Journal of Business Management and Economic Research

2022, 6 (4): 185-211 DOI: 10.29226/TR1001.2022.319

Journal Homepage: https://www.jobmer.org

Moderating Role of Institutional Ownership Structure on the Relationship Between Market Value to Book Value Ratio and Stock Price Volatility of Companies Listed on Nairobi Securities Exchange in Kenya

Joseph Angote Wanda *
Ollessos TTI, Kenya
*Corresponding Author: joswanda.jw@gmail.com

Abstract

This study sought to examine the relationship between market to book value ratio (MPBV) and stock price volatility (SPV) of firms listed on Nairobi securities exchange. The study further explored the moderating effect of institutional ownership structure (INS) on the relationship between market to book value ratio and stock price volatility. Positivism research philosophy and explanatory research design which is panel in nature was adopted by the study to collect secondary data from 39 listed firms at Nairobi Securities Exchange from 2008 to 2019. The data was analysed using descriptive, correlation and panel data regression analysis. The findings indicated that control variables firm size and firm growth were significant to affect stock price volatility. Random effect model showed that market value ratios (MPBV, INS, SZ and GR) predicted 10.45% variation in SPV (R-sq = 0.1045). From the results MPBV (β=-0.0469, p=0.000<.05) and INS (β=-0.0949, p=0.012<.05) negatively and significantly influenced stock price volatility. Further INS moderated the relationship between MPBV (β = 0.0815, ϱ =0.000<.05), and SPV. The study concludes that market to book value ratio influence stock price volatility. Also, institutional ownership structure moderates the relationship between market to book value ratio and stock price volatility.

Keywords: Market value ratio, Book value ratio, Stock price volatility, Nairobi securities exchange

1. Introduction

The tendency for a security's price to move over time is measured by stock price volatility, which is of major interest in the capital market due to its impact on the stability of the stock market and the tactics that investors utilize (Osundina et al., 2016). Over time, increased volatility may drive businesses to devote a higher proportion of their available capital to cash-equivalent investments, which would be detrimental to effective resource allocation. (Rupande et al., 2019).

The volatility of the stock market reflects how investors interpret information and the upcoming clamor from liquidity dealers (Peress & Schmidt 2020). Stock price volatility is a reflection of how investors process information and of the upcoming noise from liquidity dealers (Altig et al., 2020). Consequently, risk-averse investors will become entangled in hedging activities to protect themselves from eventual slumps. If liquidity runs out and hedging costs rise, the smooth operation of the money markets could encounter severe fluctuating technical difficulties. In a high volatility environment, the economy ultimately becomes more vulnerable to risk as a result of pressures in the financial markets. (A El-Masry & El-Ghouty, 2017).

Kumari & Mahakud (2016) claims that when noise traders' irrational activity is shown to have a major impact on explaining stock price volatility, fundamental causes alone are insufficient to account for price variation. Therefore, it is necessary to investigate additional variables that may also be used to account for stock price volatility. However, the evidence regarding the factors that best explain changes in stock price volatility is still equivocal, and theories in this area have not yet reached a consensus. (Nathrah, 2016).

According to Kachchhy (2015), Stock price volatility is influenced by a variety of factors. Financial ratios, including the market price to book value ratio, are the most crucial of these criteria since they provide investors with the specific information they need to decide whether or not to purchase the company's stock (Wang & Luo 2013). Several research studies from the body of literature (Rubin & Smith, 2009; Chen et al., 2013; Jafarinejad et al., 2015; Ni, 2017; Barinov, 2017), have correlated institutional ownership with stock price turbulence. These research have demonstrated a connection between institutional ownership and stock price volatility as well as the stabilizing effect of institutional investors. Additionally, they draw the conclusion that institutional ownership has a negative correlation with stock price volatility since, generally speaking, institutions are risk-averse.

Investors are at risk because of stock price volatility (Tasnia et al., 2020). Investors must correctly identify the variables that cause stock price volatility because stocks are extremely risky. (Pelcher & Bolton, 2021). Pioneering research by Fama and French (1988) and Campbell (1988) proposed that accounting ratios, including the market price to book value ratio, have the ability to anticipate future stock values. (McMillan, 2019).

However, Zainudin, et al. (2018) claims that the mystery surrounding the variables that have a bigger impact on stock price volatility is yet unresolved. Studies on stock price volatility have produced conflicting findings over time (Dabwor et al., 2022). According to Ndwiga and Muriu (2016) The Nairobi Securities Exchange's stock price volatility is not well supported by the available data (NSE).

This study was inspired by a number of reports on stock investments, including a 2007 report from the Capital Markets Authority that showed that over the previous four years (prior to the study period of 2008–2019), the average price of stocks rose to record highs and the price of quoted stocks more than quadrupled. Many investors made large returns during this time. Unfortunately, some investors failed to remember that the same stocks had experienced a record loss just five years before. Furthermore, as of December 2017, the Capital Markets Authority of Kenya approved more enterprises in various categories, indicating a phenomenal development of activity on the Nairobi securities market, according to Financial Sector Regulators Forum (September 2018, Issue No. 9). It's possible that a lack of awareness about the variables an investor should take into account before making an investment decision contributed to the NSE's explosive surge in activity.

This unanswered conundrum regarding the variables that have a higher impact on stock market volatility and the conflicting findings of studies conducted across many exchanges, situated in various global socio-economic and political dimensions, therefore form the research gap. This study aims to close the gap by determining the impact of market price to book value ratio on stock volatility of listed companies at the NSE. The study also looked at the relationship between market price to book value ratio and stock price volatility in order to determine the moderating impact of institutional ownership structure.

This study's goal was to examine the connection between market price to book value ratio and stock price volatility, as well as the moderating role that institutional ownership structure has in this relationship for Kenyan companies listed on the Nairobi Securities Exchange.

The two following hypotheses were put to the test in this investigation.

H_{01}: The market-to-book value ratio has appreciable impact on the sensitivity of Kenyan companies registered on the Nairobi Securities Exchange to changes in the stock price.

H_{02}: The institutional ownership structure of companies listed on Kenya's Nairobi Securities Exchange significantly influence the association between market-to-book value ratio and stock price volatility.

2. Methodology

The paradigm used in this investigation is positivist. The positivist paradigm, according to Martelli and Greener (2018), holds that only knowledge that can be verified through observation and measurement is reliable. In positivist studies, the researcher's responsibility is restricted to gathering data and objectively interpreting it, and the research results are typically observable and quantifiable (Malterud, 2022). Positivism is a term used to describe philosophical perspectives that place a strong emphasis on empirical data and scientific procedures (Samy & Robertson, 2017).

According to Arias-Gómez et al. (2016), the population is the totality of all individuals who meet a set of criteria that apply to the entire group or area of study and to whom the research findings can be applied. All businesses listed on the Nairobi Securities Exchange (NSE) between January 2008 and December 2019 made up the research population for this study. Because NSE is a securities exchange with a presence in the frontier market, it was chosen.

The proposed capital markets policy (CMA) and regulatory adjustments in Kenya's Budget 2008/2009 began in the year 2008. The 2008 global financial crisis decimated the world economies during this time, negatively affecting the capital markets and stock prices (AU Commission, 2009). The three general elections held in Kenya in 2007 (before to the study period), 2012, and 2017 may have had a substantial impact on stock prices and stock price volatility on the Nairobi Securities Exchange (Omollo et al., 2018). In addition, Kenya published a new constitution in 2010 (during the study period), and NSE reviewed policy structures. Other changes included the adoption of new technologies to help the sector run smoothly (NSE, 2018). For instance, the NSE created the CHU (Complaints Handling Unit) in 2009 with the goal of responding quickly to inquiries from investors.

