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Inflation, exchange rate, and stock return: The evidence from the LQ45 index constituents in Indonesia

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ABSTRACT

Economic factors affect companies, especially those listed in the capital market. Consequently, it fundamentally affects investors' wealth, reflected by the stock price movement. Accordingly, this study aims to investigate and analyze the influence of inflation and exchange rate as related ones on stock return. The population comes from 20 coherent non-financial companies selected as LQ45 index from 2016 to 2022. Then, this study applies the Slovin formula with a 10% error margin to determine the sample size of 17, taken by a simple random sampling method. Also, it uses the regression model with pooling data and t-statistic to examine stock return determinants. Once meeting classical assumptions, this study checks the relationships. Its result demonstrates a positive influence of inflation on stock return, confirming the perspective declaring common stock becomes the hedging tool on inflation. Meanwhile, the IDR/USD exchange rate negatively associates with this return: The more powerful the US Dollar, the more diminished the stock price of non-financial companies belonging to the LQ45 index.

Keywords: exchange rate, inflation, LQ45 index, non-financial companies, polling regression model, stock return

INTRODUCTION

The capital market is the transaction place for the stocks as one of the instruments (Hartono, 2017; Jensen & Jones, 2019). This transaction happens between the company and investors during an initial public offering (IPO). In this event, the company and its underwriters set the share price to obtain fresh funds from the market (Widyawati et al., 2019). Through this activity, the portion of the equity increase; therefore, its capital structure will be better (Harahap et al., 2020). After the IPO, the transactions also happen based on the supply and demand among investors to determine the market price (Hartono, 2017).

One of the stock groups becoming the trading preference for investors is the LQ45 index in the secondary market. This index consists of 45 chosen shares based on capitalization and liquidity, reflected by their entrance into the top 60 regular average market value and transaction during the last twelve months, respectively (Hartono, 2017), and renewed twice a year: February and August (Hartono, 2017; Pratama, 2019).

Based on the monthly observation from January 2016 to December 2022 in Figure 1, the LQ45 index fluctuated and formed three tendencies. Firstly, the rising trend happened from the end of January 2016 at 799.98 to January 2018 at 1,100.28. Secondly, the diminishing occurred between the end of February 2018 at 1005.28 and March 2020 at 691.13. Finally, the trend increased from the end of April 2020 at 713.64 to December 2022 at 937.18.

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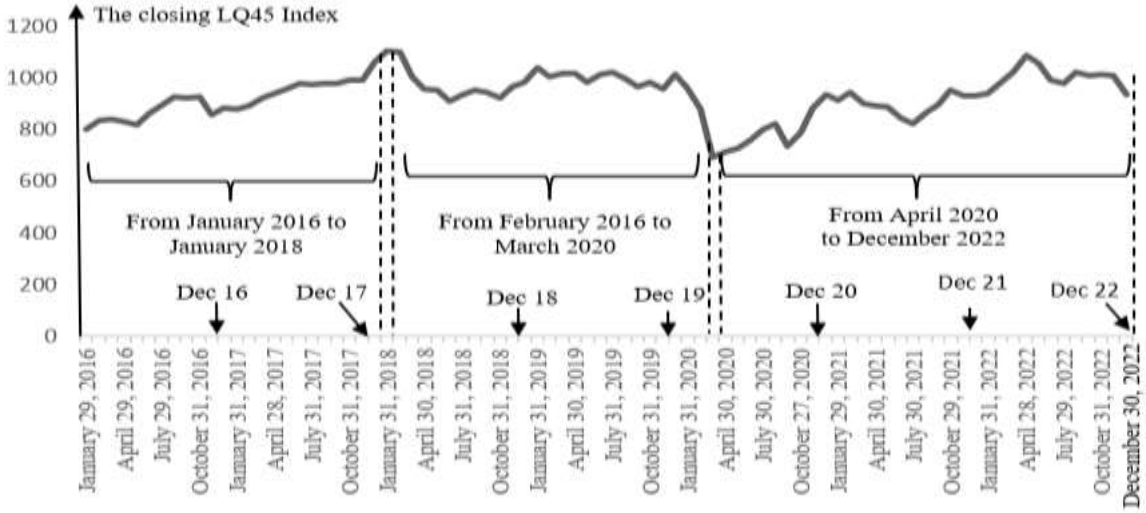

Figure 1. The closing LQ45 index at the end of the month
between January 2016 and December 2022
Source: www.finance.yahoo.com

The LQ45 index fluctuation stimulates this study to investigate the determinants of the stock return of its constituents. Denoting the previous research, the related scholars try to associate this return with economic factors, such as inflation (Ali et al., 2023; Dudesy et al., 2018; Ekadjaja & Dianasari, 2017; Eldomiaty et al., 2020; Goh et al., 2022) and exchange rate (Adebowale & Akosile, 2018; Amarkhil et al., 2021; Ekadjaja & Dianasari, 2017; Goh et al., 2022; Mayasari, 2021). However, no consensus is reachable.

