
Decentralized Finance (DeFi): Price Liquidity, Market Efficiency on Prices

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Abstract

Decentralized Finance (DeFi) is a blockchain-based financial system that utilizes smart contracts to increase efficiency and transparency, while overcoming the limitations of conventional financial systems. In Indonesia, there is still little research on blockchain, especially on the DeFi, so investors have very little information. The lack of previous research on the DeFi in Indonesia creates a knowledge gap, given that the local DeFi market has unique characteristics influenced by investor preferences, evolving regulations, and specific levels of technology adoption. Cryptocurrency prices, including the DeFi, are influenced by public information that reflects market efficiency. For example, on October 10, 2020, the price of Yearn Finance (YFI) increased 36% following the rise in Bitcoin prices, demonstrating the link between information, transaction volume, and fluctuations in the DeFi market value. This research aims to identify the factors that influence the DeFi price changes, focusing on the influence of price liquidity and market efficiency. Using a quantitative approach, 65 DeFi coins were selected through purposive sampling, and analysis was carried out using multiple regression using EViews 13. The research results show that partially, price liquidity and market efficiency do not have a significant effect on the DeFi price changes. However, simultaneously, these two variables have a significant effect, with a contribution to price changes of 54.521%. The insignificance of the influence of market efficiency on the DeFi prices suggests that regulations focused on improving efficiency may not be enough to control price volatility or promote price stability in the DeFi ecosystem.

Keywords: Blockchain, Cryptocurrencies, Decentralized Finance, Market Efficiency, Price Liquidity

Introduction

Decentralized Finance (DeFi) is an innovative financial system. It uses blockchain technology and smart contracts to improve financial efficiency and transparency. DeFi also seeks to solve problems that are often found in conventional financial systems (Schär, 2021). Despite being a new technological innovation, DeFi currently still holds considerable drawbacks and risks. Therefore, DeFi has all the hallmarks of blockchain and cryptocurrency, which are decentralized and transparent, without any intermediary or government influence on this entire ecosystem. Clarity constitutes a significant advantage, as all transactions are transparently documented within the blockchain system. (Gogel, 2021).

In general, DeFi uses public blockchains such as Ethereum to support smart contracts. Smart contracts are automated agreements in the form of code that operate automatically under certain conditions and cannot be changed after use (Z. Chen et al., 2021). This increases efficiency and reduces reliance on third parties, especially in the supervision of agreement performance. Smart contract automation can also increase trust and reduce potential costs, such as operational costs,

fraud, and legal risks. Stablecoins, as an important aspect in DeFi, are replacing cryptocurrencies whose values are too volatile. Stablecoins are assets whose value is tied to an external reference, such as gold or the US Dollar, using complex algorithms or legal references. The development of Central Bank Digital Currency (CBDC), a digital form of central bank money, can also be an additional source of stable value for DeFi (Warren et al., 2021). Blockchain-based DeFi can connect with the outside world through oracles, which are data sources that provide information such as stock values, currency values, or weather data. This function is essential for DeFi to create utility outside of its ecosystem. All applications and organizations in the DeFi ecosystem are decentralized, can be used by anyone without a controlling entity. The organization is governed by operational rules in smart contracts and governed by governance token holders (Deshmukh et al., 2021). DeFi services offer several advantages, including reduced transaction fees, expanded financial inclusion, and increased access to basic financial services. Furthermore, DeFi encourages permissionless innovation and fosters new opportunities for entrepreneurs, customers, and innovators. Ultimately, these services have the potential to reshape the modern financial structure and create a new landscape for entrepreneurship. (Y. Chen & Bellavitis, 2019). While DeFi seeks to empower individuals through disintermediation and decentralization, drawing from crypto-anarchist ideals, it is not without considerable drawbacks. Key challenges involve market manipulation and distorted incentives. Additionally, the platform faces risks related to excessive speculation, Ponzi schemes, and money laundering (Chohan, 2021). DeFi has the potential to drive significant improvements like efficiency, transparency, innovation, and financial inclusion. However, it also raises serious concerns. These include the risks of potential fraud, cyberattacks, and complex issues related to decentralized financial governance (Gogel, 2021). Decentralized finance offers potential benefits for accounting and financial practices. However, crypto assets also introduce accounting challenges, notably a lack of consistency in their treatment, accounting, and reporting (Smith, 2021).