Inclusion and exclusion were used in this investigation. This non-probability method is based on the study's goal and the characteristics of a population (Baltes & Ralph, 2020). This standard is comparable to judgmental, intentional, or subjective (Bappy et al., 2019). Regardless of the industry sector, financial year-end, or any other distinguishing factor, companies that satisfied the inclusion criteria were included in the entire sample. The regressions were carried out using the biggest samples and the least amount of selection bias.

The data used in this study was derived from public annual financial statements and the yearly average stock prices of all the companies registered on the Nairobi Securities Exchange. On December 31, 2019, there were 66 firms listed on the NSE. 39 firms out of the 66 listed on the NSE were included in the study, as can be seen in the table below.

Table 1. NSE-listed companies as of December 31, 2019

Sector	**Total No. of Listed Firms**	**Total No. Excluded**	**Total No. Included**
1. Agricultural	6	2	4
2. Automotive & Accessories	2	-	2
3. Banking	13	3	10
4. Commercial & Services	11	5	6
5. Construction & Allied	5	-	5
6. Energy & Petroleum	6	3	3
7. Insurance	6	4	2
8. Investment & Investment services	6	5	1
9. Manufacturing & Allied	8	3	5
10. Telecommunication	1	-	1
11. Real estate investment trust	1	1	-
12. Exchange traded funds	1	1	-
Total	**66**	**27**	**39**

For inclusion, a company must have been listed on the NSE before to 2008 and must continue to be listed during the study period (2008 to 2019). Also, businesses that possess the data needed for this study are included.

**Companies that don't fit the criteria for selection aren't included in the study.*

The Nairobi Securities Market Manual, CMA, and published financial statements of the listed companies were used to compile data on share prices and independent variables (market to book value ratio, earnings

per share, price earnings ratio, book value per share, and dividend yield). Operationalization and Measurement of Variables.

2.1. Regression Model

The OLS multiple panel linear regression analysis was used in this study to determine the relationship between the study variables. Multiple regression analysis attempts to predict changes in the dependent variable as a result of changes in the independent variables (Biecek & Burzykowski, 2021). As a result, multiple regression equations are a technique that can provide the researcher with both prediction and explanation (Khambra & Shukla, 2021). Multiple regression models, according to Varoquaux (2018), require a sample size of between 30 and 100 for the best analytical results. The multiple regression analysis was appropriate for data analysis because this study targeted a population of 66 companies listed on the Nairobi Securities Exchange.

A moderator variable is a third variable that influences the strength of the relationship between two variables (Baron & Kenny 1986). Enhancing, where increasing the moderator increases the effect of the predictor (Independent Variable) on the outcome (Dependent Variable), or buffering, where increasing the moderator decreases the effect of the predictor on the outcome. Or antagonistic, in which increasing the moderator reverses the predictor's effect on the outcome. If the moderator variable is significant, it can cause an amplifying or weakening effect between the dependent and independent variables (Memon et al., 2019).

The measurement of the causal effect of independent variable X on dependent variable Y for different levels of moderating variable M is an important part of moderation. The effect of X on Y for a fixed value of M is referred to statistically as the 'simple effect' of an independent variable on its dependent variable.

The methodology used in the study was based on Adler and Dumas' (1984) and Jorion's (1990) models (Li et al., 2022). By assuming a linear relationship between the variables, the model explains expected stock prices. According to Rasoolimanesh, Ali, and Jaafar (2018), if the relationship between variables is not linear, the regression analysis results will underestimate the true relationship.

The independent variable in the current study is market price to book value (MPBV). Institutional ownership (INS) is the moderating variable, and stock price volatility is the dependent variable (SPV). The

following empirical panel data model is used to test for the moderation effect of the institutional ownership structure on the independent variable and the dependent variable after fitting the equation on the variables in the study.

$$SPV_{it} = \beta_0 + \beta_{it}MPBV_{it} + \beta_{it}INS_{it} + \beta_{it}MPBV_{it} * \beta_{it}INS_{it} + v_{it} + \varepsilon_{it} \ldots\ldots\ldots$$

Where: $i = 1, 2 \ldots N, t = 1, 2, 3 \ldots T$

Here i is the cross section and t is the time. Since the SPV variable has different values in each time period of each unit, it is expressed with two sub-indices as i and t. SPV_{it} = dependent variable which represent changes in stock prices of company i at time t. β_0 = the intercept or constant term of company i at time t, β_{it} = the coefficient of the independent variable, moderator variable and interaction variable respectively at time t which represents the sensitivity of stock price volatility of company i at time t., $\beta_{it}MPBV_{it}$= Changes in the independent variable of company i at time t, $\beta_{it}INS_{it}$= The direct effect of the moderator variable (institutional ownership structure) on the dependent stock price volatility. $\beta_{it}MPBV_{it} * \beta_{it}INS_{it}$ =The interaction term of the independent variable and the moderator variable. Finally, v_{it} individual specific effects and ε_{it} = white noise or error term of company i at time t.

3. Results and Discussion

The data in the study were described using measures of central tendency and dispersion. According to (Cohen et al., 2014), descriptive statistics are important in analysis because they allow for the meaningful presentation of raw data. It provides a general overview of the sample and helps to rationally simplify large data sets (Fernández et al., 2018). Table 2 summarizes the descriptive statistics of the sample data. The study period runs from 2008 to 2019, yielding a total of 468 observations (there were 39 firms studied each observed for 12 years).

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SPV	468	0 .1556539	0.1368722	0	1.343
MPBV	468	1.363242	1.568095	0	8.53
INS	468	0.3602226	0.2242565	0.0101	0.8174
SIZE	468	6.992144	0.6682681	4.51	8.0672
GR	468	0.1235174	0.2196475	-0.6103	1.5788

Stock price volatility is a statistical measure of a security's price fluctuation over time (Osundina et al., 2016). Stock price volatility (SPV) ranged from zero to 1.343, with a mean of 0.1557 and a standard deviation of 0.1369. The low standard deviation indicates that stock price volatility oscillated around the mean during the study period. Furthermore, the market price book value ratio (MPBV) is the ratio of a share's market value to its book value, which is calculated by dividing the market capitalization by the net assets (Marangu & Jagongo, 2014). According to the data in the preceding table, listed firms on the NSE had an average market price book value of 1.363242 and a standard deviation of 1.568095. The lowest and highest market to book values were 0 and 8.53, respectively. A small average value of 1.363242 with a slightly higher standard deviation indicates that there are significant differences between firms. Furthermore, institutional ownership refers to the amount of a company's available stock owned by institutions such as insurance companies, investment firms, private foundations, endowments, or other large entities that manage funds on behalf of others (Singh & Kansil, 2018). Institutions own an average of 36.02 percent (mean of 0.360226) of the stock in NSE. The lowest level of institutional ownership is approximately.0101 (1%) and the highest level is 81.74 percent (maximum of 0.8174).

In terms of control variables, firm size had a low standard deviation (0.6682) and a mean of 6.992144. This low standard deviation implies that the majority of firms are roughly the same size (not much deviation from their means). Similarly, some firms experienced negative growth (a minimum of -.6103) and a maximum of 1.5788, with an average growth rate of 12.35 percent (a mean value of 0.1235) and a standard deviation of 0.2196475.

