Volatility Spillover on IDX Energy Sector

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Abstract*. This study aimed to determine the spillover volatility factors from the stock returns on IDX Energy Sector firms. It focused on 3 types of factors, including 1) economy, especially crude oil prices, 2) market, such as inflation, exchange rate, and real GDP growth, and 3) firm specific-factors, such as ROE, Firm Size, and DER. A total of 39 out of 66 firms were chosen for analysis while data was collected from 2011 to 2020. Furthermore, the Panel Data analysis method was used to examine the main aspects of stock return spillover volatility. The results showed that crude oil prices, inflation, exchange rates, and real GDP growth significantly partially affected stock returns in the Energy Sector, while ROE, Firm Size, and DER had no effect.*

Keywords. *Crude Oil Prices, Exchange Rate, Inflation, Real GDP Growth, Stock Return, Spillover Volatility*.

Abstrak. Penelitian ini bertujuan untuk menentukan faktor volatilitas tingkat keuntungan saham perusahaan sektor IDX Energi. Penelitian ini berfokus pada tiga faktor, yaitu 1) ekonomi, khususnya harga minyak mentah, 2) makro, khususnya, inflasi, nilai tukar dan pertumbuhan PDB riil, dan 3) faktor spesifik perusahaan yaitu, ROE, Ukuran Perusahaan dan DER. Total sampel penelitian sebanyak 39 perusahaan dari 66 perusahaan dianalisis dari periode tahun 2011 sampai dengan 2020. Selanjutnya, metode penelitian ini menggunakan data panel untuk menguji aspek utama dari volatilitas berlebih *return* saham. Hasil penelitian menunjukkan bahwa harga minyak mentah, inflasi, nilai tukar dan pertumbuhan PDB Riil berpengaruh signifikan pada tingkat keuntungan saham. Sedangkan, ROE, Ukuran Perusahaan dan DER tidak berpengaruh.

Kata kunci. Harga Minyak Mentah, Inflasi, Nilai Tukar, Pertumbuhan PDB Rill, Tingkat Keuntungan, Volatilitas.

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INTRODUCTION

The Energy sector is one of the main commodities in the modern economy, especially in the Coal, Oil, and Gas sub-sectors. This is because oil and coal are the main energy sources in almost all production processes and economic activities worldwide. They are among the cornerstones of development since provide the energy a country needs to grow economically.

Energy sector firms have capital-intensive, technology-intensive, high-risk, and non-renewable business characteristics and negatively affect the environment. This is normal for firms with high business risks and is sensitive to economic shocks. The volatility of stock prices in the energy sector is unpredictable, and the investors consider the existing risks to reflect the firm performance. In general, the stock price shows how a firm is developing over time. Energy sector stock movements experienced a negative growth trend in the last 3 years, from 2018 to 2021. The JCI recorded a return of -1.37% compared to the energy sector stock index return of -25.93 (Index Fact Sheet, January 2021).

The stock return rate is the profit computed as the difference between the investment values at sale and purchase. The factors that affect stock returns are divided into three groups, including the firm-specific, market, and economy (Scott, W.R, 2015).

Macro and micro conditions of a country affect the movement and fluctuation of stocks directly or indirectly. One of the global indicators is the world crude oil, precious metals, or gold prices that may catalyze the stock movement of energy sector firms. The upward trend in the world oil prices positively affects the stock price movements of oil and gas issuers since the movement harmonizes with the pattern in the global oil prices, the issuer's main concern (Komalasari, 2019). According to, (Tjandrasa & Sutjiati, 2016), world gold, oil prices, and interest rates affect the stock price index, contributing to the world economy.

One of the economy-wide factors that investors often focus on is the world oil price, which affects the global economy. In general, crude oil creates a chain effect for many industries globally. In oil-exporting countries, price increases are advantageous to firms. When they rise, investors focus on various types of oil and other mining commodities. (Prawirosaputro, 2017) stated that they significantly affect the stock price index. According to previous studies, changes in oil prices positively affect stock returns (Fardiansyah et al., 2018; Izza & Wulandari, 2019; Komalasari, 2019; Prawirosaputro, 2017; Rahmanto et al., 2016; Satyatama & Sumantyo, 2017).

