



## Determinants of stock price volatility in Shariah-compliant firms

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### Abstract

This study examines how inflation, exchange rates, interest rates, earnings per share, debt-to-equity ratio, and dividend payout ratio impact the volatility of stock prices among companies listed on the Indonesia Stock Exchange between 2015 and 2018. The research focuses on companies included in both the Indonesian Sharia Stock Index (ISSI) and the broader Indonesia Stock Exchange (BEI) during this period. This research obtained a total of 680 samples with a purposive sampling method. This paper also uses regression data panel models by Eviews 9 software. The results of the test show that interest rates and earnings per share positively affect stock price volatility. Meanwhile, inflation and debt-to-equity ratio negatively affect stock price volatility. Apart from that, the exchange rate and DPR do not affect stock price volatility. The findings in this article can contribute to the existing literature related to stock price volatility and also provide benefits to policies for company stakeholders.

Keywords: Inflation; exchange rate; interest rates; debt to equity ratio, stock price volatility

### 1. Introduction

Volatility will cause uncertain risks to shareholders (Robiyanto *et al.*, 2017). Some shareholders focus more on stocks with high-quality volatility because the opportunity to get significant capital gains with the risks obtained is also immense.

Hartono (2017) stated that several factors affect the company's stock activities, including the level of dividends paid. Therefore, the dividends paid will be a concern for shareholders. In this regard, the value of the company's shares can be affected by the *risk level* of the stock in the long run (Robiyanto *et al.*, 2017). The dividends signal to shareholders that the company's management will hope for increased earnings in the future. Rising stock prices can result in benefits (Tyastari *et al.*, 2017). In addition to the effect of *dividend payout*, financial performance will impact stock price volatility (Gusni, 2017). Skinner and Soltes (2011) argue that shareholders prefer companies that can manage finances well.

On a stock exchange, fluctuations can be influenced by external and internal factors (Isnaini *et al.*, 2019). Factors that the stock exchange cannot control will come from outside and are called external factors. Macroeconomic variables, including the inflation rate, exchange rate, and B.I. rate, will be a reference for this study. On the other hand, internal factors related to policies and strategies implemented will also be used as a reference for this study, including the Dividend Payout Ratio (DPR), Debt to Equity Ratio (DER), and Earnings Per Share (EPS).

The development of the company's financial performance is an input that significantly impacts the investment decisions shareholders use. Some shareholders expect companies to have high liquidity, but shareholders are also selective in investing. The capital market is constantly adjusting to facilitate shareholders like this to accommodate all types of shareholders. One of them is the existence of a Sharia capital market that aligns with Sharia principles (Sari *et al.*, 2018).

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The Islamic financial system considers the Islamic capital market a pivotal element, despite its emergence as an end participant in the industry from the mid-1990s onwards. In particular, the sector is gaining positive momentum and is now attracting many shareholders and issuers worldwide (Sari *et al.*, 2018). The Indonesia Sharia Stock Index (ISSI) is a pillar of establishing the Islamic capital market in Indonesia. Islamic capital market operations resemble those of conventional capital markets, yet they adhere to Sharia principles through specific product and transactional mechanisms. The principles are based on Islamic teachings whose determination is used by DSN-MUI (Sari *et al.*, 2018).

Research on the determinants of stock price volatility in Indonesia has been widely conducted and produced different findings. Research by Romli *et al.* (2017), Akbar (2018), Christian and Frecky (2019) prove that inflation, exchange rates, B.I. *rate*, EPS, DER, DPR affect stock price volatility. The results of different studies were found by Raharjo and Muid (2013), Ilmiyono (2017), Handayani *et al.* (2018), that there is no effect of inflation, exchange rates, B.I. *rate*, DPR, DER, EPS on stock price volatility.

Inconsistencies in previous studies prompted researchers to retest. The variables are classified into external factors (Inflation, exchange rate, B.I. *rate*) and internal factors (EPS, DER, DPR). Retesting the determinants of stock price volatility is expected to be more relevant and can answer the inconsistencies of previous researchers. The companies and years studied are listed on ISSI in 2015, 2016, 2017, and 2018.