3.1. Pearson Correlation Analysis

Any statistical relationship, whether causal or not, between two random variables is referred to as correlation (Cohen et al., 2014). Correlation can refer to any statistical association, but it specifically refers to the degree to which two variables are linearly related (Schober et al., 2018). The Spearman correlation coefficient measures the degree of association (Wang et al., 2022). The Pearson correlation analysis is shown in Table 3.

Table 3. Pearson correlation coefficients

	SPV	MPBV	INS	SIZE	GR
SPV	1.0000				
MPBV	-0.2014	1.0000			
INS	-0.0028	0.0321	1.0000		
SIZE	-0.1571	0.1886	0.0847	1.0000	
GR	-0.1677	0.0095	-0.0834	0.1455	1.0000

All of the variables have a negative relationship with the volatility of the stock market. Control variables such as firm size and firm growth, for example, correlate to stock prices with coefficients of =-0.157 and =-0.168, respectively. Market price book value (=-0.201) has a higher than 20% correlation with stock price volatility, while institutional ownership structure has a much lower correlation (-0.0028). Despite the fact that the relationship is assumed to be linear, correlation does not prove causation; it only indicates the strength and direction of the correlation (Collier, 2020). Regression (Gelman et al., 2020), which involves estimating the best straight line to summarize the relationship, is a technique that shows causation that is frequently used in these situations.

The negative correlation between each explanatory variable and stock price volatility implies that increased volatility induces regulatory capital suppliers to force organizations to allocate a larger percentage of available capital to cash-equivalent investments, potentially to the detriment of efficient allocation (Rupande et al., 2019).

3.2. Data Preparation for Inferential Analysis

Before analyzing inferential statistics, stationarity testing is essential because all data in the data generating process (DGP) exhibit three types of graphs based on the stochastic process that happens by chance: trending, drifting, and trending with drifts. Non-stationarity can be caused by any of these. The next step was to check for the presence of a unit root for each variable. The exam was conducted under the supervision of the DGP (2012). A unit root-test is a property that is often evaluated with time-varying parameters (Pesaran, 2021). If a series has no unit root, it is said to be stationary. The absence of a unit root means that the mean, variance, and covariance remain constant across time (Omay & Baleanu, 2021).

Estimating regression models with non-stationary series data results in interpretations that include no significant information about the broader population being studied, resulting in misleading results (Ali, et al. 2021). This study employed two panel unit root tests: the Levin, Lin, and Chu (LLC) provided by Levin, Lin, and Chu, (2000), and the Im-Pesaran-Shin (IPS) produced by Im-Pesaran-Shin (2003). Caglar et al. (2021) recommend doing many panel unit root tests to ensure consistency and robustness.

3.3. Levin-Lin-Chu Unit Root Test

The Levin-Lin-Chu (LLC) test was the first to be employed. The panel test evaluates homogenous cross-sections, resulting in a test on a pooled data set. Using this test, according to Levin, Lin, and Chu (2000), greatly increases the test's power. There is an additional demean choice in the test. To reduce the impact of cross-sectional correlation, this option eliminates cross-sectional means from the series. The maximum delays on the individual unique impacts and a linear temporal trend were chosen using an information criteria. Levin-Lin-Chu demands that the number of panels in proportion to time periods approaches zero asymptotically.

Panel unit root tests have become widely used in empirical economics, although there are still questions about how to appropriately interpret the test findings. This note explains why rejecting the panel unit root hypothesis means that a statistically significant proportion of the units are stationary. As a result, it suggests that, in the case of a rejection, especially in situations where the panel's temporal dimension is quite large, the test result be complemented by an estimate of the fraction of cross-section units for which the individual unit root tests are failed (Pesaran, 2012).

This test is an enhancement on the Augmented Dickey Fuller test, which is a common time series unit root test technique. It employs an inverse normal z-statistic from Augmented Dickey Fuller with two delays and assumes asymptotic normality of the data (Stanii & Jankovi, 2022). The null hypothesis is that the panel has a unit root, whereas the alternative hypothesis is that the panel is stationary.

Table 4. Results for Levin-Lin-Chu Unit Root Test

Levin-Lin-Chu Unit Root Test				
H_0: Panels contains unit root				
H_1: panels are stationary				
AR parameter: common				
LR variance: Bartlett kernel: 7.00 lags average (chosen by LLC)				
Number of panels = 39				
Number of periods = 12				
Asymptotic: N/T→ 0				
At Levels				
Individual Intercept Included				
Variables	**Unadjusted *t***	**Adjusted t^***	**p-value**	**Remark**
SPV	-16.3251	-9.8497	0.000	Stationary
MPBV	-14.1973	-8.5207	0.000	Stationary
INS	-13.4027	-7.8923	0.000	Stationary
FZ	-14.1479	-7.4280	0.000	Stationary
FG	-15.5768	-9.8858	0.000	Stationary

Key: FS-Firm Size, FG-Firm Growth, **SPV**-Stock Price Volatilities, **MPBV**-Market Price Book Value, and **INS**-Institutional

Nota Bene: Null Levin-Lin-Chu Unit root is the hypothesis. The inverse normal Z-statistic from the Augmented Dickey Fuller (ADF) unit root test with two lags, individual specific means, a linear temporal trend, and demeaned series is referred to in the test. It is based on asymptotic normality.

All variables, including stock price volatility (SPV), market to book value (MPBV), institutional ownership (INS), and controls such as firm size (FS) and firm growth (FG), were found to be stationary at levels. This is due to the probability being smaller than the 0.05 significance level. As a result, the study determined that the null hypothesis was rejected and that the alternative hypothesis of panels being stationary is correct. All of the data at their respective levels are stationary (no unit root present).

3.4. Im-Pesaran-Shin Unit Root Test

Im-Pesaran-second Shin's unit root test, also known as IPS, which was created in 2003, was used. However, as panels might be made up of several cross-sections with various autoregressive coefficients, the homogeneity hypothesis employed in earlier tests LLC may be too constrained (Barreira & Rodrigues, 2005). The key defense is that panel unit root tests may be biased under the alternative hypothesis if entities have the same convergence rate. Imposing homogeneity when there is coefficient variability in cross-section data might lead to incorrect results. The IPS test provides a workaround for this limitation (Im, Pesaran & Shin, 2003).

Their p-values were below than the 5% level of significance. Gujarati (2010) indicated that unit root variables are differenced to any order till they become stationary, implying that the variables were integrated after initial difference. However, in this study, all variables are stable at the level, suggesting that the mean, variance, and covariance remain constant across the study period, resulting in no differencing.

Table 5. Results for Im-Pesaran-Shin Unit Root Test

Im-Pesaran-Shin Unit Root Test					
H_0: Panels contains unit root					
H_1: panels are stationary					
AR parameter: common					
LR variance: Bartlett kernel: 7.00 lags average (chosen by IPS)					
Number of panels = 39					
Number of periods = 12					
Asymptotic: N/T→ Infinity sequentially					
At Levels					
Individual Intercept Included					
Fixed-N exact critical values					
		1%	**5%**	**10%**	
		-2.040	**-1.900**	**-1.810**	
Variables	***t*-bar**	***t*-tilde bar**	**$z-t$-tilde bar**	**P**	**Remark**
SPV	-6.6039	-4.4778	-13.0917	.0000	Stationary
MPBV	-5.7113	-4.1839	-11.8139	.0000	Stationary
INS	-5.3147	-4.0299	-11.1480	.0000	Stationary
FS	-5.5905	-4.1418	-11.6336	.0000	Stationary
FG	-6.2112	-4.3289	-12.4455	.0000	Stationary

FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, and INS-Institutional Size are all important.

