financial sector operates efficiently (Levine, 1997) in (Inggrid, 2006)

The Financial Sector, also known as the financial sector, is a sector that consists of various companies that provide financial services to commercial and retail customers. This includes investment funds, banks and insurance companies. This sector, along with its supporting

institutions, is often referred to as the Financial Services Industry (FSI). The Financial Sector is often considered the "blood" of the economy due to its important role in driving economic activity.

Conceptual Framework

The conceptual framework is a structure of thought that describes the relationship between various variables or concepts involved in the research. This conceptual framework is based on a review of the literature that has been conducted and explains how these concepts are interconnected in the context of the problem being studied (Sampurna & Nindhia, 2018).

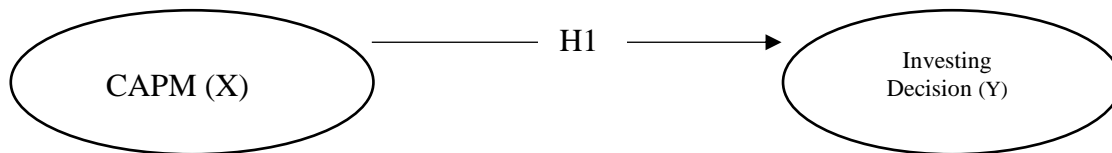


Figure 1. Conceptual Framework

In this study, the hypothesis is based on the assumption that CAPM provides an effective framework for making investment decisions. By using CAPM, investors can estimate the investment decision-making of an investment based on related decisions. In this study, there is a dependent variable (Y) whose value is influenced by the independent variable (X).

Hypothesis development:

H1 : Capital Asset Pricing Model (CAPM) has a positive effect on Investing Decisions

This hypothesis assumes that the use of CAPM will have a positive impact on investment decisions. By using CAPM, investors can estimate the expected return of an investment based on systematic risk (beta) and risk-free rate. Thus, investors are expected to make more informed and rational investment decisions.

METHOD

Research Design

This research uses a descriptive research design with a quantitative approach. According to (Sugiyono, Metodologi Penelitian Kuantitatif, Kualitatif Dan R&D, 2013), Quantitative research methods can be explained as research methods based on the philosophy of positivism. This method is used to investigate certain populations or samples, with sampling techniques that are generally carried out randomly. Data is collected using research instruments, and data analysis is done quantitatively or using statistical methods.

This study aims to determine the considerations in deciding stock investment. This research focuses on knowing how the condition of the company's shares and the results of this study can provide solutions or assessments to investors in assessing risk and making investment decisions.

Data Type

This research uses quantitative data in the form of numbers. Quantitative data that will be taken includes stock closing prices and interest rates.

Data Source

In this study, we will use secondary data sources obtained from other parties. The data includes historical data on the closing price of the company's shares and the Composite Stock Price Index (JCI) during the 2020-2022 period. This data source is obtained through the Yahoo Finance platform. According to (Hasan, 2004), secondary data is information obtained or collected by researchers from existing sources. This secondary data is often obtained from libraries, documents, or available reports.

Research Population and Sample

The population in this study are company shares listed on the Indonesia Stock Exchange during the 2020-2022 period. The sample technique used in this study was purposive sampling technique. There are 5 samples of companies that were previously selected with predetermined criteria. The samples used in this study consisted of five companies, namely BCA Bank, BRI Bank, Mandiri Bank, BTPN Bank, and Maybank Indonesia.

Data Processing

After the data is collected, it will be entered and processed using Microsoft Excel. Data processing is done by arranging it in tabular form so that it can be easily analyzed and conclusions can be drawn. In addition to using Microsoft Excel, the collected data will also be processed using IBM SPSS Statistic 22. Thus, both software will be used to process and analyze the collected data.

Data Analysis Method

To determine whether a stock is efficient or inefficient, data analysis is conducted using the Capital Asset Pricing Model (CAPM) method. By applying the CAPM, a better understanding of whether or not the price of a stock is efficiently reflected in the market can be obtained. This helps investors in making investment decisions.