The reason this study took a group of companies listed on the Indonesian Sharia Stock Index (ISSI) is that it is an indicator of the performance of the Islamic stock market listed on the IDX and included in the Sharia Securities List (DES) issued by the Financial Services Authority (OJK). In addition, this study focuses on specific sectors and several sectors and subsectors expected to dominate and significantly contribute to this research. The advantage of this study lies in the combination of independent variables because it is still rarely used by previous researchers.

## **2. Theory review and hypothesis development**

### ***Portfolio theory***

The theory of portfolios operates under the assumption that it's possible to forecast future security returns and uses the distribution's fluctuations to gauge risk (Hartono, 2017). This theory establishes a linear relationship between risk and return. Portfolio construction involves assessing shareholders' risk perceptions and anticipated returns, employing statistical measures to shape their investment portfolios (Robiyanto, 2018).

Portfolio theory assumes that a shareholder wants a high return by looking at the portfolio's results. Related to this, companies with stock price movements that lead to positive increases will attract stock owners. Therefore, shareholders are interested in investing funds in companies with stock price movements that lead to positive increases because of the desire to obtain maximum results with minimal risk (Handayani *et al.*, 2018).

### ***Signaling theory***

Signal theory focuses on the importance of company information regarding outside decisions (Loeis dan Prijadi, 2015). Shareholders and business people need information from a company because it contains all conditions and records that indicate the current survival of a company the past, and future estimates (Handayani *et al.*, 2018). Information accuracy, completeness, and relevance are needed in analyzing various investment decisions.

According to Hartono (2017), stocks with positive signals are expected to receive positive feedback from the market when shareholders receive the announcement. The market will give *feedback* on the information published by the company. The information is interpreted and assessed, categorized as either positive or negative signals. Both categories of signals are anticipated to influence fluctuations in companies' stock trading volumes, subsequently leading to either an increase or decrease in stock prices (Handayani *et al.*, 2018).

### ***Stock price volatility***

Volatility represents the statistical evaluation of price changes in commodities within a specified timeframe (Robiyanto *et al.*, 2017). Market volatility poses a risk as it can be quantified

through standard deviation assessment techniques. Shareholders will not apply significant risks except for large risks, and there is an opportunity to obtain significant benefits. The situation can be said to be the term high-risk high return (Hartono, 2017).

### ***Hypothesis development***

With inflation as a macroeconomic variable, companies will be advantaged or disadvantaged. According to Hugida (2011), Capital market participants do not like the high inflation value because it will affect high production costs. In addition, the impact obtained is the increase in prices of domestic goods, which affects the company's ability (Hugida, 2011). Rising inflation leads to more selective economic policies and adversely affects stock prices. This adverse impact encourages shareholders to sell their shares, affecting stock price movements (Hugida, 2011). In this regard, inflation is considered a risk by shareholders. Rising inflation makes shareholders hold their shares, resulting in low stock price volatility.

Romli *et al.* (2017) argue that inflation affects stock price volatility. Inconsistencies discovered by Ilmiyono (2017) found no effect of inflation on stock price volatility. Based on this description, the hypothesis of this study is as follows:

H1: Inflation negatively affects stock price volatility.

Foreign exchange rates are numbers comparing the value of a currency with other currencies used as a medium of exchange for each country to trade between countries (Romli *et al.*, 2017). Inflation will impact the increase in commodity prices in the *real sector*, reducing the number of domestic deposits. Therefore, people's purchasing power will decrease, and shareholders will likely withdraw funds to meet their needs. The stock price will fall if there is a decrease in investment in the capital market (Anggarwal, 2017; Mgammal, 2012). In this regard, the exchange rate is considered a risk by shareholders. When the exchange rate rises, the step taken by the shareholder is to sell his shares so as not to get a significant loss. The sale of these shares will trigger an increase in stock price volatility.