The innovations created need to be improved by reducing the risks inherent in them because the digital currency market is often filled with speculative activities. Although the cryptocurrency market is often highly volatile and trading digital currencies carries significant risks, the growth of this market is rapid and provides significant profits for investors and miners of digital currencies. The extraordinary level of profit, especially in 2017, bitcoin also broke through IDR 15.27 million in early January 2017 and then doubled to IDR 61 million in August 2017 (Puspadini, 2023), highlighting the importance of market efficiency in this research. Market efficiency, especially when virtual currencies are used as speculative investments, can hinder the allocation of national resources for more productive use, as perceived by investors. Prices in an efficient market fully reflect all available information. Market efficiency itself is classified into three forms: weak, semi-strong, and strong, differentiated by the degree to which information is incorporated into prices (Fama, 1970). The price of cryptocurrencies such as Bitcoin reacts to publicly announced information and follows the concept of an efficient market (BARTOS, 2015). Arbitrage opportunities, however, continue to appear frequently. For instance, the collapse of FTX, which was the third-largest cryptocurrency exchange, in November 2022, further eroded investor trust in the cryptocurrency market. Arbitrage opportunities arise when there is a price difference between assets in a competitive market, which indicates that the market is inefficient because it does not meet the market efficiency requirements, i.e. the absence of arbitrage opportunities (Berk & DeMarzo, 2011). Rising crypto prices can rival stock prices. Trading volumes on crypto exchanges are often higher than on many of the world's largest stock exchanges. Liquidity in crypto refers to the ease of exchanging crypto assets into fiat currencies quickly, without significantly affecting the price of the asset. Generally, crypto assets that have high liquidity are often popular or widely used in various industries, both in terms of function

and usability. In addition, the concept of liquidity is also closely related to the order book or limit order list. It is a mechanism used by buyers and sellers to transact and create an optimal level of liquidity for crypto assets in the market. In reality, liquidity varies over time, although the amount varies from asset to asset. Thus, investors are not only exposed to the risk of liquidity levels, but also variations in liquidity levels.

In the DeFi market, when information is announced to the public, it can change in value. For example, on October 10, 2020, according to cointelegraph, the DeFi price of Yearn Finance (YFI) increased by 36% along with the increase in the price of Bitcoin. The available information can affect the market value of DeFi. Once the information is disseminated, the market will respond with increased transaction volumes, which can result in fluctuations in the value of the DeFi market. In the event of an increase in the number of transactions, liquidity will increase and the market will become more efficient.

In Indonesia, there is still little research on blockchain, especially in the DeFi, so investors are very few in getting information. The lack of previous research on the DeFi in Indonesia creates a knowledge gap, given that the local DeFi market has unique characteristics influenced by investor preferences, evolving regulations, and specific levels of technology adoption. Based on the above background, it is necessary to research Decentralized Finance (DeFi): Price Liquidity, Market Efficiency to Price.

Research Methods

Method

The research method used for this test is the Correlational Quantitative testing technique. Correlational testing is used to investigate the degree of variation in variables related to variation in at least one different factor, which is observed through correlation coefficients (Azwar, 2010). Through this study, data on the level of relationships that occur can be obtained, regardless of the influence between these variables.

Research Object

The object of this research is price liquidity, market efficiency and price. Meanwhile, the subject of his research is Decentralized Finance (DeFi) Blockchain.

Types and Data

Sources The data used in this study is secondary data, namely data sources obtained indirectly through intermediary media obtained and recorded from other parties (Sugiyono, 2016). In this study, the author obtained data in the form of DeFi daily digital currency prices sourced from several cryptocurrency data provider websites.

Population

The population in this study is Decentralized Finance (DeFi) Blockchain, which is as many as 707 coins registered.

Sample

The sampling technique used in this study is the purposive sampling technique, which is by considering certain criteria according to the author's wishes. The following are the sample criteria that will be used in this study:

1. Decentralized Finance/ DeFi traded from 2020 – 2023
2. Decentralized Finance/DeFi that is actively transacted on exchanges and has complete trading information

So the sample in this study is as many as 65 cryptocurrency coins that are included in Decentralized Finance (DeFi).

Analysis Tools

Data processing uses EVIEWS 13 to assist in analyzing data.

Table 1. Variable Operationalization

Variable	Operational Definition	Indicators	Scale
Price Liquidity	Liquidity is a description of an asset that can be traded on the exchange without affecting its value (for example, cash is considered the most liquid asset).	$LIQ_t^i = \frac{1}{Dt} \sum_{t=1}^{Dr} \frac{[R_t^i]}{P_t^i V_t^i}$ By :D t : Number of days of cryptocurrency trading i during the year t R_tⁱ : Return of cryptocurrency i on day t V_tⁱ : Cryptocurrency trading volume i P_tⁱ : Daily price of cryptocurrency i on day t	Ratio
Market Efficiency	Market efficiency in a weak form means that the previous value cannot reflect the future value, or it can be interpreted that the previous value is not related to the formation of future value.	$R_t = \ln(P_t) - \ln(P_{t-1})$ With: R_t : Return ln(P_t) : Current price ln(P_(t-1)) : Previous price	Ratio
Decentralized Finance/ DeFi Blockchain Pricing	Blockchain Decentralized Finance (DeFi) trading is carried out in various markets in one country. The Decentralized Finance (DeFi) market can be measured by the market capitalization of each type of DeFi.	Market Cap = Amount of DeFi in circulation x market price	Ratio