Regarding the association between inflation and stock return, the previous studies still demonstrate a positive sign (Ali et al., 2023; Dudesy et al., 2018; Ekadjaja & Dianasari, 2017) and a negative mark (Dudesy et al., 2018; Eldomiaty et al., 2020), and no evidence (Ali et al., 2023; Goh et al., 2022; Mayasari, 2021). Similarly, the relationship between exchange rate and stock return is also contradictory, as evidenced by the studies proving a positive mark (Adebowale & Akosile, 2018; Amarkhil et al., 2021; Ekadjaja & Dianasari, 2017) and a negative sign (Goh et al., 2022). Based on the incompatible evidence, this study intends to examine and analyze the effect of inflation and exchange rate on the return of the stocks selected as the LQ45 index in the Indonesian capital market from 2016 to 2022.

LITERATURE REVIEW

One of the fundamental analyses of the stock price is the economic-based approach. It is due to the strong relationship between capital market performance and macroeconomic factors: inflation and exchange rates (Tandelilin, 2017). Inflation is the increasing price of goods and destroys public purchasing power and money value. Moreover, society members try to be speculative by purchasing marketable securities, such as stocks, to anticipate them (Sukirno, 2019). If they buy stocks, their prices in the capital market will elevate (Hartono, 2017). This circumstance gets proven by Ekadjaja and Dianasari (2017), reporting a positive tendency of inflation on stock return. Using several sectors in the Indonesian stock exchange, Dudesy et al. (2018) locate the positive association in agricultural firms. However, negative association exists in financial, infrastructure, public work, and transportation. Also, Ali et al. (2023) demonstrate that inflation positively correlates with Indian CNX auto, bank, finance, FMCG, MNC, Pharma, and PSU bank indexes. Unfortunately, inflation does not relate to IT, metal, and energy indexes. Based on this information, this research formulates the first hypothesis:

H_1: Inflation positively affects the share return.

The exchange rate demonstrates how much domestic currency is needed to get foreign. The local currency will depreciate if its value becomes more to obtain foreign (Sukirno, 2019). In the international trade context, it will stimulate export for domestic companies because of the more

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inexpensive products, according to the importers (Alfaro, 2017). Therefore, the firm revenue grows and attracts public investors to purchase the shares of the related firms, leading to an increasing stock market price (Cynthia & Salim, 2020). This positive tendency gets affirmed by Adebowale and Akosile (2018), Ekadjaja and Dianasari (2017), and Amarkhil et al. (2021) after investigating the effect of Nigerian Naira/USD, Indonesian Rupiah (IDR)/USD, and Pakistani Rupee/USD on stock return, respectively. Based on this information, this research formulates the second hypothesis:
H_2: The IDR/USD exchange rate positively affects the share return.

METHOD

Variables and their related source

Two types of variables exist in the study. Firstly, the dependent is the stock return. In calculating it, this study uses the yearly based- total approach, as Hartono (2017) describes. Moreover, the stock name of LQ45 from 2016 to 2022 is obtainable from the website of the Indonesian Stock Exchange, and their stock price is from www.finance.yahoo.com. Secondly, the independent consists of inflation and the exchange rate based on the midpoint IDR/USD at the end of the year. They come from the Indonesian Central Agency on Statistics and the Bank Indonesia website, respectively.

Population and Samples

The population contains 20 shares from non-financial firms consistently selected as the LQ45 index between 2016 and 2022. Furthermore, this study utilizes the Slovin formula in the first equation cited from Firdaus (2021) with an error margin (em) of 10% to determine the total samples (ts) representing the population number (pn).

$$ts = \frac{pn}{1+pn(em)^2} \quad (1)$$

Based on the first formula, total samples = $\frac{20}{1+20(10\%)(10\%)} = \frac{20}{1.20} = 16.67 \approx 17$ (rounded). Then, 17 shares are taken by simple random sampling technique, and their name is available in the first table.