Ilmiyono (2017) found no effect of exchange rates on stock price volatility. The results of different studies were used by Romli *et al.* (2017), and Akbar (2018), which found the influence of exchange rates on stock price volatility. Based on this description, the hypothesis of this study is as follows:

H2: Exchange rates have a positive effect on stock price volatility.

The interest rate is considered a risk by the shareholder. When interest rates rise, the step shareholders take is to sell their shares. Elevated interest rates might prompt investors to transition from stocks to deposits or alternative instruments. This shift occurs because deposits pose lower risks compared to stocks during periods of high interest rates. Selling these shares can induce fluctuations in stock prices. Reduced investment interest in stocks has the potential to impact stock prices. Consequently, a decline in stock demand can lead to a decrease in stock prices (Akbar, 2018).

Romli *et al.* (2017) found the effect of the B.I. rate on stock price volatility. Despite this, the research used by Ilmiyono (2017) did not find any effect of interest rates on stock price volatility. Based on this description, the hypothesis of this study is as follows:

H3: The B.I. *rate* has a positive effect on stock price volatility.

According to Raharjo and Muid (2013), EPS compares net profit after tax in one financial year with the number of shares issued. Large EPS will mark the company's ability to generate large profits. Shareholders are more interested in high EPS because EPS shows the profit shareholders are entitled to get on one share they own. Following signal theory, if EPS is high, it will provide good information for stock owners and be a positive input in stock buying decisions. The impact of low risk will make the demand for stocks rise so that the price will also rise. This description aligns with the results of Christian and Frecky (2019), which found an influence of EPS on stock price volatility. However, the results of Raharjo and Muid (2013) found no effect of EPS on stock price volatility. Based on the difference in results, this study hypothesizes:

H4: EPS has a positive effect on stock price volatility.

DER is a metric used to gauge how much leverage a company has on its equity, indicating the extent to which the company's assets are financed by debt. A greater DER indicates a larger portion of the company's assets funded by borrowed money. Regarding the ability to pay long-term obligations, the low DER ratio shows the company's ability to pay long-term obligations (Raharjo and Muid, 2013). Investing in a company is considered low risk if the company has a low DER ratio and is considered high risk if the value of the DER ratio is high.

Research results of Handayani *et al.* (2018) indicate DER's influence on stock price volatility. Instead, the research used Raharjo and Muid (2013) and Ilmiyono (2017), which do not show DER's effect on stock price volatility. Based on the description above, the hypothesis of this study is as follows: H5: DER has a negative effect on stock price volatility.

Stockholders or shareholders who buy shares will get dividends from the company by looking at the net income percentage or the Dividend Payout Ratio (DPR) (Brigham and Houston, 2007). This opinion aligns with portfolio theory, which states that a shareholder wants a high return by looking at the portfolio's results. Therefore, the amount of the company's contribution to pay dividends illustrates the size of the ratio. The company can be said to be at risk if the company does not distribute dividends because the company experiences a net loss or to expand the business. However, Handayani *et al.* (2018) found the effect on stock price volatility. Based on the description above, the hypothesis of this study is as follows:

H6: DPR has a positive effect on stock price volatility.

### 3. Method

The unit of analysis used in this study is all companies in the Indonesian Sharia Stock Index (ISSI) listed on the IDX for the period 2015-2018. The study was conducted from February 2020 to June 2020. This study used companies that entered ISSI on the IDX as a population. This study used *purposive sampling* to collect research data samples with sample criteria in this study:

- ISSI companies *have been listed on the IDX since December 30, 2014*, and did not *delist* during the research period.
- Companies must have at least one *dividend payout* from 2015 to 2018.
- Companies that include stock price data from 2015 to 2018.
- The company includes annual reports and financial statements audited by independent auditors.

The researcher intends to examine the impact of fundamental aspects proxied to EPS, DER, and DPR and the economic conditions of inflation, exchange rates, and B.I. rates on stock price volatility. Therefore, the independent variables in this study are EPS, DER, and DPR, whereas the dependent variable is stock price volatility. Each variable used will be described in Table 1.

