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Article

# Global or Domestic Factors? Assessing Stock Market Volatility during Indonesian Presidential Elections

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## Abstract

This study analyzes four Indonesian presidential elections (2009-2024) as a time series analysis within the event study framework on IHSG volatility. We examine the influence of macroeconomic, trading activity, and VIX channels, as well as whether their impact differs between pre-election and post-election periods. The methodology employs Principal Component Analysis (PCA) to construct channel variables and multiple linear regression with interaction terms on a baseline 5-month window before and after election month. The results consistently show that global risk sentiment (VIX) is the only significant positive driver of volatility. There is no significant interaction effects were found in either the 5-month, indicating that the influence of these channels is not statistically different between the pre-election and post-election periods. We conclude that Indonesian stock market volatility around presidential elections is predominantly driven by global risk sentiment, which overshadows domestic political transitions and associated local market dynamics.

**Keywords:** indonesian stock market; stock market volatility; presidential elections; vix

## 1. Introduction

Political events, especially the presidential election, one of major source of uncertainty in financial markets, as they change policy expectations, redistribute political power, and reshape investor sentiment towards future economic conditions. The presidential election as one of the most anticipated political events as a source of uncertainty that can trigger volatility in the stock market. Stock market volatility defined as fluctuations in stock returns, it is an important measure of uncertainty in investment management (Gupta, 2024). Understanding volatility is essential for portfolio management, risk assessment, and derivatives pricing. In the capital market, political dynamics are an inevitable factor that influences investor behavior (Qin Jing et al., 2023). Empirical evidence from international market confirms this relationship, studies in the United States (Mnasri & Essaddam, 2021) and some developing countries in Africa show increased market volatility during election periods (Godwin Musah; Daniel Domeher; Abubakar Musah, 2023). Volatility in emerging markets tends to be higher due to investors' greater sensitivity to political decisions and macroeconomic instability (Tabash et al., 2024). This issue is particularly relevant for emerging markets such as Indonesia, where the stock market exhibits unique characteristics and a higher sensitivity to political and macroeconomic changes.

This study focuses on the Indonesian Composite Index (IHSG) to investigate how election-related uncertainty transmits through three variables. First, the macroeconomic channel variable represented by interest rates, inflation, and exchange rates, captures how political uncertainty affects asset valuations through changes in fundamental economic conditions. Second, the trading activity channel variable including trading volume, transaction frequency, and traded value reflects how investors' heterogeneous reactions and liquidity shifts affect price volatility. For the last one, the global sentiment channel variable proxied by the implied volatility index (VIX), measures cross border of global risk perceptions that can intensify domestic market reactions to political events.

Previous literature has demonstrated that changes in macroeconomic conditions significantly influence financial-market volatility, shaping both risk assessment and portfolio diversification strategies (Zaimovic & Omanovic, 2021). Prior research confirm that macroeconomic variables such as exchange rate, inflation, and interest rate strongly affect stock volatility (Pole & Cavusoglu, 2021). Moreover, a long-standing body of research (Valadkhani & O'Mahony, 2025) highlights a positive correlation between trading volume and stock volatility, while trading frequency also contributes to volatility formation (Xue & Gençay, 2012) and research by (Eisler & Kertész, 2007) examined the dynamics of trading value and found that trading value is directly proportional to volatility.

The implied volatility index (VIX) constructed from S&P 500 option prices serves as a key indicator of market uncertainty and investor fear (Goodell & Vähämaa, 2013). Despite its widespread use in global markets, the VIX index has not been widely explored in the Indonesian stock market, especially in relation to volatility triggered by general elections. Research conducted by (Kirci et al., 2024) found that there is a strong relationship between the VIX index and emerging stock markets, including Indonesia, where increased global uncertainty increases domestic market volatility. However, it does not discuss the VIX in relation to the presidential election period. This gap highlights the need for research that integrates domestic macroeconomic and trading factors with international sentiment indicators.