Research Paradigm

The model in this study uses the relationship between variables where there are three research variables, namely Price Liquidity, Market Efficiency and Blockchain Decentralized Finance (DeFi) Price which are described in the research model as follows:

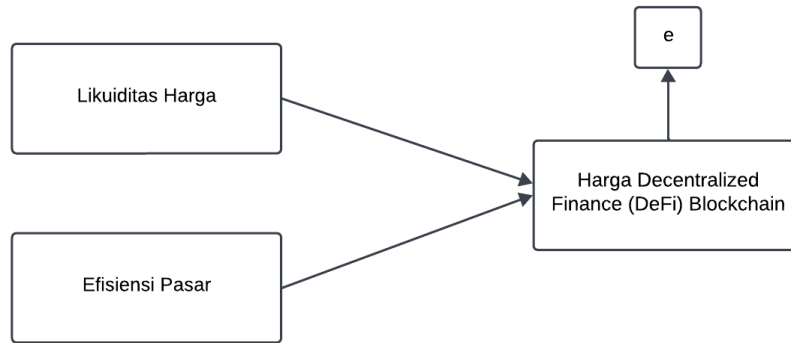


Figure 1. Research Paradigm
Source: data processed, 2024.

Data Testing

The form of data used is panel data, namely combining continuous data (time series data) with cross-section data. The panel data analysis method uses the panel data regression analysis method. An appropriate panel data regression model is needed, including the Common Effect Model, Fixed Effect Model or Random Effect Model, then the stages of testing the estimation method of the Chow Test, Langrange Multiplier or Hausman Test are carried out according to the probability results of each model. From the secondary data that can be processed using statistical software assistance application programs including Microsoft Excel 365 for variable calculations. Data processing uses EVIEWS version 13 to assist in analyzing the data used in conducting descriptive statistical tests and the significance of multiple regression analysis of panel data.

Method of Determining the Estimation Model

The data panel is a mixture of time-series information and cross-section data. Panel data regression is a regression method that combines time-series information and cross-section information which will obviously have more perception than time-series information and cross-section information alone. (Gujarati & Porter, 2013)

Panel Data Model Estimation

The regression model can be estimated using table data, there are three approaches, namely: (Hamid et al., 2020)

Common Effect Model

When applying regression to cross-sectional or time series data, the *Ordinary Least Squares* (OLS) method is also the same. However, regression analysis should first be performed after combining cross-sectional data and time series data for panel data. The OLS approach, sometimes referred to as general effect estimation, is then used to estimate the model by treating this combined data as a single unit of observation. But when we collect data, we can no longer distinguish between different people or time periods. In other words, this strategy believes that behavioral data between organizations will remain the same at all times, ignoring individual and temporal variables.

Fixed Effect Model

In this model, it is assumed that all units have a different midpoint, while the coefficients remain constant. When estimating panel data, this design uses *dummy* variables to account for intercept differences.

Random Effect Model

With this approach, the intercept is random but varies for each variable. The difference in intercepts in the random effects model is calibrated to each person's error state. One of the benefits of this paradigm is the loss of heteroscedasticity. Relatives are also used in this strategy to analyze relationships between variables and between times.

Techniques for Determining Regression Models

To find out the best panel data regression model among the models obtained, it is necessary to test the estimation model. Several tests can be performed to select the most suitable model, including: (Hamid et al., 2020)

Chow Test

The optimal design between fixed effect and general effect is determined by the Chow test. The following hypothesis forms the basis of this test:

H0: Model *common effect*

Ha: Model *fixed effect*

The test criteria are as follows:

1. If the *P-value* > 0.05, then receive H0
2. If the *P-value* < 0.05, then reject H0

The Hausman Test and Lagrange Multiplier (LM) test are not required if

Common Effect proved to be a more effective regression model, signaling that the testing procedure had been completed.

Hausman Test

In the panel data estimation, the Hausman test is used to determine whether a fixed effect design or random effect is optimal. It is necessary to assume that there are more cross-class variables than independent variables in the model with the corresponding constants when performing the Hausman test. This test was carried out using various hypotheses:

H0: Model *random effect*

Ha: Model *fixed effect*

The test criteria are as follows:

1. If the *P-value* > 0.05, then receive H0
2. If the *P-value* < 0.05, then reject H0

To identify the optimal model between *the common effect* and *the random effect*, it is necessary to carry out *the Langrange Multiplier (LM)* test, based on the findings of two fundamental model selection tests. The *Langrange Multiplier (LM)* test is unnecessary if the Chow test shows that the best model is a fixed effect and the Hausman test shows that the best model is a fixed effect. This is because the *random effect* model is considered superior to *fixed effect* or *common effect*.