The research data analysis employs a multifaceted approach, employing various sophisticated methodologies to derive meaningful insights. One of the key techniques employed is the best model selection test, which involves scrutinizing and evaluating different models to identify the most suitable one for the research context. Classical assumption tests are also conducted to ensure that the underlying assumptions of the chosen models are met, thereby enhancing the robustness of the analysis. The multiple regression method, specifically tailored for panel data, is a cornerstone of the analytical framework. This technique is adept at handling datasets with both time-series and cross-sectional dimensions, providing a comprehensive understanding of the relationships between variables. Additionally, the analysis incorporates panel data regression and hypothesis tests to validate the research findings rigorously. The entire analytical process is facilitated through the utilization of EViews 9 software, a powerful tool for econometric analysis.

Within the realm of multiple regression analysis for research employing panel data, the study explores three widely recognized models (Ghozali, 2017). The Common Effects Model is one of these models, emphasizing the shared or common factors influencing the variables across different entities in the panel. The Fixed Effects Model, often implemented through the Least Square Dummy Variables method, accounts for individual-specific effects by introducing dummy variables for each entity in the panel. This model is particularly useful in capturing unobserved heterogeneity among entities. Lastly, the Random Effects Model is another pivotal model considered in the analysis. This model assumes that the individual-specific effects are random, allowing for a more flexible and generalized approach to panel data regression. By examining these three models, the research aims to provide a nuanced

understanding of the relationships within the data, offering valuable insights that contribute to the broader body of knowledge in the field.

All three models must be tested to determine the best model for the panel regression equation. The Chow test is carried out to determine the best model between C.E. and F.E. The Hausman Test compares the best model between F.E. and RE models (Iqbal, 2015).

Table 1. Research variables and variable measurement indicators  
Determinants of stock price volatility

| Measured variables     | Indicator  | Source  |
|------------------------|--|---|
| Stock price volatility | $PV = \sqrt{\frac{1}{n} \sum \ln \left( \frac{Ht}{Lt} \right)^2}$          | (Hugida, 2011)  |
| Inflation              | $Inflation = \frac{\text{Current Price}}{\text{Based Price}} \times 100\%$ | Ilmiyono (2017) and Romli <i>et al.</i> (2017)                      |
| Exchange rate          | $\ln (Kurs \text{ Tengah})$  | Ilmiyono (2017)   |
| BI rate                | Average BI rate for one year   | Ilmiyono (2017)   |
| EPS                    | $\frac{\text{Revenue after tax}}{\text{Number of outstanding share}}$      | Raharjo and Muid (2013), Akbar (2018) and Christian & Frecky (2019) |
| DER                    | $\frac{\sum \text{Debt}}{\sum \text{Shareholder Equity}}$                  | Ilmiyono (2017), Handayani <i>et al.</i> (2018), and Akbar (2018)   |
| DPR                    | $\frac{\text{Dividend Per Share}}{\text{Earning Per Share}}$               | Handayani <i>et al.</i> (2018)                                      |

**Data regression panel analysis**

This study examined the effect of independent variables on dependent variables throughout more than one period and more than one sample member. The technique used in this observation is multiple regression analysis for panel data. Multiple regression analysis models can produce estimated values that use more than one independent variable (Algifari, 2016). In general, the panel data regression equation is as follows:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_k X_{kit} + \epsilon_{it} \dots (1)$$

Y: Dependent Variables

α: Constant

in: Entities number-i

T: T-th period

β 1. β<sub>2</sub>....β<sub>k</sub>: Regression coefficient X<sub>1it</sub>, X<sub>2it</sub>...., X<sub>kit</sub>

ε: Error

The relationship between all independent variables used to see their effect on the dependent variable is expressed through the regression model for this study as follows:

$$SPV_{it} = \alpha + \beta_1 INF_{it} + \beta_2 KURS_{it} + \beta_3 RATE_{it} + \beta_4 EPS_{it} + \beta_5 DER_{it} + \beta_6 DPR_{it} + \epsilon_{it} \dots (2)$$