Our contributions are address these research gaps, this paper examines the impact of newest four Indonesian presidential election cycles (2009, 2014, 2019, and 2024) on IHSG volatility using a multi-channel framework. Specifically, it analyzes three sets of variables, first one is macroeconomic indicators (interest rate, inflation, exchange rate). Second one, trading activity indicators (trading volume, transaction frequency, traded value), and the last one global risk sentiment (VIX). Principal Component Analysis (PCA) is applied to construct composite variables, and multiple linear regression is used to test hypotheses.

## 2. Materials and Methods

Analyzing stock market volatility during a political transition requires methods capable of capturing uncertainty, information transmission, and structural changes in investor behavior. Elections are widely recognized as major political events that increase uncertainty and alter market expectations (Mnasri & Essaddam, 2021). To capture political events, this study uses event study as the methodology. The Event Study was first introduced by Dolley in 1933 in his research relating to stock splits. Over time, this concept has undergone significant development through the contributions of several well-known researchers in the field of finance such as Ball and Brown, Beaver, and Fama, each of which provides a new approach to understanding how the market reacts to certain information or events. Through these various studies, event studies then became one of the analysis approaches that are quite popular in financial research. According to (Peterson, 1989), the main purpose of event study is to calculate and evaluate the market reaction that arises due to a certain event, both internal such as profit announcements and external ones such as government policy announcements or political turmoil. The event study in this study used 5 months before the election and 5 months after the election, in accordance with the one used in (Zanon & Dantas, 2020) which tested the period before and after to test the significance of changes in market behavior. This aims to provide a complete picture of whether the market has anticipated the existing information or even reacted after the event occurred.

The data in this study is secondary and obtained from official sources that can be accessed by the public. The data used is monthly data, consisting of 40 observation data consisting of four cycles of the Indonesian Presidential Election (2009, 2014, 2019, 2024) each cycle consisting of 5 months before and after. The researcher included 40 observational data, referring to (Id & Quintana-ascencio, 2020) which said the minimum regression sample for high variance was  $N=25$  and was almost the same as the observation data conducted by (Goodell & Vähämaa, 2013) with  $N= 39$ . Monthly data was chosen because it adjusts the availability of macroeconomic data and trading activity data in monthly form. More so, Monthly data is also selected in volatility research in other countries, the

study was conducted by (Valadkhani & O'Mahony, 2025). The Indonesia Composite Index (IHSG) and trading activity indicators, which include trading volume, transaction frequency, and transaction value, are obtained from the Indonesia Stock Exchange (IDX). Macroeconomic data consists of interest rates (BI Rate) obtained from Bank Indonesia, as well as inflation sourced from the Central Statistics Agency (BPS). Meanwhile, the rupiah exchange rate against the US dollar is obtained from the Ministry of Trade of the Republic of Indonesia. To capture global risk sentiment, the study uses the CBOE Volatility Index (VIX) as a proxy for global volatility.

Stock market volatility is measured using the monthly realized volatility of the IHSG index. The volatility of IHSG is variable dependent. The methodology used in calculating volatility is the monthly realized volatility referred to (Schwert et al., 1989), which estimates volatility as the standard monthly deviation derived from the daily yield. The use of standard deviation was chosen because it is considered more robust than the variance specification in capturing market fluctuations. After that, there are three independent variables used: a macroeconomic channel that combines interest rates, inflation, and exchange rates, which jointly capture monetary stance, price stability, and external competitiveness. In this macroeconomic channel, interest rates use the monthly interest rate indicator, then inflation uses the monthly inflation percentage, and the exchange rate uses the monthly rupiah exchange rate against the US dollar. For the trading activity channel combining trading volume calculated in the number of shares traded monthly, the frequency of trades is measured using the number of monthly traded transactions, and the value of trades is calculated through the number of shares traded multiplied by the market price in the month. Lastly, the VIX is taken from the monthly average value of the VIX itself.