Lagrange Multiplier (LM) Test

To determine which design is optimal between general effects and random effects, the LM Test is used. Verify that the generic effect model is what is presented in the window. To assess the performance of the model between general effects and random effects, the LM test was used. This test was carried out using various hypotheses:

H0: *common effect model*

Ha: *random effect model*

The test criteria are as follows:

1. If the *P-value* > 0.05, then receive H0
2. If the *P-value* < 0.05, then reject H0

Multiple Regression Analysis

Multiple linear regression is a linear relationship between two or more independent variables ($x_1, x_2, \dots, x_n$) with a dependent variable (y). This analysis is used to find out the direction of the relationship between independent variables and dependent variables whether each independent variable is positively or negatively related and to predict the value of the dependent variable if the value of the dependent variable increases or decreases

Due Diligence

Test F (Model Feasibility Test)

The formulation of the hypothesis is as follows:

1. H0: $\beta_i = 0$ This indicates that Price Liquidity and Market Efficiency are not affected by DeFi prices;
2. H0: $\beta_i \neq 0$ This indicates that Price Liquidity and Market Efficiency are affected by DeFi prices.

Test t (Partial testing)

The purpose of this test is to determine whether each independent variable has a significant effect on the dependent variable. The criteria for testing the hypothesis are seen by the probability value:

1. If the P-value < 0.05 , then H_0 will be rejected.
2. If the P-value > 0.05 , then H_0 is not rejected.

Coefficient of Determination

To listen to the model used, you can see the determination coefficient ($R^2_{Adjusted}$), which shows how much the independent variables in the model can explain the variation of the dependent variables.

The following formula can be used to obtain the determination coefficient:

$$Kd = R^2 \times 100\%$$

Remarks:

Kd = Coefficient of Determination

R^2 = Correlation coefficient

$0 < R^2 < 1$ is the adjusted R^2 value range.

The stronger the relationship between the two variables, the higher the Adjusted R^2 , the stronger the correlation between the variable and the dependent variable. Some might argue that the model is good. Meanwhile, there is no relationship between independent and dependent variables if the Adjusted R^2 value is in the range of 0. Conversely, if it is close to 1 then the independent variable provides most of the information needed to estimate the dependent variable.

Results And Discussion

Research Results

This chapter contains the results of research activities that have been carried out. The analysis described consists of descriptive analysis to explain the object of the research. After that, the analysis continued with a discussion of the results of data testing using *E-views 13*.

Description of Research Data

This study aims to determine the influence of independent variables on dependent variables used in the period from 2020 to 2023. The data used by the researcher to conduct tests and processing were obtained from secondary data, using purposive sampling techniques in selecting samples by setting several criteria. Based on the sample criteria that have been set by the researcher, 65 coins were obtained during the 2020-2023 period. The following are the details of the sampling process in this study shown through the following table:

Table 2. Sampling Criteria

No	Criterion	Total
1	Decentralized Finance/ DeFi traded from 2020 – 2023	707
2	Decentralized Finance/DeFi that is actively transacted on exchanges and has complete trading information	65
Number of companies used		65
Year of Observation		4

Source: data processed, 2024.

Based on Table 2, it is shown that the total is 707 coins. Based on the number of population, a sampling process was then carried out using 2 (two) criteria that became a deduction, so that the number of population used as the object of research was 65 with the number of periods used for observation for 4 years, namely in 2020-2024. In the sample data used by the researcher, the following is sample data:

Table 3. Sample

No	Coin Code	No	Coin Code	No	Coin Code	No	Coin Code
1	LINK	23	CHR	34	FUN	56	SHARD
2	DAI	24	BAND	35	MLN	57	MMO
3	STX	25	SXP	36	SUSD	58	NIOX
4	MKR	26	RLC	37	WAN	59	MET
5	THETA	27	NMR	38	IDEX	60	RCN
6	FTM	28	TRB	39	COVAL	61	AUC
7	RUNE	29	TLOS	40	AKRO	62	TKN
8	CKB	30	REQ	41	AMB	63	KNCL
9	XTZ	31	STPT	42	AST	64	HOT
10	SNX	32	BNT	43	TIME	65	MFG
11	GNO	33	REN	44	SWFTC		
12	KAVA	23	CHR	45	FSN		
13	TFUEL	24	BAND	46	FSN		
14	LUNC	25	SXP	47	SWTH		
15	OCEAN	26	RLC	48	BTS		
16	ANKR	27	NMR	49	OXEN		
17	RPL	28	TRB	50	REP		
18	ZRX	29	TLOS	51	ERC		
19	BAT	30	REQ	52	NEX		
20	LRC	31	STPT	53	Social		
21	WBTC	32	BNT	54	PLR		
22	RSR	33	REN	55	ZAP		

Source: data processed, 2024.

Descriptive Statistical Analysis

Descriptive statistical analysis is an analysis that is carried out with the aim of providing a description or picture in the form of relevant information related to a sample or data in research, which includes the lowest value (minimum), highest value (maximum), mean value (mean), and

standard deviation value. The following are the results of descriptive statistical analysis obtained through Eviews 13 software: analysis to provide visualization or description of data can be seen from the mean value, standard deviation, maximum and minimum is called descriptive statistical analysis.

