

Economic Risk and Stock Market Development: Evidence from Indonesia Stock Exchange

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Abstract. *The main objective of current research is to examine the long-run relationship between several economic risk factors which include the exchange rate, rates of interest, inflation, and the stock market capitalization in Indonesia. This study utilized secondary data from the first quarter of 2000 until the fourth quarter of 2020. This study employs a quantitative research design with descriptive approach. Before process the data using the Johansen Cointegration test and Vector Error Correction Model (VECM), the stationary of the data was check by employing the Ng-Perron unit root test. The Eviews-10 program is used to process the data. Ng-Perron unit root test indicated that time series is stationary at the first difference. Result of Johansen Cointegration test confirmed that there is a long-term relationship between economic risk which consists of the USD exchange rate against the Rupiah, interest rates, inflation figure, and stock market capitalization. The VECM results indicate that these economic risk indicator has a negative effect on the development of the capital market in Indonesia. The study recommends that the government and policy maker should implement economic risk mitigation through monetary policy instruments to enhance the Indonesia capital market development.*

Keywords: *Economic Risk, Exchange Rate, Interest Rate, Inflation Rate, Stock Market.*

INTRODUCTION

Capital market performance is not only determined by the company's internal factors, but also by the company's external factors (Thuy, 2018; Yuniningsih et al., 2019). Both of these factors are fundamental factors that are often used as a basis for stock market participants to make investment decisions. Fundamental factors include macro fundamental factors (external) and micro fundamental factors (internal). Macro fundamental factors in terms of capital market analysis are called country fundamental factors, these factors are uncontrollable so that companies cannot control them. Macro-fundamental factors include: economic, social, cultural, demographic and environmental,

political power, government and law, technology, and competition (Sugiyantol et al., 2020).

Investing in the capital market is an investment full of uncertainty, so stock exchange players will be exposed to high risks (Adebayo et al., 2022). Risks can be classified into risks that can be eliminated by diversification and risks that cannot be eliminated by diversification. The risk that can be eliminated by diversification is called unsystematic risk, and the risk that cannot be controlled by diversification is called systematic risk or also known as market risk (Vongphachanh & Ibrahim, 2020).

Systematic risk or market risk is the risk arising from macroeconomic fundamental factors; inflation, interest rates, exchange rates, and economic growth. Systematic risk has the potential to affect capital market performance, company performance, and company value. Macroeconomic fundamental factors; Inflation, interest rates, exchange rates and economic growth are factors that are of great concern to market participants. Changes that occur in this factor can result in changes in the capital market, namely increasing or decreasing stock prices. The volatility of stock prices in the capital market can affect the ups and downs of stock market capitalization (Nugraha, 2020).

This research was motivated by the controversy over the results of previous studies, including studies conducted by (Wahyudi, 2018), (Setiawan, 2020), (Prawoto & Putra, 2020), (Fuad & Yuliadi, 2021). The finding of a study (Wahyudi, 2018) conclude that interest rates and exchange rates a have negative impact and significant statistically on Jakarta Composite Index. Another study conducted by (Setiawan, 2020) concluded that inflation affects the Jakarta Composite Index positively and is not significant statistically. Meanwhile the exchange rate has a negative impact on Jakarta Composite Index and is not significant statistically. Furthermore, the study of (Prawoto & Putra, 2020) concluded that inflation has a negative effect on the composite stock price index both in the short term and long term. Whereas the exchange rate has a positive effect on the composite stock price index in both short term and long term. Moreover, the study of (Fuad & Yuliadi, 2021) concluded that inflation and exchange rate have a negative and significant effect on the Indonesian Composite Stock Price Index. Meanwhile, the interest rate has a positive and significant affect on the Indonesian Composite Stock Price Index.

This study is limited to macroeconomic fundamentals with indicators of the USD exchange rate against the Rupiah, interest rates and inflation. This is because macroeconomic factors are the ones that receive the most attention from capital market players and influence the development of the stock market. The objective of this research examine the long-run relationship between several economic risk factors which include the exchange rate, rates of interest, inflation, and the stock market capitalization in Indonesia.

LITERATURE REVIEW

A Brief History of Indonesia Capital Market

In the development of the capital market in Indonesia, buying and selling activities Stock exchange began in the 19th century. On 14 December 1912 the Amsterdamse Effectenbueurs established a stock exchange branch in Batavia (now Jakarta). The capital market at that time was established by the Dutch East Indies government for the benefit of the colonial government or VOC (Herison et al., 2022). In brief, the milestones of capital market development in Indonesia can be seen as follows:

- a. 14 December 1912: The first stock exchange in Indonesia is formed in Batavia by the Dutch East Indies government
- b. 1914-1918: Stock exchange in Batavia was closed during world war 1
- c. 1925-1942: The stock exchange in Jakarta was reopened with the stock exchange in Semarang and Surabaya
- d. Early 1939: Due to political issues (World War II) the stock exchange in Semarang and Surabaya are closed
- e. 1942-1952: The stock exchange in Jakarta was closed again during the war world II
- f. 1952: The stock exchange in Jakarta was reactivated by Law Capital Market Emergency Act.
- g. 1956-1977: Trading on the stock exchange was a vacuum
- h. August 10, 1977: The stock exchange was re-inaugurated by the president Suharto. JSX is run under BAPEPAM (Executing Agency Capital market).
- i. 1977-1987: Trading on the stock exchange was very sluggish. Number of listed company until 1987 only reached 24.