Before the analysis, all independent variables such as interest rates, inflation, exchange rates, trading volume, transaction value, transaction frequency, and VIX were first standardized using the Z-Score method. Standardization also helps to improve the accuracy of the model's calculation results and interpretation. This step is done to equalize the scale between variables, so that each has a comparable unit before being incorporated into the PCA and regression analysis. The next stage is to conduct a Principal Component Analysis (PCA) on two groups of variables, namely the Macroeconomic Channel and the Trade Activity Channel. This method is used to reduce the dimension and combine several indicators that have a high correlation into one main component, namely Macroeconomic for the variables of interest rates, inflation, exchange rates, and Trading\_Activity for the variables of trade volume, transaction value, and transaction frequency. The results of this extraction are then used as new variables that represent the main characteristics of each channel more efficiently and free from the potential for multicollinearity or autocorrelation. The combination of Z-Score and PCA methods has also been carried out in financial research by (Thalassinos et al., 2025) and (Aldasoro et al., 2025).

The main analysis of this study uses multiple linear regression, following prior studies on (Goodell & Vähämaa, 2013). This study employs a multiple linear regression framework to examine the partial effects of domestic macroeconomic conditions, market trading behavior, and global risk sentiment on IHSG volatility during presidential election periods. The empirical model is specified as follows:

$$Y_t = \beta_0 + \beta_1 \text{Macroeconomic}_t + \beta_2 \text{Trading\_Activity}_t + \beta_3 \text{VIX}_t + \beta_4 \text{Dt} + \beta_5 (\text{Dt} \times \text{Macroeconomic}_t) + \beta_6 (\text{Dt} \times \text{Trading\_Activity}_t) + \beta_7 (\text{Dt} \times \text{VIX}_t) + \epsilon_t$$

The description of the empirical model is as follows:

$Y_t$  = IHSG volatility in the month  $t$ .  $\text{Macroeconomic}_t$  = The key component score (PCA) representing the Macroeconomic Channel (the sum of interest rates, inflation, and exchange rates) in the  $t$ -period.  $\text{Trading\_Activity}_t$  = The key component score (PCA) representing the Channel of Trade Activity (the sum of volume, value, and frequency of transactions) in the  $t$ -period.  $\text{VIX}_t$  = the Z-score value of the Volatility Index (VIX) in the  $t$ -period, which represents the Global Uncertainty Channel.  $\text{Dt}$  = Dummy Variable Period in month  $t$  (0 = before the election; 1 = after the election).

(Dt×Macroeconomict), (Dt×Trading\_Activityt), (Dt×VIXt) = Interaction Variable between the time dummy and the independent variable.  $\epsilon_t$  = Error term in month t

Coefficient Interpretation:

$\beta_0$ : Intercept, represents the volatility of IHSG when all independent and dummy variables are zero.  $\beta_1, \beta_2, \beta_3$ : Regression coefficients for Macroeconomic, Trading\_Activity, and VIX. Each measures the magnitude of the influence of each channel on IHSG volatility in the period before the election (when D=0).  $\beta_4$ : Dummy coefficient, showing the difference in the average volatility of IHSG in the period after the election compared to the period before the election, assuming the independent variable is zero. In the presence of interactions,  $\beta_4$  measures changes in the intercept.  $\beta_5, \beta_6, \beta_7$ : Regression coefficients for interaction variables. These coefficients are the main focus for testing your hypothesis. Each measures the change in the slope of each channel (Macroeconomic, Trading\_Activity, VIX) on the volatility of the IHSG in the post-election period compared to the pre-election period.

The interpretation of this interaction coefficient is important to see how the influence of variables changes between periods. For the period before the election (D=0), the Macroeconomic influence on the volatility of the IHSG is represented by  $\beta_1$ , while in the period after the election (D=1) the effect is  $(\beta_1 + \beta_5)$ . Thus,  $\beta_5$  reflects changes in the influence of macroeconomic factors after political events occur. The same applies to Trading\_Activity, where the effect in the period before the election is indicated by  $\beta_2$ , and after the election becomes  $(\beta_2 + \beta_6)$ . The regression model with dummy interactions allowed researchers to test the direct influence of each channel on IHSG volatility and identify whether there was a significant difference in the strength or direction of the influence between the period before and after the election. This directly supports testing research hypotheses that focus on impact changes over time.