Table 4. Descriptive Statistics

	Y	X1	X2
Mean	8.31E+15	-24.85506	4.60E+13
Median	4.50E+15	0.000000	0.000000
Maximum	8.58E+16	1.752972	6.60E+16
Minimum	0.000000	-13995.04	-5.91E+16
Std. Dev.	1.21E+16	583.2283	6.71E+15
Skewness	2.405226	-23.92223	0.658497
Curtosis	10.66585	573.5101	41.46026
Jarque-Bera	1965.738	7866501.	35542.23
Probability	0.000000	0.000000	0.000000
Sum	4.79E+18	-14316.51	2.65E+16
Sum Sq. Dev.	8.36E+34	1.96E+08	2.59E+34
Observations	576	576	576

Source: data processed by Eviews 13, 2024.

Based on Table 4, information related to the research data of each variable to be studied is shown. The following is the interpretation of the results of the descriptive analysis that has been carried out as follows:

- In the *Price* variable (Y), it is shown that the lowest value (minimum) of this variable is 0.000000, the highest value (maximum) is 8.58E+16, the mean value is 18.31E+15, and the standard deviation value is 1.21E+16.
- In the *Price Liquidity* variable (X1), it is shown that the lowest value (minimum) of this variable is -13995.04, the highest value (maximum) is 1.752972, the mean value is -24.85506, and the standard deviation value is 583.2283.
- In the *Market Efficiency* variable (X2), it is shown that the lowest value (minimum) of this variable is -5.91E+16, the highest value (maximum) is 6.60E+16, the average value (mean) is 4.60E+13, and the standard deviation value is 6.71E+15.

Regression Model Selection

In this study, the panel data regression model estimate has three approach models to be selected, therefore a process is needed to select a regression model to determine which model will be used from the three existing models, namely the *Common Effect Model* (CEM), the *Fixed Effect Model* (FEM), and the *Random Effect Model* (REM) through the chow test and the hausman test as follows:

Chow Test

In this study, a chow test was carried out to compare the best model to be selected between *the Common Effect Model* (CEM) and *the Fixed Effect Model* (FEM). The following is a table of comparison results between the two models and the results of the chow test:

Table 5. Chow Test

Redundant Fixed Effects Tests			
Equation: Untitled			
Test cross-section fixed effects			
Effects Test	Statistics	D.F.	Prob.
Cross-section F	4.034428	(11,562)	0.0000
Cross-section Chi-square	43.777653	11	0.0000

Source: data processed by Eviews 13, 2024.

Thus, the model that will be used after the chow test is carried out is the *Fixed Effect Model* (FEM) because the probability value obtained is below < 0.05 .

Hausman Test

In this study, a hausman test was carried out to compare the best model to be selected between *the Fixed Effect Model* (FEM) and *the Random Effect Model* (REM). The following is a table of comparison results between the two models and the results of the hausman test:

Table 6. Hausman Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistics	Chi-Sq. D.F.	Prob.
Cross-section random	12.784086	2	0.0017

Source: data processed by Eviews 13, 2024.

Thus, the model that will be used after the hausman test is the *Fixed Effect Model* (FEM) because the probability value obtained is below < 0.05 . Thus, in making decisions for model selection, it is enough to carry out two tests, namely the chow test and the hausman test with Eviews 13 software, the hausman test has the same test results as the results of the chow test, namely the Fixed Effect Model (FEM) which was selected as a regression model. Thus, there is no need to retest because the Fixed Effect Model (FEM) has been selected.

Classical Assumption Test

The classical assumption test is a series of tests that are carried out to ensure the consistency of the regression equation so that it does not cause bias and the results of regression analysis are reliable.

Multicollinearity Test

In the multicollinearity test, the basis of the decision is 0.80 as a criterion for the multicollinearity test, where if the correlation value between the resulting variables is greater than 0.80, the data can be said to indicate having symptoms of multicollinearity. On the other hand, if the correlation value between the variables produced is less than 0.80, the data can be said to have no indication of multicollinearity symptoms. The following are the results of the multicollinearity test on *Eviews13*:

Table 7. Multicollinearity Test

	X1	X2
X1	1	0.001194008331617371
X2	0.001194008331617371	1

Source: data processed by Eviews 13, 2024.

Based on the results of the multicollinearity test in table 9, it can be known that the value of the coefficient of association between variables is less than 0.8. Based on the test results, it can be interpreted that there are no symptoms of multicollinearity, so the data is feasible to use.

Heterokedasticity Test

In the heteroscedasticity test, the researcher uses the glacier model on the basis of the decision, namely if the result of the resulting probability value is >0.05 , then it can be said that the research data does not have any indication of heteroscedasticity. Likewise, if the result of the resulting probability value is <0.05 , it can be said that the data is an indication of heteroscedasticity. The following are the results of heteroscedasticity testing conducted using the glacier model in Eviews 13:

Table 8. Heterokedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.46E+15	3.58E+14	23.63433	0.0000
X1	5.92E+11	6.14E+11	0.964393	0.3353
X2	-0.052658	0.053312	-0.987745	0.3237

Source: data processed by Eviews 13, 2024.