- j. 2 June 1988: The Indonesian Parallel Exchange (BPI) began operations.
- k. 6 June 1989: The Surabaya Stock Exchange (BES) started operations.
- l. 2002: JSX started implementing remote trading system (remote trading).
- m. 2007: Merger of BEJ and BES to become the Indonesia Stock Exchange (IDX).

Stock Market Capitalization

Large market capitalization is generally one of the attractions of investors in choosing stocks (Widyanata & Bashir, 2020). Market capitalization can be calculated by multiplying the number of shares outstanding by the price per share traded. According to (Igoni et al., 2020), stock market capitalization is the prevailing price of securities. Market capitalization reflects the current value of the company's assets which is a measure of the size of the company (Omodero, 2020).

The greater the market capitalization of a company, the larger the size of the company (Ukhriyawati & Dewi, 2019). Investors tend to hold a stock longer if they have a larger market value. The greater the market capitalization of a stock, the longer investors hold their share ownership, because investors assume that large companies will tend to be more stable from a financial standpoint, have smaller risks and have good prospects in the long term with the hope of a large return (Sumilat et al., 2021). So that investors feel safer with the investment they have made.

Economic Risk

Risk is the potential for an adverse event caused by uncertainty over the occurrence of an event (Jedynak & Bąk, 2020). Risk comes from the business environment, both internal as well as external. Economic risks can be in the form of exchange rate risk, interest rate risk, inflation risk and etc.

Exchange rate risk is the risk associated with fluctuations in the exchange rate of the domestic currency with the value of other countries' currencies (Mouna & Anis, 2016). If small fluctuations occur, the uncertainty value is relatively low and reasonable. However, if the movement is not controlled it can lead to uncertainty when making economic decisions for business. Another impact is the company's financial stability will be disrupted. Exchange rates are able to provide information about all aspects of business,

from income, financing, operations, to investment. If the movement leads to things that are detrimental to the exchange rate, it will hinder the profit for the company, it will also have an impact on the movement of cash flows and company value. One of the things that causes exchange rate risk is the fundamentals of supply and demand in the foreign exchange market.

Interest rate risk is the risk that arises due to changes in the prevailing interest rates (Huy et al., 2020). Basically, stocks and interest rates are two opposite things. When interest rates tend to rise, stock prices tend to fall. Conversely, when interest rates tend to fall, stock prices tend to rise. Interest rate risk is the risk that arises due to changes in the prevailing interest rates. Basically, stocks and interest rates are two opposite things. When interest rates tend to rise, stock prices tend to fall. Conversely, when interest rates tend to fall, stock prices tend to rise. From the company's perspective, interest rates are the cost of capital. If the company obtains financing from debt, then the company must bear the interest expense of the loan and the interest expense will affect the company's net profit. So, when interest rates rise, the company's net profit is expected to fall due to increased interest expenses and vice versa. Any increase or decrease in the company's net profit will immediately be reflected in its share price on the stock exchange.

Inflation risk is a risk that arises due to an increase in the price of goods in general which has an impact on reducing the purchasing power of each unit of currency (Devia, 2019). High inflation has an adverse effect on economic stability. Increased inflation can lead to high prices for inputs or raw materials, decreased income and profits, low consumer purchasing power, and a slowing economy. If inflation continues to increase, then the return on stock investment will also decrease. In this condition, the stock price will fall.

RESEARCH METHODS

Research Design

This study employs a quantitative research design with descriptive approach, a technique for addressing issues in research including data in the form of numbers and statistical models. The term quantitative research approach refers to techniques that

explore certain populations or samples, gather data using research equipment, and analyze that data statistically in order to evaluate the hypotheses that have been established.

Data

This study utilized secondary data from the first quarter of 2000 until the fourth quarter of 2020. Data for exchange rates and interest rates were gathered from the Bank Indonesia directory. Inflation data were obtained from the Statistics Indonesia directory. Whereas information on stock market capitalization was taken from the Indonesia stock exchange directory.

Empirical Hypothesis

The research's hypothesis examine if there is a relationship between several economic risk factors, such as the exchange rate, rates of interest, inflation, and the capitalization of the Indonesian stock market.