Note: Null Im-Pesaran-Shin Unit root is the hypothesis. It employs the IPS-t-bar statistic, which is produced using the Akaike Information Criterion (AIC) with a maximum of one lag, a linear temporal trend, and demeaned series.

3.5. Testing the Assumptions of Multivariate Linear Regression

Regression analysis describes the statistical relationship or correlation between research variables (Guerard, 2013). Any regression model must make certain statistical assumptions; however, if these assumptions are broken, the projected findings are inaccurate, biased, inconsistent, and inefficient, resulting in erroneous conclusions and suggestions for future researchers (Williams & Quiroz, 2020). The following assumptions were tested in this study: normality, multicollinearity, heteroskedasticity, and autocorrelation.

3.5.1. Normality

The Shapiro-Wilk test was performed to verify whether the collected data came from a regularly distributed population. When the p-value is larger than 0.05, the null hypothesis of normal data is accepted, according to the Shapiro-Wilk test. If the value is less than 0.05, the data has severely departed from the normal distribution (Khatun 2021). According to the results in Table 6, the likelihood of the data on each variable was more than the 5% significance threshold ($p > 0.05$). As a consequence, the study determined that the data utilized were normally distributed and that the results were efficiently, consistently, and unbiasedly interpreted.

Table 6. Result for Shapiro-Wilk W Test for normal data

Variables	Obs	W	V	Z	Prob>Z
SPV	468	.772	2.373	1.262	.208
MPBV	468	.751	8.971	1.471	.142
INS	468	.957	.539	.245	.810
FS	468	.935	.559	.246	.803
FG	468	.829	.299	.573	.569

Key: FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value and INS-Institutional

3.5.2. Multicollinearity

A variance inflation factor (VIF) reveals multicollinearity in regression analysis (Shrestha, 2020). The VIF measures how much a regression coefficient's variance is exaggerated as a result of model collinearity (Ma et al., 2020). A value of one shows that there is no connection between the independent variables. VIFs ranging from 1 to 5 show a substantial association, but it is not severe enough to warrant remedial action. VIFs larger than 5 show significant levels of multicollinearity, indicating that the coefficients are poorly calculated and the p-values are questionable (Shrestha, 2020). According to the data in Table 7, the mean VIF for all variables in the study is 1.12, and each of the independent variables has a VIF less than 2, suggesting that the explanatory variable, moderator, and control variables utilized in the study are identically and independently distributed.

Table 7. Results for Multicollinearity Test

Variable	VIF	TOLEANCE (1/VIF)
MPBV	1.10	.911686
INS	1.09	.915608
FS	1.09	.919439
FG	1.05	.954065

Key: FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value and INS-Institutional

3.5.3. Heteroscedasticity

The assumption that mistakes have the same variance across all levels of independent variables is referred to as homoscedasticity (Astivia & Zumbo, 2019). This suggests that the researchers believed that mistakes are distributed uniformly across variables in the study (Alemi et al., 2019). To examine homoscedasticity, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity was utilized. The chi-square test is used in the Breusch-Pagan/Cook-Weisberg test, where the null hypothesis is that the variance is constant. The result in Table 8 suggests a probability of 0.813 >.05, meaning that the null hypothesis was not rejected and that residuals have constant variance (homoscedastic).

Table 8. Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Breusch-Pagan / Cook-Weisberg test for
Ho: Constant variance
Variables: fitted values of SPV
Chi2(1) = .092
Prob > Chi2 = .813

3.5.4. Autocorrelation

Autocorrelation examines the link between a variable's current value and its previous or lag values (Zhang et al., 2020). The Breusch-Godfrey LM serial correlation test was used in this work to measure autocorrelation, which is regarded to be more accurate (ISLAM & Erum, 2019). This is because the existence of systematic correlation between one observation of the error term and the other implies that conventional econometric assumptions are broken, making obtaining accurate standard errors of coefficient estimations problematic. The decision rule is to accept the null hypothesis, and the findings in Table 9 shows that the probability for the Breusch-Pagan LM test is 0.7212, which is larger than .05, indicating that the null hypothesis of no autocorrelation was accepted.

Table 9. Results for Autocorrelation Test

Null hypothesis: No autocorrelation) in residuals			
Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	0.356900	741	0.7212
Pesaran scaled LM	21.45095		0.0000
Note: non-zero cross-section means detected in data			
Cross-section means were removed during computation of			

3.6. Linearity

In a generic linear model, it is assumed that the independent variables have a linear relationship with the dependent variable (Dobson & Barnett, 2018). Linearity is defined as the amount of change or rate of change between two variables that is consistent over the whole range of scores for the variables (Kadim et al., 2020). Scatter plots can be used to investigate the relationship between the variables in the research (Ceylan, 2021). The scatter plot in the figure below demonstrates that the connection between the values of the dependent

variable (stock price volatility) and the residuals of the independent variable (market price to book value) was linear.

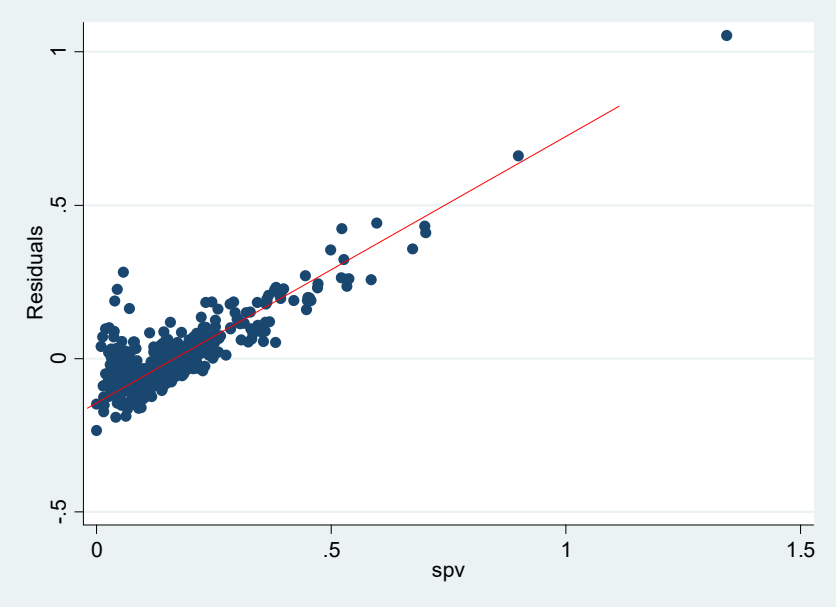

Figure 1. Linear Relationship between SPV and Residuals of independent variable

3.7. Regression Analysis

The panel models estimated in this study are random effect and fixed effect. Particular individual effects in the random effect model are supposed to be uncorrelated with explanatory factors, whereas specific individual effects in the fixed effect model are assumed to be associated with explanatory variables (Ba et al., 2021). Panel data allows for the estimate of links between two or more entities (listed businesses) with time invariant and unobserved features (Hsiao, 2022). The distinction between random and fixed effects is whether the unobserved individual characteristics effect contains aspects that are connected with the model's independent variables or not (Damrongplasit & Hsiao, 2022).

The study used the fixed effects model and the random effects model to the fundamental model, and the Haussmann test findings suggested that the fixed effect model is appropriate.