### 3. Results

The descriptive statistics in Table 1 reveal that all variables show adequate variability and are considered suitable for utilization in the next regression analysis which aims to examine the relative impact of domestic and global factors on IHSG volatility. The descriptive variable statistics used in the analysis include IHSG volatility, the score of the main components of the PCA results for macroeconomic channels and trading activities, and the global risk sentiment indicator, namely the VIX. Period and interaction dummy variables are also included. The data used consisted of 40 monthly observations in the period before and after in the last 4 cycles of the Indonesian Presidential Election. IHSG volatility is in the spectrum of 0.005 - 0.020, with an average value of 0.00937, indicating that market volatility is relatively moderate, although it is still susceptible to fluctuations throughout the observation period. The PCA score of the macroeconomic channel and trading activity shows an average value close to zero in addition to a standard deviation of close to one, which signifies a considerable degree of variation in economic conditions and market activity at different time intervals. The Global Risk Sentiment (VIX) indicator shows significant variability, signaling a phase of increased global uncertainty that has the potential to affect domestic stock market volatility. The post-election dummy variable had a relatively fair distribution, having an average value of 0.50, which indicates a relatively balanced distribution of observations between the pre- and post-election periods. In addition, the interaction variables between the period dummy and each of the main variable channels also showed adequate variation, thus allowing the regression model to capture the potential differences in the influence of macroeconomic channels, trading activities, and global risk sentiment on IHSG volatility before and after the election.

Table 1. Descriptive Statistic.

Variable	Mean	Std.Dev	Min	Max	N
IHSG Volatility	,00937	,004080	,005	,020	40

Macroeconomic	-,0501103	,95173143	-1,10530	1,73403	40
Trading_Activity	,0173511	,97776581	-1,51167	2,01872	40
VIX	-,0183958	,97447375	-,85161	3,033693	40
Dummy	,50	,506	0	1	40
Macroeconomic_Dummy	-,1093	,55862	-1,11	1,37	40
Trading_Activity_Dummy	,0024	,66550	-1,21	1,61	40
VIX_Dummy	-,1206	,36976	-,81	,67	40

Based on the results of the multicollinearity test in Table 2, all independent variables in the regression model showed a Tolerance value above 0.10 and a Variance Inflation Factor (VIF) below 10. These findings suggest that there is no indication of serious multicollinearity in the research model. The macroeconomic variables and trading activity have VIF values of 7.384 and 9.305, respectively, which are still within acceptable tolerance limits. Meanwhile, the VIX and period dummy variables showed relatively low VIF values, which were below 3, indicating a weak correlation with other independent variables. In addition, all interaction variables (Macroeconomic\_Dummy, Trading\_Activity\_Dummy, and VIX\_Dummy) also have VIF values below 10. This shows that the regression model applied is free from the problem of multicollinearity, so that the estimation of the regression coefficient can be interpreted well and is not affected by excessive linear relationships between independent variables.

**Table 2.** Multicollinearity Test.

Independent Variable	Tolerance	VIF
Macroeconomic	,135	7,384
Trading_Activity	,107	9,305
VIX	,562	1,781
Dummy	,623	1,605
Macroeconomic_Dummy	,165	6,056
Trading_Activity_Dummy	,104	9,596
VIX_Dummy	,376	2,658

Table 3 and Table 4 present the results of multiple linear regression estimation using the Ordinary Least Squares (OLS) method to test the impact of macroeconomic channels, trading activities, and the Volatility Index (VIX) on IHSG volatility in the presidential election period in Indonesia. The results shown in Table 3 show that the VIX variable has a positive and significant influence on IHSG volatility ( $\beta = 0.002$ ;  $p = 0.003$ ), which indicates that increased global market uncertainty correlates with increasing domestic stock market volatility. Meanwhile, macroeconomic variables and trading activities do not show a statistically significant influence on IHSG volatility. However, the evaluation of the feasibility of the model in Table 4 shows that although the model as a whole is statistically significant (F-statistic = 6.791;  $p = 0.000$ ) and has relatively strong explainability (Adjusted  $R^2 = 0.510$ ), a Durbin–Watson value of 1.189 indicates a potential positive autocorrelation in the residual model. This condition implies that the statistical inferences in the OLS model, particularly regarding t-statistical values and the level of coefficient significance, are potentially not entirely reliable. Therefore, the results of the OLS estimates in Table 3 are treated as preliminary results, and this study further applies the Cochrane Orcutt method to correct autocorrelation problems to obtain a more robust and reliable parameter estimate.