RESULTS AND DISCUSSION

Sampling in this study was carried out by purposive sampling, this study used the criteria of companies in the financial sector listed on the Indonesia Stock Exchange during the period 2020 - 2022. The companies included in the criteria of this study are Bank BCA (BBCA), Bank BRI (BBRI), Bank Mandiri (BMRI), Bank Tabungan Pensiunan Nasional (BTPN), and Maybank Indonesia (BNII).

Results and Discussion Descriptive Statistics

According to (Winarno, 2017) explains that descriptive statistical analysis is used to describe changes in research on the variables tested. This is done by displaying a histogram, namely the frequency distribution of the data, as well as calculating some basic statistical data such as mean, minimum, maximum, and others.

This research involves the use of various statistical measures to analyze the data. The statistical measures used include mean (average), median (middle value), minimum (lowest value), maximum (highest value), and standard deviation of the measured variables. The variables measured in this study include $E(R_i)$ (the expected rate of return of each stock) calculated using the CAPM method, R_i (the rate of return of each stock), R_f (the rate of return on risk-free assets), R_m (the market rate of return) which uses the JCI as a reference, and Beta (the level of systematic risk of each stock). This research was conducted on financial sector companies during the period 2020 - 2022. The following is a table that explains the statistical data of the study:

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Individual_Return	15	-,364625	,705086	,08842777	,236882863
JCI_Rm	15	5270,35	6974,08	6138,1767	720,33638
Risk_Free	15	42,25	51,00	47,0833	3,75793
Beta	15	,132577	2,605737	1,30314435	,660385275
Expected_Return	15	-67,820506	47,470173	-	30,99153255
Valid N (listwise)	15			13,92077916	1

Source: SPSS output processed by researchers, 2023

The following is an explanation based on data that has been processed using the IBM SPSS Statistics 22 application. This discussion includes the average value (mean), the lowest value (minimum), and the highest value (maximum) of each variable. Based on the information contained in the table, a discussion of the descriptive statistics of each research variable can be described as follows:

1. Average Rate of Stock Return (R_i)

Based on the data processing above, the stock return rate has an average level of 0.08842777, which means that on average, 5 company stocks generated a profit of 0.88%

during the 2020-2022 period. The lowest (min) value of the average rate of stock returns is -0.364625, which occurred in Maybank Indonesia shares in 2022. This means that this stock experienced an average loss of 0.36% during that period. While the highest value (max) of the average rate of stock returns is 0.705806, which occurred in Maybank Indonesia shares in 2020. This means that this company's shares made an average profit of 7.05% during that period. The number of observations on this variable is 5, which means there are 5 average levels of company stock returns.

2. JCI (Rm)

In 2020, the JCI experienced a significant decline as a result of the emergence of the covid-19 virus in China in late 2019 which then spread to Indonesia. This caused investors to massively sell stocks and the market experienced a very deep correction, reaching its lowest point in 5 years. The lowest value of JCI reached Rp 5,270.35. However, in 2022, the JCI recorded a high of IDR 6,974.08. Despite being faced with various complex and challenging scenarios, the President Director of the Indonesia Stock Exchange (IDX) stated that the JCI managed to record a positive performance throughout 2022.

3. Risk Free Rate Of Return (Rf)

Risk Free Rate Of Return has an average of 47.0833 and the lowest value of 42.25 in 2021. Bank Indonesia decided to lower the BI 7-Day Reverse Repo Rate (BI7DRR) to 3.50%, the Deposit Facility rate to 2.75%, and the Lending Facility rate to 4.25% on February 17-18, 2021. This decision was made to maintain low inflation, Rupiah exchange rate stability, and encourage national economic recovery. The highest value (max) is 51.00 in 2020. Bank Indonesia made the decision based on forecasts of low inflation and maintained external stability, as well as efforts to support economic recovery.

4. Beta

During the 2020-2022 period, the average (mean) beta of the 5 company stocks was 1.30314. This shows that the risk owned by these stocks is 1.30314 times the overall market. However, there are BTPN shares in 2022 that have the lowest beta value (min) of 0.1325766. Beta of 0.1325766 means that BTPN shares have a lower risk than the overall market. Meanwhile, the highest (max) beta value of 2.6057369 found in Maybank Indonesia shares in 2021 means that these shares have a higher risk than the overall market. With a beta of 2.6057369, Maybank Indonesia's stock price movements tend to be more sensitive to market changes than other stocks.