Macroeconomic conditions in a country also determine stock fluctuations. In this study, important macro tenets include inflation, currency exchange rates, and GDP growth. Inflation is the general increase in prices in the economy from one period to the next. Similarly, the inflation rate is the percentage increase in prices in a given year compared to the previous one. (Fardiansyah et al., 2018)and (Ismanidar, 2017) stated that inflation positively affects stock movements in the energy sector. In case it is not managed properly, the resulting condition signals investors to sell their stock or limit activities. High inflation rates affect purchasing power, decrease consumption, reduce motivation or investment intentions, and lead to lower investment returns. (Fardiansyah et al., 2018)(Ismanidar, 2017) established that high inflation rates positively affect stock returns, while (Pardede et al., 2016b) contravened this assertion.

Exchange rate refers to the strength of a country's currency in relation to supply and demand changes, though it is also affected by other economic factors. For instance, high currency depreciation can be an indication of a weakening economy. A currency appreciation or depreciation may affect one stock both positively and negatively. When the domestic currency depreciates, investors sell stocks in the capital market. For example, the decline of the rupiah against foreign currencies, especially the U.S. dollar, negatively affected the economy and the capital market. Other studies show that the exchange rate may have a significant negative effect on stock returns (Agustin, 2016; Fardiansyah et al., 2018; Mouna & Anis, 2017; Pardede et al., 2016a; Satyatama & Sumantyo, 2017). According to (Fardiansyah et al., 2018; Pardede et al., 2016a; Satyatama & Sumantyo, 2017), currency exchange rates affect the mining stock index. The GDP growth is a positive catalyst to the economy and affects industrial and business growth. The development of the economic capital market is also important has a significant impact on the growth of s country. Additionally, unexpected changes in economic policies, such as monetary, fiscal, exchange rate, and trade policies, affect corporate profits. GDP growth positively influences stock movements in the capital market. (Abbass et al., 2019) established that economic growth significantly affects stock returns.

According to previous studies, financial ratios are essential in predicting future returns and relate to the stock market (Musallam RM, 2018). For instance, (Mohanty et al., 2013) revealed that firm-specific factors, including ROA, firm size, and leverage affect stock returns.

Industries and firms have unique and specific factors of concern to investors. The public may see the ratios from the financial statements to help understand the financial condition and projects future performance. This study focused on several factors, including Return on Equity (ROE), specifically a ratio of firm

profitability to its equity. The larger the ratio, the more effective the firm is in gaining profits from sales and investment. (Chandra et al., 2019)stated that the profitability variable affects stock returns, while (Sugiarti, Surachman, 2015) contravened this assertion.

Size is a common method used in empirical corporate finance to determine the main characteristics of a firm. It is assessed from a firm's total assets and calculated based on their logarithm. The greater the total assets, the greater the negative correlation with the firm stock returns. This relates to large-scale firms that have cost problems and tend to be mature and difficult to develop. However, this does not hold in small-scale firms that are still growing, and the impact on stock prices increases. According to (Abbass et al., 2019; Ardiansyah & Isbanah, 2017; Izza & Wulandari, 2019) firm size has no significant effect on stock returns, while (Mehmood et al., 2019) concluded that it affects stock price volatility.

The firm solvency proportion determines the ability to meet debt-related commitments. Dissolvability shows how much a firm depends on loans and banks. Several empirical studies found that solvency ability and stock returns correlated negatively. Moreover, the DER ratio shows the extent to which the firm can bear losses without endangering shareholders. It negatively correlates to stock returns, where the higher the debt ratio, the more a firm tends to be insolvable because of the greater debt burden. This condition decreases investor confidence, an assertion supported by (Abbass et al., 2019; Mehmood et al., 2019; Sugiarti, Surachman, 2015).