**Table 3.** Multiple Linear Regression Results.

Independent Variable	Koefisien ( $\beta$ )	Std. Error	t-Statistic	Sig.
Macroeconomic	,002	,001	1,885	,069
Trading_Activity	,001	,001	,627	,535
VIX	,002	,001	3,224	,003
Dummy	,001	,001	,739	,465
Macroeconomic_Dummy	-,002	,002	-1,139	,263
Trading_Activity_Dummy	,001	,002	,238	,814
VIX_Dummy	,004	,002	1,842	,075

**Table 4.** Statistic Model.

Statistic	Score
R <sup>2</sup>	,598
Adjusted R <sup>2</sup>	,510
F-statistic	6,791
Prob (F-statistic)	,000
Durbin–Watson	1,189

Table 5 and Table 6 present the results of multiple linear regression estimation after autocorrelation correction using the Cochrane Orcutt method. This correction was made in response to the detection of a positive autocorrelation in the previous OLS model, which was indicated by the Durbin–Watson value being below the ideal limit. Therefore, the estimation results in Tables 5 and 6 are treated as the main model in this study because they have met the classical assumptions of regression more comprehensively. The estimation results show that Lag\_VIX has a positive and significant influence on IHSG volatility ( $\beta = 0.003$ ;  $p < 0.01$ ). These findings indicate that the increase in global market uncertainty in the previous period has consistently increased the volatility of the Indonesian stock market. The consistency of the VIX significance before and after the autocorrelation correction shows that the influence of global uncertainty is robust and is not affected by estimation bias in the OLS model. Thus, the VIX acts as the main transmission channel of global uncertainty to the domestic capital market. The Lag\_Macroeconomic variable showed a positive coefficient with a marginal significance level ( $p \approx 0.05$ ), which indicates that aggregate macroeconomic conditions have the potential to affect IHSG volatility, although the statistical evidence is not strong enough to draw definitive conclusions. In contrast, Lag\_Trading Activity and all of its dummy variables and interactions did not show a statistically significant influence. This implies that the impact of the presidential election event on IHSG volatility is not directly influenced by changes in trading activities or aggregate macroeconomic conditions in the short term. In terms of model performance, Table 6 shows an increase in goodness-of-fit after autocorrelation correction. The Adjusted R<sup>2</sup> value increased to 0.558, which indicates that the model is able to explain the variation in IHSG volatility better than the OLS model. The model is also significant overall, as shown by the F-statistical value of 7.862 ( $p < 0.01$ ) and the Durbin-Watson of 1.990 indicating that the autocorrelation problem has been resolved so that the estimation of coefficients and statistical inference in this model can be considered valid and reliable.

**Table 5.** Multiple Linear Regression Results after Autocorrelation Correction.

Independent Variable	Koefisien ( $\beta$ )	Std. Error	t-Statistic	Sig.
Lag_Macroeconomic	,002	,001	2,009	,053
Lag_Trading_Activity	,001	,001	,426	,673
Lag_VIX	,003	,001	4,759	,000
Lag_Dummy	,000	,001	-,114	,910
Lag_Macroeconomic_Dummy	-,003	,002	-1,458	,155
Lag_Trading_Activity_Dummy	,000	,002	,075	,941
Lag_VIX_Dummy	,002	,002	,905	,373

**Table 6.** Statistic Model after Autocorrelation Correction.

Statistic	Score
R <sup>2</sup>	,640
Adjusted R <sup>2</sup>	,558
F-statistic	7,862
Prob (F-statistic)	,000
Durbin-Watson	1,990