Hypothesis 1

Ho : Exchange rates and stock market capitalization have no long-run relationship.

H1 : Exchange rates and stock market capitalization have a long-run relationship.

Hypothesis 2

Ho : Interest rates and stock market capitalization have no long-run relationship.

H1 : Interest rates and stock market capitalization have a long-run relationship

Hypothesis 3

Ho : Inflation and stock market capitalization have no long-run relationship.

H1 : Inflation and stock market capitalization have a long-run relationship

Research Model and Estimation Approach

The study attempts to analyze long-run relationship between several economic risk factors, such as the exchange rate, rates of interest, inflation, and the stock market capitalization of the Indonesian stock exchange. The empirical model is given as follow:

$$\ln SMC_t = \beta_0 + \beta_1 \ln EXR_t + \beta_2 INT_t + \beta_3 FLA_t + \varepsilon_t \quad (1)$$

where, $\ln SMC_t$ is stock market capitalization of the Indonesian stock exchange at time t , $\ln EXR_t$ is exchange rate of USD against Rupiah at time t , INT_t is interest rate at time t , FLA_t is inflation at time t , and ε_t = error term. For an empirical study, we applied the unit root test, Johansen cointegration, and Vector Error Correction Model (VECM) technique.

Ng-Perron Unit Root Test

Unit root tests also called stationary test. Unit root test is use to test whether the data has a stationary patter or stable (Rizal & Akbar, 2015). Unit root test is use to determine if the data are stationary in level, first differences, or second differences. The series is considered to be integrated in order 1 when the data is different just once before being transformed to stationary. The greater the order of integration, the longer the conversion times into stationary. Ng-Perron unit root test was employed in this study. The null hypothesis for Ng-Perron unit root test is the time series is non non-stationary or presence of a unit root. The alternative hypothesis is the time series is series is stationary or absence of a unit root.

To determine whether the time series data is stationary by comparing the Elliott-Rothenberg-Stock DF-GLS (Ng-Perron) statistic to MacKinnon's critical value at any significant level. If the absolute value of the Elliott-Rothenberg-Stock DF-GLS (Ng-Perron) statistic is greater the MacKinnon's critical value, so, the null hypothesis is rejected, means the data in a time series is stationary, or vice versa.

Johansen Cointegration Test

Cointegration concept proposed by Engle & Granger (Pranyoto et al., 2017). Cointegration is closely related to the availability of a long-term relationship among the variable in the series. If time series data is cointegrated, then there is a long-term relationship between data the time series. The Johansen cointegration test was utilized in current study. Johansen's methodology is typically used where all variables in the system are stationary at the first difference or I(1).

Vector Error Correction Model (VECM)

Vector Error Correction Model (VECM) can be classified as the estimation on dependent variable, Y returns to equilibrium after a change in an independent variable, X by using multiple time series model. Error Correction Model (ECM) describes how variables Y and X behave in the short run consistent with a long-run cointegrating relationship.

FINDINGS AND DUSCUSSION

Unit Root Test

Table `1 summarized the result of Ng-Perron unit root test for the series lnSMC, lnEXR, INT, and FLA.

Table 1. Result of Ng-Perron Unit Root Test at Level

Factors	Ng-Perron Statistic	McKinnon Value			Status
		1%	5%	10%	
lnSMC	-0.908074	-2.593468	-1.944811	-1.614175	I(0)
lnEXR	-0.834199	-2.593121	-1.944762	-1.614204	I(0)
INT	-1.729987	-2.593468	-1.944811	-1.614175	I(0)
FLA	-1.647410	-2.593121	-1.944762	-1.614204	I(0)

The result of the Ng-Perron unit root test at level as displayed in Table 2 seen that absolute value of Ng-Perron statistics is smaller than the McKinnon Value. This result indicated that the null hypothesis can not be rejected. Therefore, all variables are concluding non stationary at the level or all variable has zero order integration. Then we extended the unit root test at first difference. Table 2 summarized the result of Ng-Perron unit root test for all time series at first difference

Table 2. Result of Ng-Perron Unit Root Test at First Difference

Factors	Ng-Perron Statistic	McKinnon Value			Status
		1%	5%	10%	
lnSMC	-6.894226	-2.593468	-1.944811	-1.614175	I(1)
lnEXR	-9.976070	-2.593468	-1.944811	-1.614175	I(1)
INT	-3.759090	-2.593468	-1.944811	-1.614175	I(1)
FLA	-5.693560	-2.594563	-1.944969	-1.614082	I(1)

Based on the result of the Ng-Perrom unit root test at first difference as summarized in Table 2, it can be seen that the absolute value of Ng-Perron statistics is greater than the McKinnon value, so the null hypothesis is rejected. Therefore, we can conclude that lnSMC, lnEXR, INT, and FLA are stationary at first differences. In another word, the time series can be denoted as the I(1) series. As a consequence, the estimation by utilizing the vector error correction model could be carried out.