Most studies on stock and policy movements trends and their factors often focus on the financial sector only. However, this study explained and analyzed stock returns based on the conditions of volatility spillovers in each IDX Energy sector firm that has adjusted to the new industry classification 'IDX Industrial Classification (IDX-IC).' The commonly used classification in other industries worldwide was also examined based on economy-wide, market, and firm-specific factors. Furthermore, the Real GDP Growth variable was analyzed to determine the GDP growth on stock returns in the energy sector. The previous financial performance indicators, macroeconomics, and the world were also used to predict future stock returns.

RESEARCH METHODOLOGY

Stock returns closely relate to external and internal factors. This study consisted of three categories of independent variables, including 1) economy-wide factors, specifically the crude oil prices, 2) market factors, such as inflation, rupiah exchange rate, and GDP growth, and 3) firm-specific factors, including ROE, Firm Size, EPS, and DER. The dependent variable is the average annual stock return of a firm included in the IDX energy sector. This study used secondary, specifically the firm financial data for 2011-2020 and financial information on a macro and global basis. The criteria for selecting the sample involved firms included in the IDX energy sector, listed on the IDX since 2011-2020, not experience delisting/suspension, and have easily accessible financial data.

The total population comprised 66 firms in the IDX Energy sector. However, 27 were eliminated because they were only listed on the exchange during the study period, were suspended, or did not have complete financial data, remaining with 39.

Table 1. Variables and Measurements

Variable Name	Variable Type	Measurement
Stock returns	Dependent	*Annually Avg. Stock return*
World Oil Prices	Independent	*WTI Oil Prices*
Inflation	Independent	Annual Inflation
USD/IDR Currency Exchange	Independent	Middle Rate USD/IDR
GDP *Growth*	Independent	*Rill GDP growth*
ROE	Independent	*Return on Equity*
Firm Size	Independent	*Total Asset*
DER	Independent	*Debt to Equity Ratio*

STUDY HYPOTHESES

The hypotheses stated that the variables have different relationships, explained based on data availability and literature. This study was tested with statistical test tools to explain the effect between variables. Based on the described literature, the following hypotheses were tested.

H_1: The World Crude Oil positively affects the IDX Energy Sector stock returns.

H_2: The IDX Energy Sector negatively affects the stock returns.

H_3: The Currency Exchange negatively affects the Stock Return of the IDX Energy Sector.

H_4: The GDP Growth positively affects the IDX Energy Sector stock returns.

H_5: The ROE positively affects the IDX Energy Sector stock returns.

H_6: The Firm Size negatively affects the IDX Energy Sector stock returns.

H_7: The DER negatively affects the IDX Energy Sector stock returns.

STUDY MODEL

This study focused on individual returns, specifically (Pt–Pt-1)/Pt-1. Due to its ease of access, closing price data was used to analyze stocks. The volatility spillover factor in the movement of shares in the Energy sector on the IDX was examined. Furthermore, the study used Panel Data Regression analysis, with the variables described using statistical software. The description of the econometric model is;

$$Return\ stock = \beta_0 + \beta 1 WTIPrices - \beta_2 Inflasi - \beta_3 Kurs + \beta_4 RillGDP + \beta_5 ROE - \beta_6 FirmSize - \beta_7 DER + \varepsilon$$

Before the Panel Data Regression test, the classical assumptions were tested, including the Normality, Heteroscedasticity, and Autocorrelation Tests.

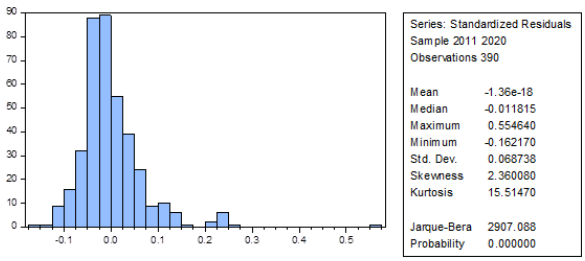
ANALYSIS AND RESULTS

Classic Assumption Test

According to (Gujarati, 2012), the classical assumption test was run to ensure that the study results were valid. The data used in theory should be unbiased, consistent, and efficient with the regression coefficient estimation. From this description, the classical assumptions used in this study were Multicollinearity and Heteroscedasticity Tests.