α : Constant

SPV<sub>it</sub> : Stock price volatility

β<sub>1</sub>INF<sub>it</sub> : Inflation

β<sub>2</sub>EXCHANGE RATE : Exchange rate

β<sub>3</sub>RATE<sub>it</sub> : Interest rate

β<sub>4</sub>EPS<sub>it</sub> : Earnings Per Share

|                          |                         |
|--------------------------|-------------------------|
| $\beta_5\text{DER}_{it}$ | : Debt to Equity Ratio  |
| $\beta_7\text{DPR}_{it}$ | : Dividend Payout Ratio |
| $\varepsilon$            | : Standard error        |

#### 4. Results and discussion

Research on the determinants of stock price volatility is represented from all ISSI companies selected by DES and listed on the IDX 2015-2018. In 2019, 420 companies were selected by DES and listed on the IDX. However, companies that met the criteria for this study amounted to 170 companies, so this study used samples from 2015-2018 totaling 680 samples. Here is a diagram showing the distribution of research samples.

Table 2. Purposive Sampling Results

|  |       |
|--|-------|
| Companies registered with ISSI and selected by DES | 420   |
| Companies not listed since December 30, 2014       | (120) |
| Companies that do not pay dividends                | (130) |
| Companies sampled                                  | 170   |
| Years of observation                               | 4     |
| Total research data                                | 680   |

##### *Best model selection test*

##### *Chow test*

The Chow test is used to compare the C.E. (*Common Effects*) model with the F.E. (*Fixed Effects*) model so that it will be possible to determine which model is best to wear (Algifari, 2019). Before the Chow test was used, regression was carried out with C.E. and F.E. models. The results of the C.E. and F.E. models are shown in appendices 1 and 2.

Once regression is performed with C.E. and F.E. models, the two models can be compared with the Chow test. The decision criteria on the Chow test for this study are seen from the probability value. If the probability value is less than the significance level ( $\alpha$ ) 0.05, the decision rejects  $H_0$ .

The hypothesis in the Chow test is as follows:

$H_0$ : The estimation model has the same intercept (*Common Effects*)

$H_a$ : Estimation models have different intercepts (*Fixed Effects*)

Table 3. Chow test results

Redundant fixed effects tests and test cross section fixed effects

| Effects Test             | Statistic   | d.f.     | Prob.  |
|--------------------------|-------------|----------|--------|
| Cross-section F          | 1.548,185   | -169.504 | 0.0002 |
| Cross-section Chi-square | 284.335,317 | 169      | 0.0000 |

Table 3 displays the outcomes of the Chow test. Within this table, the probability value recorded for the Chow test, at 0.0002, falls below the designated alpha level. This outcome implies the rejection of  $H_0$ , indicating that the F.E. model was the preferable choice.

##### *Uji hausman*

The Chow test concludes that the F.E. model is a better estimation model than the C.E. in this study. F.E. models are consistent and have high *variance errors* or are inefficient. A good estimation model is a model whose *variance error* is not high and consistent (Algifari, 2019).

The results of the Chow test, the F.E. model, will be compared with the RE model. The RE model is efficient (*variance error*) and is not high but inconsistent. The RE estimation model accommodates differences in time and sample member characteristics through errors from the estimation model. Therefore, if the results of the Hausman test show that the RE model is better to use, then the RE model obtained is both consistent and efficient (Algifari, 2019).

The decision from the results of the Hausman test in this study looks at the resulting probability value. The probability value is less than the significance value used by 0.05, so the decision rejects  $H_0$ . The Hausman test hypothesis is as follows:  
 $H_0$ : the RE estimation model is consistent  
 $H_a$ : RE estimation model is inconsistent

Table 4. Hausman test results  
 Correlated random effects–Hausman test  
 Test cross-section random effects

| Test Summary         | Chi-Sq. Statistic | Chi-Sq. City. | Prob.  |
|----------------------|-------------------|---------------|--------|
| Cross-section random | 0,000000          | 6             | 1,0000 |

\*Cross-section test variance is invalid. Hausman statistic set to zero.