#### 4. Discussion

This study analyzes the influence of macroeconomic conditions, trade activities, and global uncertainty on the volatility of the Indonesia Composite Stock Index (IHSG) during the presidential election period in Indonesia. The results of the study show that global uncertainty proxied by the Volatility Index (VIX) is the most dominant and significant factor in explaining the dynamics of IHSG volatility. As explained by (Whaley, 2009) that the VIX reflects the level of risk aversion of global investors which is then transmitted to the international financial markets. These findings indicate that Indonesia's stock market behavior during a sensitive political period is influenced more by global sentiment than domestic factors. The positive and significant influence of the VIX on IHSG volatility is in line with the findings of previous research which stated that increased global uncertainty through the Volatility Index (VIX) has driven up stock market volatility in various countries, including Indonesia (Kirci et al., 2024) The results of this study expand the literature by showing that the transmission effect of global uncertainty also applies to the Indonesian stock market as a developing country, supporting the results (Bhowmik, 2013) which states that developing countries have unique volatility characteristics that are influenced by external factors. On the other hand, macroeconomic factors and trading activities do not show a strong influence on IHSG volatility. Although the macroeconomic factor has a significance of 0.053 indicating a relationship that is close to the level of conventional significance, although it is not statistically significant after autocorrelation correction, the effect is relatively weaker than the global uncertainty. These findings indicate that investors remain rational by monitoring fundamental indicators such as inflation and exchange rates amid political noise, in the short term, especially during election periods, investors tend to respond to global risk signals more quickly than gradual changes in the fundamentals of the domestic economy.

In addition, the insignificance of trading activity suggests that market volatility is not triggered by changes in transaction volume or intensity, but rather by changes in global risk perception. In contrast to research by (Eisler & Kertész, 2007; Liu & Lin, 2025; Xue & Gençay, 2012) which

independently and without election periods link the volume, frequency, and value of trades in line with or contribute to market volatility. The election dummy variable and its interaction before and after the election with macroeconomic factors, trading activity, and VIX also did not show a significant influence on IHSG volatility. This indicates that the presidential election in Indonesia does not directly increase stock market volatility beyond the influence of global uncertainty. Thus, the impact of domestic political events on stock market volatility tends to be smaller than external pressures from global markets. In line with previous research by (Rizkia & Muzzammila, 2020) on political events in Indonesia, namely the Presidential and Legislative Elections in Indonesia in 2019 did not receive a response from the market, as well as when the presidential cabinet reshuffle that occurred twice in 2020 and 2021 also did not receive a strong response from the market (Budastra et al., 2022). More broadly, the findings of this study have important implications for policymakers and market participants in Indonesia. For regulators, these results underscore the importance of monitoring global uncertainty indicators such as the VIX in maintaining financial market stability, especially during the election period. For investors, these findings show that investment risks in the Indonesian stock market are more sensitive to global dynamics than domestic political dynamics, making international diversification strategies and risk management increasingly relevant.

## 5. Conclusions

This study aims to analyze the influence of macroeconomic factors, trading activity, and global sentiment represented by the VIX on stock market volatility in Indonesia. To overcome the unit differences between macroeconomic variables and trade activities, this study uses a data-based Principal Component Analysis (PCA) approach that has been standardized using z-score, so that the composite index produced is more representative and free from scale bias. The results of the initial estimates show that the regression model has autocorrelation problems, which indicates a residual dependence between time periods. Therefore, this study applies the Cochrane Orcutt method as a corrective step. After corrections are made, the estimation results become more reliable and meet the classical assumptions of linear regression, so that the interpretation of the coefficients can be carried out more validly. Based on the regression results after the autocorrelation correction, macroeconomic variables and trading activity show a limited influence on stock market volatility, while the global sentiment indicator represented by the VIX provides a relatively stronger indication of influence. However, some variables show only weak significance or close to the level of conventional significance, so these results need to be interpreted carefully.

This research is the first to combine the 4 latest Indonesian presidential elections on IHSG volatility and tested using VIX and channel trading activities. Moreover, the findings of this study confirm that the volatility of the Indonesian stock market is not only influenced by domestic conditions, but also sensitive to global dynamics. The implications of this study are important for investors and policymakers, particularly in understanding the role of external factors in increasing market uncertainty.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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