The fixed effects model's findings are displayed in table 10.

Table 10. Fixed Effects (Within) Regression

```
. xtreg spv size gr mpbv ins  mpbv_ins, fe
Fixed-effects (within) regression          Number of obs      =       468
Group variable: year                       Number of groups   =        12
R-sq:  within = 0.0961                     Obs per group: min =        39
       Between = 0.5047                                    avg =      39.0
       Overall = 0.1045                                    max =        39
                                           F (5,451)          =      9.59
corr(u_i, Xb)  = 0.0800                    Prob > F           =    0.0000
------------------------------------------------------------------------------
         Spv |      Coef.   Std. Err.      T    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        Size |  -0.0278471   0.0096949    -2.87   0.004    -0.0469    -0.0087942
          Gr |  -0.0873444   0.0297177    -2.94   0.003    -0.1457469  -0.028942
        Mpbv |  -0.0469473   0.0095892    -4.90   0.000    -0.0657922  -0.0281023
         INS |  -0.0949393   0.0376035    -2.52   0.012    -0.1688391  -0.0210396
    mpbv_ins |   0.0815296   0.022248      3.66   0.000     0.0378069   0.1252522
       _cons |   0.4183979   0.0687357     6.09   0.000     0.2833159   0.5534799
-------------+----------------------------------------------------------------
     sigma_u 0.01708339
     sigma_e  0.13074987
         Rho 0 .01678473   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

3.8. Hypotheses Testing

The hypotheses were tested using panel regression analysis based on the results of the fixed effect model in the preceding table. Because there was no unit root, regression analysis was performed on the levels of the series (no differencing). The results show that the simulated variables suit the data fairly well. This is due to the fact that the f-statistic is significant (p-value 0.000 0.05). This was a good indicator because it indicates a strong correlation, indicating that the explanatory variable, market price book value moderator variable- institutional ownership structure, and the control variables (firm size and growth) have a significant impact on stock price volatility among Nairobi Securities Exchange listed firms in Kenya.

The coefficient of determination, R-squared, demonstrates the amount of changes produced by exogenous factors such as market price, book value, institutional ownership structure, and control variables such as

business size and growth on the endogenous variable. The total R-square in fixed effects is 0.1045, meaning that Exogenous Variables accounted at least 10.45 percent of the variance in the Endogenous variable, while the remaining 89.55 percent is driven by other factors outside this model, as reflected by the error term. This implies that market price, book value, and control variables such as business size and growth accounted 10.45 percent of the overall variance of stock price volatility of firms listed on the Nairobi Securities Exchange in Kenya, while the remaining 89.55 percent is explained by other factors. This conclusion is comparable to that of Awalakki (2021), who discovered a substantial negative link between business market price to book value and return on equity, with a 95 percent degree of confidence and a weak R-squared of 0.0762 (7.62 percent).

According to the first hypothesis, H 01: Market to book value ratio has no substantial effect on stock price volatility at Nairobi Securities Exchange in Kenya. According to the study findings, the market to book value ratio has a negative impact on stock price volatility (1 = -0.0469473, p value=0.000.05). This means that hypothesis H01, which stated that the market to book value ratio had no effect on stock price volatility for businesses listed on the Nairobi Securities Exchange, was rejected. As a result, the study concludes that increasing the market to book value ratio by one unit results in a -0.0469473 unit decrease in stock price volatility. The hypothesis is denied, and the analysis concludes that stock price volatility is highly influenced by market price book value. The negative effect suggests that increasing the market-to-book ratio by one percent reduces stock price volatility by 4.5 percent. This finding indicates that stocks having a larger market value are less likely to be volatile. As a result, the market to book value ratio has a negative impact on stock price volatility. The findings of this study are consistent with the findings of Bianconi and Yoshino (2017), who determined that firms with a high market-to-book ratio are far more confident in their future prospects, resulting in less volatile stock prices. Larcker (2011) found that market-book value is highly connected to market outlook. The market-to-book ratio is a gauge of growth potential, and a negative coefficient (on stock price volatility) shows that investors pay more attention to firms with outstanding growth prospects and improve their returns during good times. Bianconi and Yoshino (2017) discovered comparable results in their analysis and concluded that firms with a high market-to-book ratio are far more confident about their future prospects, resulting in less volatile stock prices. According to Thanatawee (2021), the market-to-book ratio is frequently used as a proxy for a company's development potential, and their analysis found that the market-to-book value ratio is substantial and positively

associated to stock price volatility. As a result, firms with a high market-to-book ratio, commonly known as growth stocks, signal that the market highly values the company and that its future is very bright. According to Dung (2018), the market to book ratio is a statistic for measuring a company's development potential. When a company has high growth potential, it will convey corporate information to the market more freely so that investors may analyze the company's ability, reducing the chance of fluctuating stock prices. Despite the numerous supporters of the research conclusions, Wagle's (2021) study deviates and finds that market to book value has a positive and substantial influence on stock price volatility. The price of a single share of a company's sellable stock, known as the stock price, is a particularly sensitive component for firms listed on the stock exchange. The stock market represents the economy, which is vital to the industrial and commercial growth of the country (Silwal & Napit, 2019). When the stock price is stable, the board of directors and management are pleased; when it becomes erratic, all involved parties, including shareholders, get anxious.

Furthermore, investors are severe risk averters, and the unpredictability of their investments is a major concern for them when determining which investment choice to pursue after assessing the type of the risk they may encounter (Hunjra et al., 2014). According to Vutale and Chen (2017), a corporation with higher earnings per share is a motivator for both investors and shareholders since it assures the firm's continuing concern, which tends to attract numerous investors. However, the current findings contradict Thanatawee's (2021) conclusions that the market to book value ratio is considerable and positively associated to stock price volatility. The link between markets and book value ratio appears to be understudied. As a result, the current study adds to our understanding of the negative relationship between market to book value ratio and stock price volatility. Furthermore, Fairfield (2014) and Serra and Fávero (2018) discovered that the market price-book value multiple had a favorable link with chosen businesses' future share return. Thus, the debate over whether the market price-book value multiple may anticipate company stock price volatility remains unresolved.