Table 5. Test cross-section random effects  
 Cross-section random effects test comparisons:

| Variable  | Fixed     | Random    | Var (Diff.) | Prob.  |
|-----------|-----------|-----------|-------------|--------|
| INFLATION | -0,005405 | -0,005541 | 0,000000    | 0,1100 |
| COURSE    | -0,048318 | -0,050483 | 0,000002    | 0,1341 |
| RATE      | 0,001095  | 0,001103  | 0,000000    | 0,2039 |
| EPS       | 0,000009  | 0,000005  | 0,000000    | 0,0087 |
| DER       | -0,000000 | -0,000000 | 0,000000    | 0,5524 |
| DPR       | -0,000009 | -0,000007 | 0,000000    | 0,6256 |

From Table 4 and Table 5, it can be concluded that the results of the Hausman test are invalid. The result is because one of the independent variables does not meet the requirements for RE. Therefore, if a study does not meet the requirements for RE, then the EViews program will reject the Hausman test (Anggraini, 2013). This description shows that the F.E. model is better than the R.E.

### ***Cross Section Weighted***

Sequential Chow and Hausman tests showed that the F.E. model had a better result. These results show that the F.E. estimation model is consistent. F.E. estimation models, including *Ordinary Least Square* (OLS), may still contain heteroscedasticity problems. Therefore, the model chosen for regression is a consistent but inefficient F.E. model (*high variance error*), or there is still a heteroscedasticity problem. So, to overcome the heteroscedasticity problem, it is necessary to use a weighting test (Algifari, 2019).

*Cross-section weighting* is used to produce F.E. models with weighting. After obtaining the F.E. model with weighting, a weighting test will be used to compare the F.E. model with weighting and the F.E. model without weighting.

Table 6. Weighted statistics  
 Cross-section fixed (dummy variables)

| Weighted Statistics |           |                     |           |
|---------------------|-----------|---------------------|-----------|
| R-squared           | 0,593433  | Mean dependent was  | 0,044224  |
| Adjusted R-squared  | 0,452264  | S.D. depended was   | 0,031096  |
| S.E. of regression  | 0,015833  | Sum squared resid   | 0,126349  |
| F-statistic         | 4.203,699 | Durbin-Watson State | 2.399,543 |
| Prob(F-statistic)   | 0,000000  |                     |           |

Table 7. Unweighted statistics

| Unweighted Statistics |          |                     |           |
|-----------------------|----------|---------------------|-----------|
| R-squared             | 0,355120 | Mean dependent was  | 0,025500  |
| Sum squared resid     | 0,131446 | Durbin-Watson State | 2.623,187 |

Table 6 and 7, shows a comparison of F.E. *Weighted* and *Unweighted* models. Which model is better can be seen from the R-squared value on each model. A larger R-squared will be chosen as the estimation model because it represents a more consistent estimation model. The F.E. weighted model has an R-squared of 0.59, more significant than the R-squared of the F.E. *unweighted* model of 0.35. The results of this comparison show that the F.E. weighted model is better to use so that the heteroscedasticity problem can be eliminated by *cross-section weighting*. F.E. weighted models to be consistent and efficient (*variance error* is not high) (Algifari, 2019).

### **Panel data regression analysis**

Three estimation models often used in multiple regression analysis for panel data have identified which model works best for this study—the Chow test and Hausman test- and resulted in the F.E. model being consistent to use. The F.E. model is consistent but still contains heteroscedasticity issues. Therefore, the F.E. model is carried out with cross-section weighting, where the results show that F.E. weighting is better used or that the heteroskedasticity problem in the regression model has been eliminated by cross-section weighting.

These stages have produced this study's best regression model, the F.E. weighted model. The F.E. weighted model has been free from the problems of multicollinearity and heteroscedasticity while providing results for multiple regression analysis on panel data. The F.E. weighted table will then be presented separately to analyze multiple regression and model precision tests.