5. Expected Return

In the period 2020-2022, the average (mean) value of CAPM is -13.92077916. This indicates the average expected rate of return on an asset or investment portfolio. The lowest value (min) of the expected rate of return is -67.820506 which is found in Maybank Indonesia shares in 2021, this indicates that there are periods where the expected rate of return reaches the lowest value of -67.820506 and there is a significant potential loss on Maybank Indonesia shares in that period. While the highest value (max) of the expected rate of return is 47.470173 found in BTPN shares in 2022, meaning that by using the CAPM method investors expect an average rate of return of 47% on BTPN shares.

Kolmogorof Smirnov Normality Test

The Kolmogorov-Smirnov normality test is one component of the classic assumption test. The purpose of the normality test is to determine whether the residual values follow a normal distribution or not. In a good regression model, it is expected that the residual value has a normal distribution.

The following is the basis for decision making in the normality test:

- If the significance value (p-value) is greater than 0.05, it can be concluded that the residual value is normally distributed.
- If the significance value (p-value) is less than 0.05, it can be concluded that the residual values are not normally distributed.

Then the results of the Kolmogorof Smirnov Normality Test on the results of this study are:

Table 2. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		15
Normal Parameters ^{a,b}	Mean	,0000000
	Std. Deviation	2,83200801
	Absolute	,193
Most Extreme Differences	Positive	,193
	Negative	-,142
Test Statistic		,193
Asymp. Sig. (2-tailed)		,137 ^c

Source: SPSS output processed by researchers,2023

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Based on the results of the normality test, it is known that the significant value is $0.137 > 0.05$, it can be concluded that the residual value is normally distributed.

Multicollinearity Test Tolerance and VIF

According to (Ghozali, 2011) states that there are no symptoms of multicollinearity when the tolerance value is > 0.100 and the VIF value is < 10.00 .

Table 3. Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	-26,694	82,985		-,322	,002		
Return Market	148,318	133,318	,219	1,113	,003	,020	51,258
Risk Free	1,407	1,624	,171	,866	,001	,020	51,102
Beta	-46,205	1,346	-,985	-34,323	,000	,923	1,084

Source: SPSS output processed by researchers,2023

a. Dependent Variable: Expected Return

It is known that the tolerance value of Return Market (Rm) is $0.020 < 0.100$, the tolerance value of Risk Free (Rf) is $0.020 < 0.100$ and the tolerance value of Beta (β) is $0.923 > 0.100$. There are differences in tolerance values between Return Market (Rm), Risk Free (Rf), and Beta (β). For Return Market (Rm) and Risk Free (Rf), the tolerance value is $0.020 < 0.100$. This indicates that the range of acceptable values for Rm and Rf should be between 0.020 and 0.100. If the values of Rm and Rf are within this range, then they meet the tolerance set. However, for Beta (β), the tolerance value is $0.923 > 0.100$. This means that the tolerance of the Beta (β) value should be greater than 0.100. If the Beta (β) value is greater than 0.100, then the value meets the set tolerance. This difference in tolerance indicates that Beta (β) has a greater tolerance compared to Market Return (Rm) and Risk Free (Rf).

The VIF value on Return Market (Rm) is $51.258 > 10.00$, the VIF value of Risk Free (Rf) is $51.102 > 10.00$, and the VIF value on Beta is $1.084 < 10.00$. Based on the Variance Inflation Factor (VIF) value given, there is an indication of a multicollinearity problem between Return Market (Rm) and Risk Free (Rf) in the regression model. The VIF values for Rm and Rf exceed the set limit of 10.00. A high VIF value indicates that the variable is highly correlated with other variables in

the regression model. In this case, Market Return (R_m) and Risk Free (R_f) have a significant relationship and influence each other. However, for Beta (β), the VIF value is 1.084, which is below the 10.00 limit. This indicates that Beta (β) does not suffer from multicollinearity problem in the regression model.

Durbin Watson Autocorrelation Test

According to (Ghozali, 2011) states that there is no indication of autocorrelation if the Durbin-Watson value is in the range between two and (4-du), with du being the desired Durbin-Watson test value.