The interaction term between market to book value ratio and institutional ownership structure was included in the model to test the second hypothesis that institutional ownership structure does not significantly moderate the relationship between market to book value ratio and stock price volatility of companies listed on the Nairobi Stock Exchange The findings on the moderating effect of institutional

ownership revealed that institutional ownership structure has a positive and significant moderating effect on the relationship between market price to book value ratio and stock price volatility of companies listed on the Nairobi Securities Exchange (= 0.0815296,.05). The inclusion of institutional ownership structure increases the impact of the market price to book value ratio on stock price volatility. However, because the beta value is tiny, the moderating influence of institutional ownership structure on the link between market to book value ratio and stock price volatility is limited. The findings are consistent with Potter's (1992) conclusion that more institutional ownership is associated with higher stock return volatility (Harjoto & Kim, 2017). Potter (1992) concluded that the enticement of additional institutional investors contributed to an indirect association between disclosure policies and stock return volatility (Bushee & Noe, 2000). The findings, however, contradict the findings of Lin et al. (2018), who showed that larger institutional ownership structure leads to decreased stock price volatility in Macao casino equities.

According to Aiken and West (1991), it is inadequate to infer that there is interaction without examining the nature of that interaction at different levels of the moderator. Moderated data are shown on a moderation graph (Dawson, 2014). When an interaction is discovered, it should be investigated in order to better understand the circumstances that lead to the existence of the link between the moderator and the endogenous variable. Cheung and colleagues (2021). The degree of institutional ownership structure's moderating influence on the link between market to book value ratio and stock price volatility, price earnings ratio and stock price volatility, dividend yield and stock price volatility is shown below.

According to Table 11, institutional ownership had a strong moderating influence on the link between market to book value ratio and stock price volatility. However, the moderation was significant, showing that as institutional ownership structure increases, the influence of market to book value ratio on stock price volatility decreases. The magnitude of the moderating effect of institutional ownership structure on relationship between market to book value ratio and stock price volatility, price earnings ratio and stock price volatility, dividend yield and stock price volatility, are demonstrated below.

Based on Table 11 there was significant moderating effect of institutional ownership on the relationship between market to book value ratio and stock price volatility. However, the moderation was buffering indicating that with increasing the institutional ownership structure, there is decreasing effect of market to book value ratio on stock price volatility.

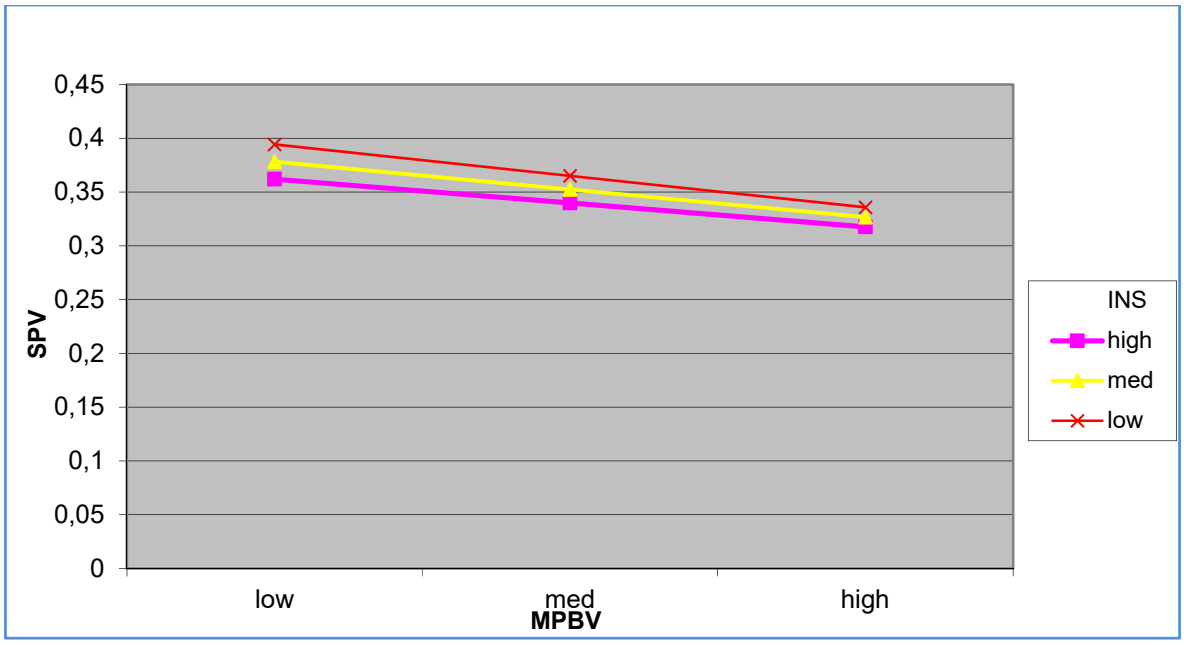

Figure 2. Effect of INS on MPBV and SPV

4. Conclusion

According to the study's findings, the market to book value ratio has a negative effect on stock price volatility. The consequence is that corporations with high book values have large reserves, which contribute to decreased share price volatility. Furthermore, the market to book value ratio depicts the efficiency with which the market perceives the firm to be handled, improving investors' trust in the company's soundness. However, when tempered by institutional ownership structure, the market to book value ratio has a favorable impact on stock price instability.

4.1. Suggestions

Because share price volatility has a substantial impact on stock market performance, the study advises that policy entities such as the Capital Markets Authority of Kenya create effective measures to reduce high share volatility.

The report also suggests that the Central Bank of Kenya develop effective policies, such as interest rate policies, to reduce the influence they have on the economy and the stock market, which would be beneficial to Kenya's stock market. The conclusions of this study make a substantial contribution to the notion profits

pricing model. The stock price can be stated as an average weighted book value, price risk, and earnings under particular conditions. In terms of conclusions, the study has offered detailed empirical research on the influence of market price, book value, and institutional ownership on stock price fluctuations in the context of listed businesses on the Nairobi Securities Exchange. These findings will be useful to policymakers.

Institutional investors might use the findings as a monitoring device. They may lessen the need for capital markets to acquire external monitoring systems. Institutional investors have a critical role in reducing agency conflicts. This can be accomplished by closely monitoring management performance or even seizing ownership of the company itself. The study also suggests that institutional shareholders with considerable ownership have significant incentives to watch management, lending credence to agency theory.

Because the independent factors included in the current study have a poor explanatory capacity, further research on the issue should investigate whether macroeconomic indicators and other potential variables impact the share price volatility of businesses listed on the Nairobi Securities Exchange. Future researchers might also perform studies across other time periods to see if the current study findings will change over time. A parallel study can be conducted on other stock exchanges to see if similar results are achieved. A research on how manipulated market value ratios affect stock price volatility might also be investigated. Another intriguing area of research may be the effect of an irregular or inconsistent payout policy on stock price volatility.

References

A El-Masry, A., & El-Ghouty, A. (2017). Effect of ownership structure on firm stock return performance: Evidence from the Egyptian stock market, *International Research Journal of Finance and Economics,* 160, 63-83.

Al-Slehat, Z. A. F., Zaher, C., Fattah, A., & Box, P. O. (2020). Impact of financial leverage, size and assets structure on firm value: Evidence from industrial sector, Jordan. *International Business Research*, *13*(1), 109-120.

Alemi, F., Circella, G., Mokhtarian, P., & Handy, S. (2019). What drives the use of ridehailing in California? Ordered probit models of the usage frequency of Uber and Lyft. *Transportation Research Part C: Emerging Technologies*, *102*, 233-248.

Ali, S. E. A., Lai, F. W., Hassan, R., & Shad, M. K. (2021). The long-run impact of information security breach announcements on investors' confidence: The context of efficient market hypothesis. *Sustainability*, *13*(3), 1066.