Table 8. Multiple regression with F.E. weighted models

Dependent variable: SPV

Method: Panel EGLS (cross-section weighted)

Total panel data observations: 680

| Variable  | Coefficient | Std. Error | t-Statistic | Prob.  | Result           |
|-----------|-------------|------------|-------------|--------|------------------|
|           | 0,157654    | 0,094013   | 1.676,937   | 0,0942 | -                |
| INFLATION | -0,003216   | 0,001139   | -2.824,043  | 0,0049 | H1 Supported     |
| KURS      | -0,013587   | 0,009684   | -1.403,043  | 0,1612 | H2 Not Supported |
| RATE      | 0,001233    | 0,000271   | 4.547,833   | 0,0000 | H3 Supported     |
| EPS       | 6.17E-06    | 1.70E-06   | 3.633,054   | 0,0003 | H4 Supported     |
| DER       | -3.72E-08   | 1.39E-08   | -2.675,080  | 0,0077 | H5 Supported     |
| DPR       | -6.66E-06   | 3.63E-06   | -1.838,334  | 0,0666 | H6 Not Supported |

This study aims to determine the influence of independent variables, namely inflation, exchange rates, interest rates, EPS, DER, and DPR, on stock price volatility. Multiple regression analysis techniques are used because their independent variable exceeds one variable. From Table 8, the regression equation of panel data with the F.E. *Weighted* model is obtained as follows:

$$SPV_{it} = (0,157654 + \alpha) - 0,003216INF_{it} - 0,013587KURS_{it} + 0,001233RATE_{it} + 6,17E-06EPS_{it} - 3,72E-08DER_{it} - 6,66E-06DPR_{it} \dots(3)$$

Table 8 shows that the probability value associated with the inflation variable is below the significance threshold of 0.05. These findings suggest that inflation has a notable and adverse impact on stock price volatility. Inflation has a negative effect indicated by a negative coefficient value. The statement supports the H1 proposed by the researcher. These results support the research of Romli *et al.* (2017), which shows that inflation affects stock price volatility. Rising inflation leads to more selective economic policies and adversely affects stock prices. This adverse impact encourages shareholders to sell their shares, affecting stock price movements (Hugida, 2011).

The exchange rate variable (KURS) has a probability value of 0.1612. It means that the exchange rate variable does not affect stock price volatility. Therefore, these results do not support the H2 proposed by the researchers. Ilmiyono (2017) research supports this research, which examines the



influence of financial performance and macroeconomic factors in predicting stock price volatility. As a result, Ilmiyono (2017) research did not find any influence of the exchange rate on stock price volatility.

The exchange rate is a country's currency expressed in another country's currency. In this case, an increased exchange rate is called domestic currency depreciation in foreign currencies. Changes in the value of the currency will indirectly have an impact on the price of shares sold. The impact is associated with signals for stock owners to sell or buy shares. Even so, currency changes do not always attract shareholders' attention due to shareholders' vigilance in making decisions (Azura *et al.*, 2018). This condition shows that exchange rate variables do not affect stock price volatility. Different things happen to variable interest rates (RATE) with a probability value of 0.0000, smaller than the significance level of 0.05. This value indicates that variable interest rates affect stock price volatility.

The variable interest rate (RATE), after being tested with the F.E. *weighted* model, partially gives a probability value of 0.0000, which is far below the significance level of 0.05 with a positive coefficient of 0.0012 so that it can be concluded that the interest rate has a positive and significant effect on stock price volatility. A positive coefficient value indicates the existence of interest rates with a positive effect. The statement support the H3 proposed by the researcher.

This research is supported by Romli *et al.* (2017), which also found that interest rates affect stock price volatility. The existence of high interest rates encourages shareholders to sell their shares. This will trigger volatility in stock prices. A decrease in investment interest in stocks can affect stock prices. Therefore, stock prices will fall when the share demand decreases (Akbar, 2018). Vice versa, if what happens is the low-interest rate of stock *returns* obtained by stock owners rises.