Johansen Cointegration Test

The presence of co-integrating relationships between economic risk namely exchange rate, interest rate, inflation, and stock market capitalization are going through Vector Error Correction Model (VECM) test by applying the Johansen procedure (Johansen and Juselius, 1990 & Johansen, 1991). The results of the Johansen co-integration test can be seen by comparing the Trace Statistical value with the critical value at the 5% confidence level. If the trace statistical value is greater than the critical value at the 5% confidence level and is greater than the Eigenvalue, it can be concluded that the two variables are cointegrated with each other. The result of Johansen cointegration test was tabulated in Table 3.

Table 3. Result of Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value 0.05	Prob
None*	0.895362	2887.563	47.85613	0.0346
At most 1*	0.258236	42.24675	29.79707	0.0001
At most 2*	0.151037	18.05005	15.49471	0.0202
At most 3*	0.057388	4.787103	3.841466	0.0287

The value of trace statistics Table 3 is greater than the critical value at the 5% confidence level and is greater than the Eigenvalue, so it can be that there are three cointegration relationships in the long-run of the underlying variable in the model using the Johansen cointegration approach. The null hypothesis of no cointegration is rejected at a 5% level of significance. It revealed that a long-run equilibrium relationship exists between the three economic risks and stock market capitalization.

Vector Error Correction Model (VECM)

Johansen (1991) proposes the Vector Error Correction Model. It is utilized to investigate the long-term co-integrating connection between dependent and independent variables. Table 4 presented the results of VECM for the economic risk factor which affect the development of the stock market in Indonesia in the long-run.

Table 4. Result of VECM

Economic Risks	Coefficient	Standard Error	t-Statistic	Prob
C	0.139993			
D(lnEXR)	-0.078646	0.02453	-3.20574	0.0000***
D(INT)	-0.345275	0.08093	-4.26612	0.0230**
D(FLA)	-0.002774	0.04552	-3.06093	0.0275**

Note: *, **, *** denotes rejection of the hypothesis at 10%, 5% and 1% significance level.

The following is the equation of our model based on the result of VECM which summarized in the Table 4

$$\ln SMC_{t-1} = 0.139993 - 0.078646 \ln EXR_{t-1} - 0.345275 INT_{t-1} - 0.002774 FLA_{t-1}$$

Based on the VECM regression results, the expected signs for all independent variables are in accordance with general theoretical theories and all economic risk indicators substantially impact on stock market capitalization at different significance levels of 5% and 1%. The t-statistic of the exchange rate is -3.20574, which is significant at the 1% level, showing that there is a long-run relationship between the exchange and stock market capitalization. The co-integration results reveal that stock market capitalization is effect negatively by the exchange rate. The coefficient can be interpreted as when USD appreciated against Rupiah by 1%, stock market capitalization will decrease by 0.078646 points, all other factors constant. As a result, the stock market capitalization will drop if the US Dollar appreciates against the Rupiah (the Rupiah weakens), and vice versa. This is support the findings of the study conducted by Barakat et al. (2015), which found a causal link between share market capitalization and value exchange rates in developing countries.

The t-statistic of interest rate is -4.26612, which is significant at the 5% level, showing that there is long-run relationship between interest rate and stock market capitalization. The co-integration results reveal that stock market capitalization is negatively impacted by interest rates. The coefficient can be interpreted as when the interest rate increases by 1%, stock market capitalization will decrease by 0.345275 trillion, all other factors constant. The research by (Siska & Arigawati, 2019) is supported by this finding. The result is in accordance with the theory that states that interest rates and stock prices are inversely correlated. Rising interest rates will decrease the current value (present value) of the company's cash flow, so investment activities are uninteresting.

The t-statistic of inflation is -3.06093, which is significant at the 5% level, showing that there is long-run relationship between inflation and stock market capitalization. The co-integration results reveal that stock market capitalization is negatively impacted by inflation pressure. The coefficient can be interpreted as when the inflation level increases by 1%, stock market capitalization will decrease by 0.002774 trillion, all other factors constant. Inflationary pressure is caused by the instability of a country's economy. The depreciation of the rupiah exchange rate will push up domestic prices. Under conditions of interest rates that tend to increase, in general the price of shares will decrease, so that the stock market capitalization will also decrease.

CONCLUSION AND RECOMMENDATION

Based on the Johansen cointegration test, it can be concluded that there is a long-term relationship between economic risk, which consists of the USD exchange rate against the rupiah, interest rates, inflation figure and stock market capitalization. The VECM results indicate that these economic risk indicator has a negative effect on the development of the capital market in Indonesia. The study recommends that the government and policy maker should implement economic risk mitigation through monetary policy instruments to enhance the Indonesia capital market development.

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