Ali, Q., Yaseen, M. R., Anwar, S., Makhdum, M. S. A., & Khan, M. T. I. (2021). The impact of tourism, renewable energy, and economic growth on ecological footprint and natural resources: A panel data analysis. *Resources Policy*, *74*, 102365.

Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S. ... & Thwaites, G. (2020). Economic uncertainty before and during the COVID-19 pandemic. *Journal of Public Economics*, *191*, 104274.

Alzeaideen, K.A., & Al_Rawash, S.Z. (2014). The effect of ownership structure on share price volatility of listed companies in Amman Stock Exchange. *Research Journal of Finance and Accounting,* 5(6), 192-201.

Arias-Gómez, J., Villasís-Keever, M. Á., & Miranda-Novales, M. G. (2016). The research protocol III. Study population. *Revista Alergia México*, *63*(2), 201-206.

Astivia, O. L. O., & Zumbo, B. D. (2019). Heteroskedasticity in Multiple Regression Analysis: What it is, How to detect it and How to solve it with Applications in R and SPSS? *Practical Assessment, Research, and Evaluation*, *24*(1), 1.

Awalakki, M., & HN, D. (2021). Impact of Financial Performance Ratios on Stock Returns–A Study With Reference to National Stock Exchange. *Int. J. of Aquatic Science*, *12*(3), 2151-2167.

Ba, Y., Berrett, J., & Coupet, J. (2021). Panel data analysis: A guide for nonprofit studies. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 1-16.

Baltes, S., & Ralph, P. (2020). Sampling in software engineering research: A critical review and guidelines. *arXiv pr eprint arXiv:2002.07764*.

Bappy, M. M., Ali, S. M., Kabir, G., & Paul, S. K. (2019). Supply chain sustainability assessment with Dempster-Shafer evidence theory: Implications in cleaner production. *Journal of Cleaner Production*, *237*, 117771.

Barinov, A. (2017). Institutional ownership and aggregate volatility risk. *Journal of Empirical Finance*, *40*, 20-38.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, *51*(6), 1173.

Bianconi, M., & Yoshino, J. A. (2017). Valuation of the worldwide commodities sector: The role of market-to-book and return on equity. *Studies in Economics and Finance*.

Biecek, P., & Burzykowski, T. (2021). *Explanatory model analysis: Explore, explain and examine predictive models*. Chapman and Hall/CRC.

Campbell, J.Y. & Shiller, R.J. (1988). The dividend-price ratio and expectations of future dividends and discount factors. *Review of Financial Studies* 1, 195-228.

Ceylan, Z. (2021). Insights into the relationship between weather parameters and COVID-19 outbreak in Lombardy, Italy. *International Journal of Healthcare Management*, *14*(1), 255-263.

Cheng, C.S., Lee, B.S., & Yang, S. (2013). The value relevance of earnings levels in the return-earnings relation. *International Journal of Accounting and Information Management*, *21*(4), 260-284.

Chen, H. L., Hsu, W. T., & Chang, C. Y. (2014). Family ownership, institutional ownership, and internationalization of SMEs. *Journal of Small Business Management*, *52*(4), 771-789.

Cohen, P., West, S. G., & Aiken, L. S. (2014). *Applied multiple regression/correlation analysis for the behavioral sciences*. Psychology press.

Collier, J. E. (2020). *Applied structural equation modeling using AMOS: Basic to advanced techniques*. Routledge.

Dabwor, D. T., Iorember, P. T., & Yusuf Danjuma, S. (2022). Stock market returns, globalization and economic growth in Nigeria: evidence from volatility and cointegrating analyses. *Journal of Public Affairs*, *22*(2), e2393.

Dawson, J. F. (2014). Moderation in management research: What, why, when, and how. *Journal of business and psychology*, *29*(1), 1-19.

Dobson, A. J., & Barnett, A. G. (2018). *An introduction to generalized linear models.* Chapman and Hall/CRC.

Dung, P. T. (2018). Foreign ownership and stock return volatility of industrial firms in Ho Chi Minh stock exchange (Doctoral dissertation, International University-HCMC). Dynamic Institutional Preferences", *The Review of Financial Studies,* Vol.16, n° 4, pp.1203-1238.

Erdaş, M. L. (2020). Examining the Validity of the Weak and Semi-Strong Market Efficiencies at the Global Islamic Stock Markets: Evidence Linear and Nonlinear Unit Root Tests and Bootstrap Causality Approach. *Third Sector Social Economic Review*, *55*(4), 2168-2189.

Fahim, S. R. S. N., Kheradyar, S., & Atabakhsh, R. (2016). Accounting variables ability to explain the price volatility in the stock market. International journal.

Fama, E.F. & French, K.R. (1988). Dividend yields and expected stock returns. *Journal of Financial Economics*, 22, 3-25.

Fernández, A., García, S., Galar, M., Prati, R. C., Krawczyk, B., & Herrera, F. (2018). *Learning from imbalanced data sets* (Vol. 10, pp. 978-3). Berlin: Springer.

Guerard, J. B. (2013). Regression analysis and forecasting models. In *Introduction to Financial Forecasting in Investment Analysis* (pp. 19-45). Springer, New York, NY.

Gelman, A., Hill, J., & Vehtari, A. (2020). *Regression and other stories*. Cambridge University Press.

Harjoto, M., Jo, H., & Kim, Y. (2017). Is institutional ownership related to corporate social responsibility? The nonlinear relation and its implication for stock return volatility. *Journal of Business Ethics*, *146*(1), 77-109.

Hashemijoo, M., Ardekani, A.M., & Younesi, N. (2012). The impact of dividend policy on share price volatility in the Malaysian Stock Market. *Journal of Business Studies Quarterly*, 4(1), 111- 129.

Hsiao, C. (2022). *Analysis of panel data*. Cambridge university press.

Hunjra, A. I., Ijaz, M., Chani, D., Irfan, M., & Mustafa, U. (2014). Impact of dividend policy, earning per share, return on equity, profit after tax on stock prices. *Hunjra, AI, Ijaz, M. S, Chani, MI, Hassan, S.*

and Mustafa, U.(2014). Impact of Dividend Policy, Earning per Share, Return on Equity, Profit after Tax on Stock Prices. International Journal of Economics and Empirical Research, *2*(3), 109-115.

Islam, T., & Erum, T. O. O. R. (2019). Power comparison of autocorrelation tests in dynamic models. *International Econometric Review*, *11*(2), 58-69.

Jafarinejad, M., Jory, S.R., & Ngo, T.N. (2015). The effects of institutional ownership on the value and risk of diversified firms. *International Review of Financial Analysis*, *40*, 207-219.

Jihadi, m., vilantika, e., hashemi, s. m., arifin, z., bachtiar, y., & Sholichah, F. (2021). The effect of liquidity, leverage, and profitability on firm value: Empirical evidence from Indonesia. *The Journal of Asian Finance, Economics and Business*, *8*(3), 423-431.

Kachchhy, U. (2015). Accounting Information and Stock Price Reaction of Listed Companies—Empirical Evidence From All Listed Companies From NSE in Power Genration and Distribution Sector. *Indian Journal PARIPEX*, *4*(5).

Kadim, A., Sunardi, N., & Husain, T. (2020). The modeling firm's value based on financial ratios, intellectual capital and dividend policy. *Accounting*, *6*(5), 859-870.

Khatun, N. (2021). Applications of normality test in statistical analysis. *Open Journal of Statistics*, *11*(01), 113.

Kibiya, I. U., Aminu, B. S., & Abubakar, K. S. (2019). The Moderating Effect of Institutional Ownership on Intellectual Capital and Financial Performance of Listed Conglomerates. *SEISENSE Journal of Management*, *2*(5), 20–28.

Kočenda, E., & Černý, A. (2015). *Elements of time series econometrics: An applied approach*. Charles University in Prague, Karolinum Press.

Koutmos, D. (2018). Return and volatility spillovers among cryptocurrencies. *Economics Letters*, *173*, 122-127.