Table 1. The name of the shares as the samples

No.	Code	The name of the company
1.	AKRA	AKR Corporindo Tbk.
2.	ASII	Astra International Tbk.
3.	BSDE	Bumi Serpong Damai Tbk.
4.	GGRM	Gudang Garam Tbk.
5.	ICBP	Indofood CBP Sukses Makmur Tbk.
6.	INCO	Vale Indonesia Tbk.
7.	INDF	Indofood Sukses Makmur Tbk.
8.	INTP	Indocement Tunggal Prakarsa Tbk.
9.	JSMR	Jasa Marga (Persero) Tbk.
10.	KLBF	Kalbe Farma Tbk.
11.	PGAS	Perusahaan Gas Negara Tbk
12.	PTPP	PP (Persero) Tbk.
13.	SMGR	Semen Indonesia (Persero) Tbk.
14.	TLKM	Telekomunikasi Indonesia (Persero) Tbk.
15.	UNTR	United Tractors Tbk.
16.	UNVR	Unilever Indonesia Tbk.
17.	WIKA	Wijaya Karya (Persero) Tbk.

Source: Processed from database

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The data-analyzing technique

The research employs the regression model and the t-statistic to examine the association proposed in the hypotheses. Furthermore, the second equation presents the intended model.

$$SR_{it} = \beta_0 + \beta_1 INF_t + \beta_2 EXR_t + \varepsilon_{it} \quad (2)$$

Note: SR = stock return, INF = inflation, EXR = exchange rate, i = stocks as the cross-sectional unit, t = time-series unit, ε = residual of the regression model.

This model in equation two must meet four classical assumptions. The first and second are that the residuals must follow the normal distribution and be free from heteroskedasticity. Furthermore, this study uses the Jarque-Bera and White testing to detect them, as Gujarati et al. (2019) depict. The third and fourth are that autocorrelation and multicollinearity do not occur, and this study uses the runs and test and variance inflation factor detection, as Ghozali (2021) explains.

RESULT

Descriptive statistics

This study employs 17 companies as samples with seven years; therefore, 119 observations exist, and the second table below demonstrates their descriptive statistics of the utilized variable. In this table, the stock return has minimum and maximum of -0.66 and 0.72 with a mean and standard deviation (SD) of -0.0181 and 0.24372. The lowest and highest inflation is 1.61% and 5.51%, and the average and SD are 3.0771% and 1.18491. The bottommost and uppermost IDR/USD exchange rates are IDR13,436.00 and IDR15,592.00, with mean and SD of IDR14,190.2857 and 671.29507.

Table 2. The descriptive statistics for stock return, inflation, and exchange rate

Variable	N	Minimum	Maximum	Average	Std. Deviation
Stock Return (Decimal)	119	-0.66	0.72	-0.0181	0.24372
Inflation (%)	119	1.68	5.51	3.0771	1.18491
Exchange rate (IDR/USD)	119	13,436.00	15,592.00	14,190.2857	671.29507

Source: Output of IBM SPSS 19

The second figure displays the Jarque-Bera normality testing result with the probability of the Jarque-Bera statistic of 0.485596. Because it is more advanced than a 5% significance level, the residuals are normally distributed.

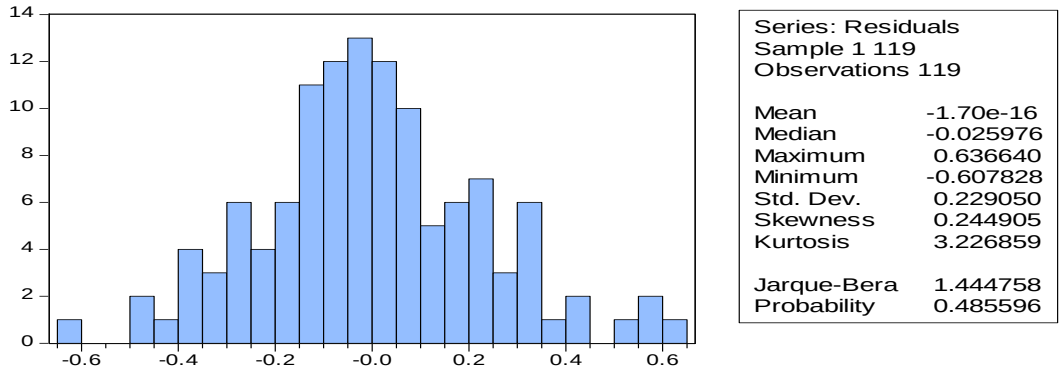

Figure 2. The Jarque-Bera normality testing result
Source: E-Views 6

The second table informs the White heteroskedasticity testing result with the probability of the observed R-square of 0.0614. Because it is above a 5% significance level, heteroskedasticity is unavailable in this regression model.