Normality test

In linear regression, normality assumes that the residual is not a variable. A normal distributed residual assumption is fulfilled if the probability value > and the J.B. value < the Chi-Square table value.



Based on the residual normality test output, the Jarque-Bera value is 2907.008 with a probability of 0.000 <0.05. Therefore, the residual data is not normally distributed, and the classical assumption of the normality test is not fulfilled. In essence, the normality test is not a BLUE (Best Linear Unbias Estimator) requirement in the common effects model. The prerequisite test on the common effect panel regression model only requires multicollinearity and heteroscedasticity as the necessary assumptions.

Multicollinearity Test

Multicollinearity is the existence of a perfect linear relationship between some or all of the independent variables in the regression model (Gujarati, 2012). It assesses whether there is a correlation between independent variables. There is no multicollinearity if the correlation value between independent variables is less than 0.8

Table 2. Multicollinearity Test

	WTI Prices	Inflation	Currency Exchange	Rill GDP Growth	ROE	*Firm Size*	DER
WTI Prices	1.000000	-0.292654	-0.044932	0.209887	0.102515	0.030806	-0.037397
Inflation	-0.292654	1.000000	-0.249368	0.395818	-0.028490	-0.071039	-0.004876
Currency Exchange	-0.044932	-0.249368	1.000000	-0.395401	0.026265	0.043685	0.008064
Rill GDP *Growth*	0.209887	0.395818	-0.395401	1.000000	0.005044	-0.094612	0.008504
ROE	0.102515	-0.028490	0.026265	0.005044	1.000000	-0.008184	-0.389106
Firm Size	0.030806	-0.071039	0.043685	-0.094612	-0.008184	1.000000	-0.021295
DER	-0.037397	-0.004876	0.008064	0.008504	-0.389106	-0.021295	1.000000

Source: Eviews 9.0 Output Results, processed secondary data

Based on the test output, the correlation value between the independent variables is less than 0.8, with the value between the 2 variables ranging from -0.95401 to 0.395818. This means that the assumption of no multicollinearity was met.

Heteroscedasticity Test

The presence or absence of heteroscedasticity in the data can be determined using the *Breusch-Pagan-Godfrey* Test, which proposes a regression of the independent variable to the residual squared value. In case the independent variable statistically affects the dependent one, there is heteroscedasticity (Ghazali, 2017). Heteroscedasticity occurs where the probability value is < 0.05.

Table 3 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.133590	Prob. F(7,382)	0.3410
Obs*R-squared	7.936447	Prob. Chi-Square(7)	0.3382
Scaled explained SS	55.2588 5	Prob. Chi-Square(7)	0.0000

Source: Eviews 9.0 Output Results, processed secondary data

Based on the output of the *heteroscedasticity* assumption using the *Breusch-Pagan-Godfrey* Test, which regresses the independent variable into the dependent one (absolute residual), all variables have a probability value greater than 0.05, with the Sig value being 0.3382, hence no *heteroscedasticity*.

Panel Data Model Selection

The hypotheses in this study were tested with the Panel Data Regression analysis model, which obtains a comprehensive view of the volatility spillovers between the dependent variable (stock returns) and the independent ones, specifically WTI, Inflation, Currency Rate, Real GDP Growth, ROE, Firm Size, and DER. The Panel Data Regression model was selected at the panel data stage, specifically the Pooled Least Square (PLS) and the Fixed Effect (FEM) models. From the results of the Chow test, the following results were obtained:

Table 4 Estimation Results of Common Effect vs. Fixed Effect Model Selection

Method	Chi-square probability	Decision	Description
Chow Test	0.7242	Ho accepted	*Common Effect*

Source: Eviews 9.0 Output Results, processed secondary data

Testing was conducted using Chow-Test with the following hypotheses:

H_0 (accepted if the value of Prob. Cross-section Chi-square > 0.05): Choose Common Effect

H_1 (accepted if the value of Prob. Cross-section Chi-square < 0.05): Select Fixed Effect

Based on the table above, the value of Prob is obtained. *Cross-section Chi-square* (0.7242) > 0.05 then with a 95% confidence level, H_0 is accepted. This means that the common effect model approach is better than the fixed effect for this study. Table 5 shows the results of the CEM model panel data regression analysis.