On the other hand, the EPS independent variable also has a probability value of 0.0003, smaller than the significance level of 0.05. This condition indicates that the EPS variable affects stock price volatility. Therefore, the H4 proposed by the researcher is supported. Following signal theory, if EPS is high, it will provide good information for stock owners and be a positive input in stock buying decisions. This condition will increase share demand, so the price will also rise. The source of this description is supported by the results of research from Akbar (2018) and Christian and Frecky (2019), which found the influence of EPS on stock price volatility. However, research from Raharjo and Muid (2013) found no effect of EPS on stock price volatility.

The same thing also happens to the DER variable, which affects stock price volatility. A probability value below the significance level of 0.05 and a negative resulting coefficient indicate that DER negatively affects stock price volatility. Based on this statement, the H5 submitted by the researcher is supported. A high DER indicates that a significant portion of a company's assets are funded through debt. Elevated debt levels can escalate company expenses, potentially leading to a decline in profits (Akbar, 2018). Consequently, a high DER value might signal poor company performance, diminishing shareholder interest in stocks and subsequently lowering stock prices.

However, DPR does not affect stock price volatility because the probability value of DPR of 0.0666 is greater than the significance level of 0.05. Therefore, these results do not support the H6 proposed by the researchers. This can be seen from the data that not all companies distribute dividends yearly. From the data obtained, only 16 companies consistently distributed dividends from 2015-2018. Therefore, shareholders do not need to be encouraged by the dividends distributed because not all dividend distribution companies affect stock price volatility (Retno and Permatasari, 2016).

## 5. Conclusion

This study examines the effect of inflation, exchange rates, interest rates, EPS, DER, and DPR on stock price volatility. The method used was regression analysis of multiple panel data for the observation period from 2015 to 2018 with 680 samples. Data characteristics show that the data is classified as panel data, with the best model selected being *Fixed Effects Weighted*. The result shows several conclusions. Inflation and DER negatively affect stock price volatility in ISSI for the 2015-2018 period. Exchange rates and DPR do not affect stock price volatility in ISSI for the 2015-2018 period. Interest rates and EPS positively affect stock price volatility in ISSI for the 2015-2018 period.

This study has limitations on the R-square coefficient of determination generated through the F.E. *Weighted* model. The R-square produced in this study was 0.5934. It indicates that inflation, exchange rates, interest rates, EPS, DER, and DPR variables can only determine stock price volatility

by 59.34%. So, there is still a possibility for other independent variables outside this study that can affect stock price volatility. In addition, this study only used the period 2015-2018.

Anticipating future advancements in research, there is a recognized need for the incorporation of additional independent variables that were not considered in the current study. The inclusion of variables such as trading volume, trading frequency, Current Ratio, and Dividend Yield is suggested to provide a more comprehensive understanding of the factors influencing stock price volatility. Trading volume and frequency, for instance, could offer insights into market activity and investor sentiment, contributing valuable dimensions to the analysis. Current Ratio and Dividend Yield, on the other hand, may shed light on the financial health and dividend-paying capacity of the companies under investigation. By integrating these variables, future research endeavors aspire to enhance the explanatory power of models, capturing a broader spectrum of influences on stock price volatility. This expansion of the independent variable set is envisioned to refine the predictive capacity of the models and contribute to a more nuanced comprehension of the dynamics in financial markets.

In addition to broadening the array of independent variables, future research is encouraged to extend the temporal scope of investigation by increasing the number of research periods. This extension is proposed as a means to bolster the reliability and robustness of the results obtained. A more extensive time horizon allows for the identification of potential trends, patterns, or anomalies that may not be discernible within a limited timeframe. Moreover, an increased number of research periods provides a more comprehensive perspective on the dynamics of stock price volatility, accommodating variations that may occur over different market conditions or economic cycles. By adopting a longitudinal approach, future studies can better capture the evolution of relationships between variables, offering a more nuanced and contextually relevant analysis of stock price volatility over time.

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