Table 4. ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	13334,367	3	4444,789	435,439	,000 ^b
Residual	112,284	11	10,208		
Total	13446,651	14			

Source: SPSS output processed by researchers,2023

a. Dependent Variable: Expected Return

b. Predictors: (Constant), Beta, Risk Free, Return Market

Table 5. Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,996 ^a	,992	,989	3,194935923	2,098

Source: SPSS output processed by researchers,2023

a. Predictors: (Constant), Beta, Risk Free, Return Market

b. Dependent Variable: Expected Return

The du value is sought in the distribution of durbin Watson table values based on k (3) and N is (15) seen from the descriptive statistical analysis table with a significance of 5%. du (1.750) < durbin watson (2.098) < 4 - du (2.250). This indicates that there is no significant positive autocorrelation in the regression model. This is because the Durbin Watson value (2.098) is between the du (1.750) and 4 - du (2.250) values. So, there is no indication of significant positive autocorrelation in the regression model with the number of independent variables (k) of 3 and the number of observations (N) of 15.

Stock Classifications and Investment Decisions

There are several factors that determine the grouping of stocks, namely by comparing actual returns (R_i) and expected returns ($E(R_i)$). So, if the actual return (R_i) is greater than the expected return ($E(R_i)$), the stock is categorized as an efficient stock. But if the actual return (R_i) is smaller than the expected return ($E(R_i)$), then the stock is categorized as an inefficient stock. And if the results of the $E(R_i)$ analysis show that the stock is efficient, then the stock should be purchased and used as an investment portfolio. (Sunarya, 2020).

Table 6. Stock Classifications and InvelstmeInt Delcisions

No.	Company	R_i	$E(R_i)$	Stock Efficiency Level	Investment Decision
1.	Bank BCA	0,104633162	-18,6522141	Efficient	Buy
2.	Bank BRI	0,085270213	-74,0147466	Efficient	Buy

3.	Bank Mandiri	0,13389474	- 37,873308	Efficient	Buy
4.	Bank BTPN	-0,027561882	3,511520	Inefficient	Not Buying
5.	Maybank Indonesia	0,037284429	-81,78294	Efficient	Buy

Source: SPSS output processed by researchers,2023

The investment decision for 4 stocks of efficient companies is to buy while there is 1 company stock that is classified as inefficient, the investment decision is not to buy or sell because the possibility of the stock price will decrease.

Partial Hypothesis Test (t test)

According to (Ghozali, 2011) states that if the significance value (sig) <0.05, then it indicates that the independent variable (X) has a partial influence on the dependent variable (Y).

Table 7. Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	-26,694	82,985		-,322	,002		
Return Market	148,318	133,318	,219	1,113	,003	,020	51,258
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Beta	-46,205	1,346	-,985	-34,323	,000	,923	1,084

Source: SPSS output processed by researchers,2023

a. Dependent Variable: Expected Return

Conclusions :

- Stock Return / R_i (X_1) affects Beta (Risk)
- Market Return / R_m (X_2) affects Beta (Risk)
- Risk Free / R_f (X_3) affects Beta (Risk)

Based on this conclusion, it can be concluded that the variables of Stock Return (R_i), Market Return (R_m), and Risk Free (R_f) affect Beta (Risk). This means that changes in Stock Return, Market Return, and Risk Free can affect the level of risk (Beta).

CONCLUSIONS AND SUGGESTIONS

Based on research that has been conducted related to the Analysis of the Use of CAPM in Investing Decisions in the Financial Sector Listed on the IDX for the Period 2020 - 2022 with a total sample of 5 company shares, the results that have been studied based on data processing with the CAPM method with the help of Excel and SPSS applications are that there are 4 company shares with a positive average rate of return (R_i) and 1 company share with a negative average rate of return. There are 4 company stocks classified as efficient stocks, namely Bank BCA, Bank BRI, Bank Mandiri, and Maybank Indonesia while there is 1 company stock classified as inefficient stocks, namely BTPN Bank. The decision taken on efficient stock shares is to buy, while the decision for inefficient stocks is not to buy/sell. The advice that can be given in this study for investors is to choose stocks whose average stock return (R_i) is higher than the average level of expected stock returns ($E[R_i]$).

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