Table 5. Estimation Results of the Common Effect Method

Dependent Variable Stock returns		
Independent Variable	**Coefficient**	**Prob.**
C	*0.104790*	*0.0012*
WTI	*0.064364*	***0.0000******
INFLATION	*0.547394*	***0.0064******
CURRENCY EXCHANGE	*-6.07E-06*	***0.0052******
RILL GDP GROWTH	*-0.885259*	***0.0000******
ROE	*0.000245*	*0.7589*
FIRM SIZE	*-1.61E-08*	*0.5595*
DER	*-0.000230*	*0.1727*
R-squared	*0.090761*	
Adjusted R-squared	*0.074100*	
F-stat	*5.447381*	
Prob F-stat	*0.000006*	

Source: Eviews 9.0 Data Processing)

From the results of the *Common Effect Mode*l regression table, several things can be explained as follows:

The goodness of Fit Model

Based on the results of processing using the Common Effects method, the adjusted R-square value of 0.074100 or 7.41% means that all predictor variables in the model, including WTI Prices, Inflation, Currency Exchange, Real GDP Growth, ROE, Firm Size, and DER can explain the response variable of 9.08%, and the data value is very weak or limited. The rest (100% - 9.08% = 90.12%) is explained by other variables outside the model not studied.

Simultaneous Test (F Test)

Based on the common effect output, if the F-statistical probability value for the regression model is 0.000 < = 0.05 and the F statistic value (5,447) > F table (F(0.05,6/383) = 2,122), H_0 is rejected while H_1 is accepted. This means that the independent variables (WTI Prices, Inflation, Currency Exchange, Real GDP Growth, ROE, Firm Size, and DER) simultaneously and significantly affect the dependent variable, specifically Stock Return.

Hypothesis test

Based on the panel data model selection results, the appropriate model in this study was the *Common Effect Model* (CEM). The following is a partial test summary table.

Table 6. Partial Test Results

Variable	Coefficient	Prob.
C	0.104790	0.0012
WTI	0.064364	**0.0000***
INFLATION	0.547394	**0.0064***
Currency Exchange	-6.07E-06	**0.0052***
RILL GDP GROWTH	-0.885259	**0.0000***
ROE	0.000245	0.7589
FIRM SIZE	-1.61E-08	0.5595
DER	-0.000230	0.1727

*Significant at α=0.05
Source: Eviews 9.0 Data Processing)

After testing the *Common Effect mode*l, the equation formed as Panel Data Regression is as follows:

***Return* Stock = 0,104790 + 0,064364(WTI PRICES) + 0,547394(INFLASI) – 6,07E-06(KURS MATA UANG) – 0,885259(RIIL GDP GROWTH) + 0,000245(ROE) – 1,61E-08(*FIRM SIZE*) – 0,000230(DER)**

Based on the above equation, 7 independent variables were used in this study, and 4 are independent. WTI Prices, Inflation, Currency Exchange, Real GDP Growth, ROE, Firm Size, and DER variables can significantly affect the stock returns, and the large change in value received by the Stock Return variable is -0.168717 for every 1 change in value that occurs in the four independent variables. In total, the proportion of effect received by Y from all independent variables is -0.168702.

The Effect of WTI Prices to stock return

Prob value. If the WTI price is 0.0000 < 0.05 with a regression coefficient value of 0.0644, H0 is rejected, and H1 is accepted. This means that there is a significant positive (unidirectional) effect between WTI Prices and Stock Returns. This implies that the higher the WTI Price value, the higher the Stock Return value will be. Conversely, the lower the WTI Price value, the lower the value of Stock Return.

These results confirm the hypothesis that WTI prices positively affect Stock Returns in the IDX Energy sector. Similar to the theory in the previous explanation, world oil prices positively affect stock prices. Investors view

them as a sign of increasing global demand which improves economic conditions after the global crises. With such a rise, performance increases, similar to the firm expectations, which automatically increases stock prices, affecting profit (return).