Based on the results of the heteroscedasticity test, it can be found that:

1. The probability obtained by the Price Liquidity variable is 0.3353 (>0.05)
2. The probability obtained by the Market Efficiency variable is 0.3237 (>0.05)

Based on these results, it can be interpreted that the data of this study has no indication of the occurrence of heteroscedasticity problems, so the research data is suitable for use.

Hypothesis Test

In conducting hypothesis testing, researchers will use 4 (four) types of hypothesis testing, namely multiple linear regression analysis, determination coefficient test (R^2), simultaneous signification test (Test F), and individual parameter signification test (Test t).

Multiple Linear Regression Analysis

The use of multiple linear regression analysis in this study was carried out with the aim of providing an overview of the characteristics of independent variable data that affects *DeFi prices*. The following are the results of multiple linear regression analysis:

$$Y = 8.31406390289e+15 + 847864540.539 * X1 - 0.0818304275374 * X2$$

Based on the regression equation model that has been mentioned, it can be interpreted as follows:

1. The value of the constant (C) is **8.31406390289e+15** (positive value), which shows that the influence between the independent variable and the dependent variable runs in one direction. So the results show that if the independent variables, namely the price liquidity variable as X1 and market efficiency as X2, do not exist or have a value of 0, then *the DeFi price* has a consideration value of **8.31406390289e+15**.
2. The Coefficient *value* of the price liquidity variable as X1 is **847864540.539** (positive value) which shows the influence that runs in the direction between the price liquidity variable and *the DeFi price*. The results show that if the price liquidity variable increases by 1 point, the *DeFi price* variable increases by **847864540.539**. This is based on the assumption that other variables are considered to have a constant value.
3. The Coefficient *value* of the price liquidity variable as X1 is **0.0818304275374** (negative value) which shows the influence that runs in a non-directional manner between the market efficiency variable and *the DeFi price*. The results show that if the market efficiency variable increases by 1 point, the *DeFi price* variable decreases by **0.0818304275374**. This is based on the assumption that other variables are considered to have a constant value.

Test F (Model Feasibility Test)

The feasibility test of the model or the F test is used to determine whether the regression model is suitable for use in this study or not. In the F test, it is seen from the significance value with *a significance level* of (0.05/5%). If the significance value < 0.05, the regression model passes the model feasibility test.

Table 9. Model Test (TEST F)

R-squared	0.075897	Mean dependent var	8.31E+15
Adjusted R-squared	0.545210	S.D. dependent var	1.21E+16
S.E. of regression	1.17E+16	Akaike info criterion	76.86320
Sum squared resid	7.73E+34	Schwarz criterion	76.96908
Log likelihood	-22122.60	Hannan-Quinn criter.	76.90449
F-statistic	3.550578	Durbin-Watson stat	1.928137
Prob(F-statistic)	0.000023		

Source: data processed by Eviews 13, 2024.

Based on the results of the F-test, it can be seen that the *Prob* value (*F-Statistic*) is $0.0000023 < 0.05$, then H_0 is rejected. This means that the regression model in this study has been feasible to use to test hypotheses or in other words, this study is feasible/significant.

Test t (Partial Testing)

The t-test is used to show whether each independent variable individually has an influence on DeFi prices.

Tabel 10. Test t

Dependent Variable: Y				
Periods included: 48				
Cross-sections included: 12				
Total panel (balanced) observations: 576				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.31E+15	4.89E+14	16.99924	0.0000
X1	8.48E+08	8.47E+11	0.001001	0.9992
X2	-0.081830	0.072860	-1.123124	0.2619

Source: data processed by Eviews 13, 2024.

- Based on the table above, the decision taken as a result of the test can be known as follows:
- The probability value of Price Liquidity is $0.9992 > 0.05$ then H_0 is not rejected. This means that Price Liquidity has a positive effect on DeFi Prices that are not significant.
 - The probability value of Market Efficiency is $0.2619 > 0.05$ then H_0 is not rejected. This means that Market Efficiency has a negative effect on DeFi prices.

Coefficient of Determination (Adjusted R²)

The determination coefficient (*Adjusted R²*) in the regression of the panel data is used to determine the percentage of influence of independent variables together on dependent variables. This determination coefficient serves to find out how much independent variables can explain the variables in the model used. The results of the determination test in this study are as follows:

Table 11. Coefficient of Determination Test

Adjusted R-squared	0.545210
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Source: data processed by Eviews 13, 2024.

Based on the results of the determination coefficient (*R²*) test, it shows that the value (*R²*) is 0.545210 or 54.521%. This means that overall the variables of price liquidity and market efficiency can explain the change in the data in the DeFi Price variable and the remaining 45.47% can be explained by other variables that were not analyzed in the study.