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Table 2. The White Heteroskedasticity testing result
RESID^2 = f(INFR, INFR^2, INFR*EXR, EXR, EXR^2)

F-statistic	2.195436	Probability of F-statistic (5,113)		0.0596
Observed R-squared	10.53649	Probability of Chi-Square (5)		0.0614
Variable	Coefficient	Std. Error	t-Statistic	Probability
C	21.21306	15.68404	1.352525	0.1789
INF	0.907177	0.572365	1.584963	0.1158
INF^2	0.007606	0.015289	0.497493	0.6198
INF*EXR	-6.76E-05	4.11E-05	-1.647415	0.1023
EXR	-0.003199	0.002331	-1.372643	0.1726
EXR^2	1.21E-07	8.64E-08	1.396828	0.1652

Source: Modified Output of EViews 6

The third table exhibits the autocorrelation examining result based on runs with the asymptotic significance (2-tailed) for a Z-statistic of 0.617 (see Panel A). It surpasses a 5% significance level; consequently, the model is free from this autocorrelation. For multicollinearity, the variance inflation factor for INF and EXR is similar: 1.532 (see Panel B of the third table). Because this value is lower than 10, the model is free from multicollinearity.

Table 3. The autocorrelation and multicollinearity detection result

Panel A. Autocorrelation testing result based on the runs			
Test value based on mean	0.0000	Number of runs	63
Cases < Test Value	63	Z-statistic	0.500
Cases >= Test Value	56	Asymptotic Sig. (2-tailed)	0.617
Total Cases	119		
Panel B. Variance inflation (VIF) for the independent variables			
VIF for INF	1.532		
VIF for EXR	1.532		

Source: Output of IBM SPSS 19

The fourth table describes the estimation result of the regression model. In this table, the probability of the t-statistic is fewer than the 5% significance level: 0.0020 for a positive sign of INF. Therefore, the first hypothesis is acceptable. Unfortunately, the second one is unacceptable because of the negative symbol of EXR, although the probability is less than 5%.

Table 4. The estimated regression model: The effect of inflation and exchange rates on stock return

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	1.838649	0.519543	3.538971	0.0006
INF	0.070423	0.022216	3.169940	0.0020
EXR	-0.000146	3.92E-05	-3.726114	0.0003
R-squared	0.116779	F-statistic		7.668718
Adjusted R-squared	0.101551	Probability (F-statistic)		0.000745

Source: Modified Output of EViews 6

DISCUSSION

This study agrees to take the first hypothesis pronouncing a positive influence of inflation on stock return. By confirming this positive sign, the common stock becomes the hedging tool on inflation, according to Isnandari and Chalid (2017). If the inflation increase, the investors purchase the shares to protect their wealth from meaningless money. Besides, this evidence supports Dudesy et al. (2018) when investigating this relationship in Indonesian agricultural sectors. Additionally, this positive fact aligns with Ekadjaja and Dianasari (2017) utilizing the consumer price index to measure inflation and the Indonesian composite index to measure the market return. Lastly, Ali et al. (2023) confirm that inflation positively associates with CNX auto, bank, finance, FMCG, MNC, Pharma, and PSU bank indexes.

Unfortunately, this study discards the second hypothesis demonstrating a positive impact of the IDR per USD exchange rate on stock return. In its place, it declares that this return is negatively affected by this exchange rate. When IDR/USD increases or USD strengthens, investors tend to buy dollars to get gains. To realize this intention, they sold the stocks on the capital market, leading to a cut in market price. With this negative propensity, this study affirms Goh et al. (2022), documenting the negative effect of IDR/USD on the stock return of Indonesian tourism firms.

CONCLUSION

Allocating money in stocks in the capital market becomes the alternative for public investors to prosperity. Hence, their consideration of economic factors, i.e., inflation and exchange rates, to get the return is essential. This research aims to prove their impact on this return by investigating 17 non-financial companies in the LQ45 index as samples in the Indonesian capital market between 2016 and 2022. After checking the planned hypotheses, this study concludes that inflation positively affects stock return. However, the IDR/USD exchange rate is negatively related to this return. As a limitation, the adjusted R-square of this regression model in Table 4 is low: 0.101551, indicating its inability to predict the return. Hence, the succeeding researchers should employ additional determinants based on financial report ratios, i.e., profitability, activity, liquidity, and solvability, as well as other economic features, i.e., cash supply, interest rate, unemployment, and economic growth.

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