Kumari, J., & Mahakud, J. (2016). Investor sentiment and stock market volatility: Evidence from India. *Journal of Asia-Pacific Business*, *17*(2), 173-202.

Larcker, D. F., Ormazabal, G., & Taylor, D. J. (2011). The market reaction to corporate governance regulation. *Journal of financial economics*, *101*(2), 431-448.

Li, D., Liu, E., & Li, Y. (2022). Macroeconomic News and Risk Exposure to Foreign Exchange Rate Evidence from Chinese Listed Firms. *Emerging Markets Finance and Trade*, 1-20.

Lim, D. S., Morse, E. A., & Yu, N. (2020). The impact of the global crisis on the growth of SMEs: A resource system perspective. *International Small Business Journal*, *38*(6), 492-503.

Lin, Y., Fu, X., Gu, X., & Song, H. (2018). Institutional ownership and return volatility in the casino industry. *International Journal of Tourism Research*, *20*(2), 204-214.

Ma, Y., Ma, B., Jiao, H., Zhang, Y., Xin, J., & YuS, Z. (2020). An analysis of the effects of weather and air pollution on tropospheric ozone using a generalized additive model in Western China: Lanzhou, Gansu. *Atmospheric Environment*, *224*, 117342.

Marangu, K., & Jagongo, A. (2014). Price to book value ratio and financial statement variables (An empirical study of companies quoted at Nairobi securities exchange, Kenya). *Global Journal of Commerce & Management Perspective*, *3*(6), 50-56.

Maringa, E. K., Riro, G. K., & Kiarie, D. (2018). Market reaction to dividend announcements: Analysis at Nairobi securities exchange. *International Journal of Finance and Accounting*, *3*(1), 48-65.

Martelli, J., & Greener, S. (2018). An introduction to business research methods. Ventus Publishing.

McMillan, D.G. (2019). Stock return predictability: Using the cyclical component of the price ratio. *Research in International Business and Finance*, *48*, 228-242.

Memon, M.A., Cheah, J.H., Ramayah, T., Ting, H., Chuah, F., & Cham, T.H. (2019). Moderation analysis: issues and guidelines. *Journal of Applied Structural Equation Modeling*, *3*(1), i-xi.

Mensi, W., Hamdi, A., & Yoon, S. M. (2018). Modelling multifractality and efficiency of GCC stock markets using the MF-DFA approach: A comparative analysis of global, regional and Islamic markets. *Physica A: Statistical Mechanics and its Applications*, *503*, 1107-1116.

Nathrah, M. Y. (2016). *The determinants of stock market volatility: Macroeconomic fundamentals and investor sentimen*t, (Doctoral dissertation, University of Malaya).

Ndwiga, D., & Muriu, P.W. (2016). Stock Returns and Volatility İn an Emerging Equity Market. Evidence from Kenya. *European Scientific Journal, ESJ*, *12*(4), 79.

Ni, W. (2017). Research on ownership structure and stock price fluctuation. In *2017 7th International Conference on Education, Management, Computer and Society (EMCS 2017)* (pp. 438-442). Atlantis Press.

Omollo, B. A., Muturi, W. M., & Wanjare, J. (2018). Effect of Debt Financing Options on Financial Performance of Firms Listed at the Nairobi Securities Exchange, Kenya. *Research Journal of Finance and Accounting*, *9*(10), 150-164.

O'Sullivan, P. (2018). The capital asset pricing model and the efficient markets hypothesis: The compelling fairy tale of contemporary financial economics. *International Journal of Political Economy*, *47*(3-4), 225-252.

Osundina, J.A., Jayeoba, O.O., & Olayinka, I.M. (2016). Impact of market value ratios on stock price volatility (a study of selected quoted manufacturing companies in Nigeria). *International Journal of Business and Management Invention*, *5*(11), 41-54.

Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, *60*(1), 13-50.

Paździor, A., & Paździor, M. (2018). Determinants of Changes in Stock Market Prices Based on Companies in the WIG-INFO Index. *Zeszyty Naukowe Wyższej Szkoły Bankowej w Poznaniu*, *79*, 155-163.

Pelcher, L., & Bolton, J. (2021). Dividend Policy, Stock Price Volatility And Wealth Maximization For AltX Listed Companies In Developing Economies. *Journal of Global Business & Technology*, *17*(1).

Peress, J., & Schmidt, D. (2020). Glued to the TV: Distracted noise traders and stock market liquidity. *The Journal of Finance*, *75*(2), 1083-1133.

Potter, G. (1992). Accounting earnings announcements, institutional investor concentration, and common stock returns. *Journal of Accounting Research*, *30*(1), 146-155.

Rubin, A., & Smith, D. R. (2009). Institutional ownership, volatility and dividends. *Journal of Banking & Finance*, *33*(4), 627-639.

Rupande, L., Muguto, H. T., & Muzindutsi, P. F. (2019). Investor sentiment and stock return volatility: Evidence from the Johannesburg Stock Exchange. *Cogent Economics & Finance*, 7(1), 1600233.

Samy, M., & Robertson, F. (2017). *From positivism to social constructivism: an emerging trend for CSR researchers.* In Handbook of research methods in corporate social responsibility. Edward Elgar Publishing.

Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation coefficients: appropriate use and interpretation. *Anesthesia & Analgesia*, *126*(5), 1763-1768.

Sewpersadh, N. S. (2019). An examination of CEO power with board vigilance as a catalyst for firm growth in South Africa. *Measuring Business Excellence*.

Serra, R. G., & Fávero, L. P. L. (2018). Multiples' valuation: the selection of cross-border comparable firms. *Emerging Markets Finance and Trade*, *54*(9), 1973-1992.

Shrestha, N. (2020). Detecting multicollinearity in regression analysis. *American Journal of Applied Mathematics and Statistics*, *8*(2), 39-42.

Silwal, P. P., & Napit, S. (2019). Fundamentals of Stock Price in Nepalese commercial banks. *International Research Journal of Management Science*, *4*, 83-98.

Singh, A. & Kansil, R. (2018). Institutional ownership and firm performance: evidence from Indian panel data. *International Journal of Business and Emerging Markets*. 10. 250. 10.1504/IJBEM.2018.10013055.

Stanišić, n., & Janković, n. (2022). Exchange rates and purchasing power parity: the case of Central European. *Foreign trade: Economics, Finance, Law*, *121*(2), 96-106.

Tasnia, M., AlHabshi, S. M. S. J., & Rosman, R. (2020). The impact of corporate social responsibility on stock price volatility of the US banks: A moderating role of tax. *Journal of Financial Reporting and Accounting*.

Thanatawee, Y. (2021). The impact of foreign ownership on stock price volatility: Evidence from Thailand. *Journal of Asian Finance, Economics and Business*, *8*(1), 007-014.

Varoquaux, G. (2018). Cross-validation failure: small sample sizes lead to large error bars. *Neuroimage*, 180, 68-77.

Vutale, A. V., & Chen, B. The Effects of Dividend Policy on Market Share Price of the Listed Companies at the Nairobi Securities Exchange (NSE) in Kenya.

Wagle, S. (2021). Determinant of Stock Market Prices in Nepal: A Case of Commercial Banks. *SDMIMD Journal of Management*, *12*(2), 1-9.

Wang, C., Li, Z., Clay Mathews, M., Praharaj, S., Karna, B., & Solís, P. (2022). The spatial association of social vulnerability with COVID-19 prevalence in the contiguous United States. *International Journal of Environmental Health Research*, *32*(5), 1147-1154.

Zainudin, R., Mahdzan, N. S., & Yet, C. H. (2018). Dividend policy and stock price volatility of industrial products firms in Malaysia. *International Journal of Emerging Markets*.

Zhang, J., Zhang, K., & Zhao, F. (2020). Research on the regional spatial effects of green development and environmental governance in China based on a spatial autocorrelation model. *Structural Change and Economic Dynamics*, *55*, 1-11.