Hypothesis Test

In conducting hypothesis testing, researchers will use 4 (four) types of hypothesis testing, namely multiple linear regression analysis, determination coefficient test (R^2), simultaneous signification test (Test F), and individual parameter signification test (Test t).

Discussion

In the discussion, the results obtained through data analysis using *Eviews 13* will be discussed. This discussion section answers the research questions that have been formulated on problem identification.

The Effect of Price Liquidity on the Price Change of Decentralized Finance (DeFi).

The results of data processing show that Price Liquidity has a positive but not significant effect on DeFi Prices. This lack of significance may be attributed to the inherent high volatility and dynamic evolution of the DeFi market (Harvey et al., 2021). Price instability and reliance on technical parameters can lead to inconsistent liquidity influences. Several previous studies have shown mixed results regarding the influence of price liquidity on DeFi prices. Research by Smith and Jones (2021) found that price liquidity in the crypto market tends to be positively related to price, but this influence is influenced by the volatility and adoption rate of certain assets (Smith, 2021). On the other hand, Garcia et al. (2022) point out that liquidity often does not have a significant direct influence on crypto prices, but rather acts as a mediator influenced by other factors such as trading volume and market sentiment (Garcia et al., 2022). Brauneis and Mestel (2018) found that price liquidity correlates positively with price efficiency and negatively with volatility (Brauneis & Mestel, 2018). However, there are also studies that show that the influence of liquidity on prices can be insignificant when market volatility is high or under certain market conditions, as happened during the COVID-19 pandemic, where low liquidity actually increases market inefficiency.

Price liquidity is an important factor in traditional financial markets, but the DeFi market has different dynamics. Factors such as investor sentiment, protocol mechanisms, technology adoption, and regulation can have a more significant impact on prices compared to liquidity alone. Volatility in more traditional financial markets can be affected by external factors such as monetary and macroeconomic policies, while in DeFi, volatility is often related to technical parameters in smart contracts and the adoption of new technologies. Investors when they are going to invest cannot rely only on liquidity to predict the price of DeFi. They need to consider other factors such as market volatility, capital flows, and protocol innovation, and need to adopt strategies that are more dynamic and responsive to broader market conditions rather than simply focusing on liquidity. It is important to consider a more holistic analysis including broader technical and regulatory risks that can affect DeFi prices. For investors, liquidity should not be the only reference in making investment decisions in the DeFi market. While liquidity is important, investors need to consider other factors such as market sentiment, global volatility, and technological developments. This can lead to the use of more adaptive trading strategies, such as asset diversification or the use of algorithms that consider many variables at once. Liquidity providers need to acknowledge that their contribution to liquidity may not always affect the price as expected. Therefore, a more comprehensive risk management strategy,

including risk assessments involving external market conditions, may be necessary to protect their capital from unexpected volatility.

The Influence of Market Efficiency on the Price Change of Decentralized Finance (DeFi).

The results of the data processing show that Market Efficiency has a negative and insignificant effect on DeFi Prices. Research by Liu et al. (2020) found that in the crypto market, increased efficiency is often followed by a decrease in price volatility. This decrease in volatility can cause DeFi asset prices to tend to decline along with the decrease in risk associated with high volatility (W. Liu et al., 2020). These results are consistent with the research of Zhang and Li (2021), which showed that in a more efficient crypto market, asset prices tend to be more stable and could even decline in the short term due to reduced over-speculation (Zhang & Posso, 2019). This can be compared to the findings of research by Urquhart (2016), which also found that although the crypto market shows signs of efficiency, the relationship between efficiency and price movements is often insignificant. Factors such as liquidity and market sentiment may be more dominant in influencing the price of crypto assets than the efficiency of the market itself (Urquhart, 2016). The insignificance of these results may indicate that while there is a negative trend between Market Efficiency and DeFi Pricing, this relationship is not statistically strong enough to be considered significant. In the context of DeFi, this insignificance can be caused by high volatility and market dynamics that are still evolving. In a young and growing market, such as the DeFi market, market efficiency may not have reached an adequate level to significantly affect asset prices (Feng et al., 2017).

The negative coefficient suggests an inverse relationship: as Market Efficiency rises, DeFi Prices tend to fall. Conceptually, this can be interpreted as the market becomes more efficient, the price of DeFi tends to decrease. This can happen because in an efficient market, the available information is reflected more quickly in the price, so the potential speculative profit from DeFi prices decreases. In efficient market theory, the price of an asset should reflect all available information. Therefore, with increasing efficiency, DeFi prices may be more stable or even decrease due to reduced volatility caused by information asymmetry or market imperfections. However, price declines can also result from other factors such as decreased demand or more realistic expectations of potential profits. Insignificance can also be interpreted as the fact that despite indications of a negative relationship, the impact of Market Efficiency on DeFi Pricing may not be large enough or consistent to be taken into account in decision-making or investment strategy. This can encourage researchers to explore other factors that are more significant in influencing DeFi prices, such as market liquidity, regulation, or technology adoption. For investors, these results indicate that market efficiency alone is not enough to predict DeFi price movements. Investors may need to focus on analyzing other factors, such as market sentiment, technology adoption, and liquidity, in order to make better investment decisions. Relying solely on market efficiency to make decisions may not provide significant benefits.