The firms in the IDX Energy sector were most directly related to the world's crude oil commodities, including the production of coal, oil & gas, and their services. Sentiments from the increase or decrease in consumption of world crude oil commodities affected the firms' performance positively. The study results were similar to those conducted by (Fardiansyah et al., 2018; Komalasari, 2019; Pardede et al., 2016a; Rahmanto et al., 2016; Satyatama & Sumantyo, 2017).

The Effect of Inflation to stock return

Inflation is 0.0064 < 0.05 with a regression coefficient value of 0.5474, hence H0 is rejected, and H1 is accepted. This means there is a significant positive (unidirectional) effect between inflation and stock returns. The higher the inflation rate, the higher the stock return value. Conversely, the lower the inflation rate, the lower the stock return value.

These results confirm the hypothesis that inflation significantly affects the stock returns in the IDX Energy sector positively. For this reason, rising inflation can increase stock returns, hence firms can still record profits. Stock prices keep rising, a condition that significantly benefits investors. Furthermore, the inflation rate can affect people negatively or positively depending on its cause. In case the cause is the real sector, including productivity or unemployment, stock returns can be negatively affected. Suppose it is due to the monetary sector, including money supply, interest rates, and price levels, the effect on stock returns will likely be negative. This is in line with (Fardiansyah et al., 2018; Ismanidar, 2017; Pardede et al., 2016a).

The Effect of Exchange Rate to stock return

The currency exchange rate is 0.0052 < 0.05 with a regression coefficient of -0.607E-06. Hence H0 is rejected, and H1 is accepted. This means there is a significant negative effect (opposite direction) between Currency Exchange Rates and Stock Returns. Therefore, the lower the Currency Exchange rate, the higher the Stock Return value will be. Conversely, the higher the value of the Currency Exchange, the lower the Stock Return value.

These results confirm the hypothesis that the exchange rate negatively affects the stock returns in the IDX Energy sector. In general, the exchange rate follows the law of economic demand, where the higher the demand, the higher (stronger) the value (the exchange rate), and vice versa. The weakening of the rupiah currency affected the reaction of investors who held or withdrew their investment in the capital market because the dividends to be received were reduced, declining stock prices and returns. (A Nurwulandari et al., 2020) stated that exchange rate fluctuations reflect domestic economic conditions and become an indicator for investors. The weakening of the rupiah against foreign currencies negatively affected the economy and the capital market. Therefore, the domestic currency depreciation is a sign of a weakening country's economy and unpleasantly affects the capital market. Such a decline causes investors to sell their shares to prevent losses in the long term. Therefore, it affects price declines and stock returns. This is in line with (Agustin, 2016; Fardiansyah et al., 2018; Mouna & Anis, 2017; Pardede et al., 2016a).

The Effect of Real GDP Growth to stock return

Real GDP growth is 0.0000 < 0.05 with a regression coefficient value of -0.8853. Hence H0 is rejected, and H1 is accepted. This means that the significant effect is negative (opposite direction) for real GDP Growth against Stock Returns. This implies that the lower the Real GDP growth values, the higher the Stock Return value will be and vice versa; the higher the Real GDP growth value, the lower the Stock Return value.

These results confirm the hypothesis that Real GDP Growth significantly affects Stock returns in the IDX Energy sector in a

negative direction. It considers the current rate of inflation in a country. In measuring annual GDP, it is usually more accurate to describe the economic condition. Generally, a country's economy is good or healthy where the unemployment rate is low, and wages are increasing. This shows that the decline in the Real GDP values affects price increases and stock returns. Firms in the IDX Energy sector could still increase their productivity and performance to contribute to economic growth. Furthermore, the sector requires much workforce to offset the increase in production needs due to economic growth or slowdown. In case GDP growth is too fast, the central bank tends to increase interest rates to offset the inflation rate (the impact on increasing goods and services), negatively affecting stock returns and the stock exchange. The slowdown in economic growth does not directly harm the capital market. Moreover, the increase in productivity of the IDX Energy sector firms certainly affects performance, meaning that it can increase its share price. This is in line with what (Abbass et al., 2019).

The Effect of ROE to stock return

Prob value. ROE of 0.7589 > 0.05 with a regression coefficient value of 0.000245, hence, H0 is accepted. This means that ROE does not significantly affect Stock Return. This confirms the hypothesis that the ROE of the exchange rate positively affects stock returns in the energy sector on the IDX, but it is not statistically significant. They also explain that firms with good ROE attract investors to buy shares, especially in the IDX Energy sector. The energy sector firms with good profitability can perform well financially; hence, the stock price in the stock exchange increased and the stock returns. This confirms the underlying theory that an increase in a firm's profitability indicates that the firm's performance is getting better. However, the study results were not statistically significant because Indonesian investors tended to be more oriented towards capital gains than dividends. The study results are in line with (Musallam RM, 2018; Sugiarti, Surachman, 2015).

The Effect of Firm Size to stock return

Prob value. Firm size 0.5595 > 0.05 with a regression coefficient value of -1.61E-08, hence, H0 is accepted. This means that the Firm Size and Stock Returns do not significantly affect each other. This confirms the hypothesis that the Firm Size Exchange Rate negatively affects the Stock Return in the IDX energy sector, but it is not statistically significant. This sector's firms have different Firms sizes or Firm Sizes based on total assets. From the existing theory, large-scale firms tend to be more stable and have lower volatility than small-scale firms. Hence, this affects the stock price movements of the energy sector firms. However, investors view large-scale firms as mature and have limited growing space. Small-scale firms have expansion opportunities, which affects the changing stock price movements. This is in line with (Abbass et al., 2019; Ardiansyah & Isbanah, 2017; Izza & Wulandari, 2019).

The Effect of DER to stock return

Prob value. DER 0.1727 > 0.05 with a regression coefficient value of -0.00023, hence, H0 is accepted. This means that the DER and Stock returns did not significantly affect each other. This confirms the hypothesis that the exchange rate DER negatively affects the stock returns on the energy sector BEI, but it is not statistically significant. Theoretically explained, the size of debt borne by the firm affected the stock return size. The greater the firm's debt burden, the bigger the risk borne by the firm. From an investor's viewpoint, high corporate debts increase investment risk because most of the funds owed by the firm come from debt. Furthermore, conversely, a low debt ratio means less risk. The amount of debt also shows that the firm bears a burden in its operational activities, which becomes the investors' assessment. A too high DER can negatively affect the firm because of its dependence on debt. This, in turn, affects stock prices because investors naturally perceive firms that rely on debt as having a higher risk than the shares they buy. This is in line with (Abbass et al., 2019; Ardiansyah & Isbanah, 2017; Mehmood et al., 2019; Sugiarti, Surachman, 2015).

CONCLUSION

This study shows that the volatility of stock returns in the energy sector on the IDX was affected by economy-wide and market factors. The world crude oil price increases contribute positively to the volatility of stock returns in the energy sector because it directly relates to the firm's business activities. Furthermore, the market factor, especially inflation, has a positive effect, indicating that the energy sector firms can still make profits despite the inflation, while the currency exchange rate and real GDP growth negatively affect the capital market. The real GDP growth has a negative effect, meaning that its increase triggers the central bank to raise interest rates, negatively affecting the volatility of stock returns.

Firm-specific factors had no significant effect on the volatility of stock returns. Therefore, the energy sector firms are advised to continue paying attention to and strengthening their financial performance because the world economic shocks can affect their performance. The policy implications of this study urge the firms listed in the Energy sector to pay attention to the world global economic factors. Indonesia should continue contributing to economic growth, while investors need to serve as examples and analyze factors before investing in the stock sector energy.

Limitation And Suggestions

This study used only one economy-wide factor, specifically the World Oil Price. Future studies can add other factors, including market or other firm-specific factors, to examine their volatility on the Indonesian Stock Exchange. Moreover, this study examined volatility spillovers in the IDX Energy Sector. Future studies can regroup the sector to determine the volatility of the industry/firm sector on the Indonesian Stock Exchange.

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