The Influence of Price Liquidity and Market Efficiency on Price Changes in Decentralized Finance (DeFi).

The results of data processing show that Price Liquidity and Market Efficiency have a significant effect on The DeFi prices. This is consistent with the findings by Cumming and Johan (2018), who emphasized that market liquidity and efficiency not only play an individual role but also have significant interactions in determining the price of assets in the crypto market. Market efficiency and high liquidity collaborate to improve price quality and reduce market risk (Cumming et al.,

2019). Auer, R., & Claessens, S. (2020) highlights the important role of liquidity and market efficiency in pricing in the DeFi market. They found that more liquid DeFi markets tend to have more stable and efficient prices. Market efficiency in DeFi is also linked to rapid price adjustments to new information, showing how these two factors play a role in reducing price volatility (Auer & Claessens, 2020). Liu, Y., & Tsyvinski, A. (2021) explored the relationship between liquidity, market efficiency, and asset prices in the DeFi market. They found that high liquidity and good market efficiency in DeFi protocols such as Uniswap and Sushiswap contribute to more stable prices and are reflective of new market information. This research supports the hypothesis that market liquidity and efficiency simultaneously affect prices in the DeFi ecosystem (Y. Liu & Tsyvinski, 2021). Liquidity and efficiency together create a market environment conducive to reasonable, stable, and trustworthy pricing. This means that strategies to improve one aspect without considering the other may not be effective in creating a completely stable and efficient market. DeFi prices are heavily influenced by liquidity conditions and market efficiency. In other words, DeFi markets that want to create more stable asset prices and reflect on fundamental value should focus on efforts to simultaneously increase market liquidity and efficiency. When liquidity and efficiency are at a high level, DeFi prices tend to be more stable, reflect accurate market information, and are more difficult to manipulate. It also shows that in the long run, good liquidity management and market efficiency can increase the attractiveness of the DeFi market for institutional and retail investors.

Investors can develop better investment strategies by considering market liquidity and efficiency when choosing DeFi assets. So that it can assess risks and opportunities more accurately, as well as make more informed investment decisions. By improving market liquidity and efficiency, the crypto ecosystem can experience more stable growth and broader innovation, leading to greater adoption and long-term success. A more liquid and efficient DeFi market can influence the global financial ecosystem by offering a better and more affordable alternative to traditional financial services.

Conclusions and Suggestions

Conclusion

Based on the results of the analysis and discussion that has been carried out in the research, the following conclusions can be drawn:

1. Price liquidity has a positive but statistically insignificant effect on DeFi prices
2. Market Efficiency has a negative effect on DeFi Prices.
3. Price Liquidity and Market Efficiency have a negative effect on DeFi Prices.

Suggestion

Based on the findings and conclusions of this study, several suggestions can be proposed to enhance future research and support decision-making in the development of the DeFi ecosystem. The suggestions given by the researcher are as follows.

1. Investors should assume that liquidity cannot be the only reference in making investment decisions in the DeFi market. While liquidity is important, investors need to consider other factors such as market sentiment, global volatility, and technological developments. This can lead to the use of more adaptive trading strategies, such as asset diversification or the use of algorithms that

consider many variables at once. Liquidity providers need to acknowledge that their contribution to liquidity may not always affect the price as expected. Therefore, a more comprehensive risk management strategy, including risk assessments involving external market conditions, may be necessary to protect their capital from unexpected volatility. Regulators may need to adopt a more comprehensive approach to monitoring and regulating the DeFi market. While liquidity is an important aspect, more holistic regulation should include oversight of market volatility, systemic risk, and financial stability affected by new technologies and innovations.

2. The insignificance of the influence of market efficiency on the DeFi prices suggests that regulation focused on improving efficiency may not be enough to control price volatility or drive price stability in the DeFi ecosystem. Therefore, policymakers need to consider other factors such as investor protection, increased transparency, and operational and technological risk mitigation. For investors, these results indicate that market efficiency alone is not enough to predict the DeFi price movements. Investors may need to focus on analyzing other factors, such as market sentiment, technology adoption, and liquidity, in order to make better investment decisions. Relying solely on market efficiency to make decisions may not provide significant benefits.
3. To support the healthy development of the DeFi in Indonesia, regulators need to take practical steps. First, prioritize investor education through programs that cover the risks and benefits of the DeFi, blockchain technology, and digital financial literacy. Second, develop a risk monitoring system to identify potential issues such as price volatility and market manipulation. Third, develop flexible regulations to accommodate innovation while protecting consumers. Finally, collaborate closely with DeFi industry players to gain input and encourage best practices.

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