CHAPTER 5

ANALYSIS AND FINDINGS

5.1 Introduction

This chapter firstly investigates the effects of accounting and market indicators on company performance. Secondly, its identifies the accounting and market indicators that can discriminate between performing and underperforming companies. It also ranks the sample firms according to their discriminate scores. Finally, it examines the mediating effect of stock volatility on the relationships between accounting and market indicators and company performance. The chapter consists of three sections: the first section presents the statistical results. Section two presents the empirical results and hypothesis testing. The final section concludes a discussion of some remarks.

5.2 Diagnostic Analysis

This section consists of fifth subsections. The first shows the summarised dataset; the second the descriptive statistics; the third multicollinearity test; the fourth validity test; and the last the sensitivity test.

5.2.1 Data Summary

Table 5.1 shows the characteristics of the summarised dataset. The dataset was strongly balanced and there were no missing data. Accordingly, it was found to be suitable and valid for analyses.

Table 5.1: Dataset Summary

Panel Variable	Strongly Balanced
Time Variable	Year, 2008 to 2018
Sample	63
Delta	1 Year
Missing	——

The ASE consists of three main sectors: financial, industrial, and services. Each sector is divided into several groups because of their different operating activities. Thus, financial treatments and accounting reports differ between sectors or groups. Accordingly, only indicators common to all sample firms were selected. Data available in all firms were included in the analysis. A sensitivity analysis was conducted to reveal any differences within the study data.

5.2.2 Descriptive Statistics

The descriptive statistics covered a sample of 63 ASE Index companies from 2008 to 2018. A total of 693 observations were recorded for each variable. Table 5.2 reports the most important descriptive statistics for the variables: mean, standard deviation, minimum, and maximum.

Table 5.2: Descriptive Statistics

No.	Variables	Obs.	Mean	Std. Dev.	Min	Max
1	**Stock Price (P)**	693	2.480274	4.640891	0.09	46.51
2	**Return (R)**	693	-0.038597	0.3475136	-0.6875	4.3077
3	**Return on Assets (ROA)**	693	2.398505	7.298348	-40.4075	43.9401
4	**Return on Equity (ROE)**	693	7.560404	74.13015	-122.725	1924.733
5	**Net Profit Margin (NPM)**	693	-22.11017	658.4569	-16005.03	3865.838
6	**Current Ratio (CR)**	693	4.233959	9.909549	0.0138	146.0319
7	**Debt Ratio (DR)**	693	38.40584	29.69169	0.3813	98.3078
8	**Total Assets Turnover (TOA)**	693	1.198375	1.659003	-0.3074	6.0433
9	**Market Capitalisation (MC)**	693	31.78376	95.73868	0.1441	1369.802
10	**Stock Turnover Ratio (STR)**	693	86.1015	228.9376	0.1009	2454.68
11	**Earnings Per Share (EPS)**	693	0.1490179	0.3809469	-1.0766	3.7374
12	**Book Value Per Share (BPS)**	693	1.825573	1.704362	-0.0307	12.1843
13	**Price Earnings Ratio (PER)**	693	11.81	194.5274	-2680.18	1793.59
14	**Price-to-book Value (PBV)**	693	1.401107	4.87881	-20.2281	88.4854

The average stock price of the sample was JOD 2.48, with a standard deviation of JOD 4.64. The minimum stock price was JOD 0.09, while the maximum was JOD 46.51. There appears to be a substantial gap between the highest and lowest stock prices. There were companies with high stock prices, though the opposite was also true. Considering the nature of stock market and business, fluctuating stock prices is normal.

Table 5.2 also shows that the average return of the sample was -0.038 percent, with a standard deviation of 0.35 percent. The minimum return was -0.69 percent, while the maximum was 4.31 percent. These showed that some companies were able to

generate high returns, while others did not. The profitability indicators were satisfactory though a bit low, as there were companies with negative net profit margin (NPM). However, the ROA and ROE were satisfactory. Their respective means were 2.39 and 7.56.

There were two solvency indicators, current ratio (CR) and debt ratio (DR). The CR was more than 1, indicating that the overall liquidity of the companies was good. In addition, the DR was satisfactory (M = 38.41). Total assets turnover (TOA) is the most common indicator published in the annual report of the companies; it indicates the overall efficiency of an organisation. The overall TOA was 1.19. While above 1, the value was still a bit low. Nonetheless, the overall solvency indicators were satisfactory.

The average market capitalisation (MC) of the sample companies was JOD 31.78 million. The current stock price and number of outstanding stocks differed from a company to another, as reflected by the standard deviation (SD = JOD 95.74 million). This is quite normal for the ASE Index, as it comprises large- and small-cap companies, whose stock prices constantly fluctuate over time.

The overall valuation indicators were satisfactory. The average stock turnover ratio (STR) was 86.10, indicating that the shares of the companies were liquid. The book value per share (BPS) and price-to-book value (PBV) had respective means of 1.83 and 1.40. The price-earnings ratio (PER) reflects the current share price relative to its per-share earnings; the figure here was satisfactory (M = 11.81). The average earnings per share (EPS) was JOD 0.15, which was rather low. This indicates that the companies gained low profits throughout the study period.

5.2.3 Multicollinearity Test

The variance inflation factor (VIF) and tolerance (1/VIF) are typically used to identify multicollinearity problems. VIF measures the degree to which each independent variable is explained by other independent variables. A VIF score of more than 10 and 1/VIF value of higher than one signal the presence of multicollinearity (Gujarati, 2004). The results of the tests are summarised in Table 5.3.

Table 5.3: Multicollinearity Test

Variables	VIF	1/VIF
Return on Assets (ROA)	2.22	0.450858
Return on Equity (ROE)	1.06	0.946985
Net Profit Margin (NPM)	1.06	0.946221
Current Ratio (CR)	1.30	0.766888
Debt Ratio (DR)	4.01	0.249119
Total Assets Turnover (TOA)	3.42	0.292320
Market Capitalisation (MC)	1.31	0.764215
Stock Turnover Ratio (STR)	1.27	0.787424
Earnings Per Share (EPS)	3.50	0.285533
Book Value Per Share (BPS)	1.98	0.505336
Price Earnings Ratio (PER)	1.01	0.994618
Price-to-book Value (PBV)	1.09	0.919916
Mean	**1.94**	**0.66**

The mean VIF for all variables was 1.94, ranging between 1.01 and 4.01. In addition, the tolerance values ranged between 0.25 and 0.99, and their mean was 0.66. These results suggested the absence of multicollinearity.

5.2.4 Validity Test

The validity of the dataset was evaluated using Pearson's correlation. Table 5.4 describes in detail the correlations between all explanatory variables. The variables should be minimally correlated with each other. The table shows that the correlations between the independent variables were weak.

Table 5.4: Pearson Correlation between the Explanatory Variables

Var.	ROA	ROE	NPM	CR	DR	TOA	MC	STR	EPS	BPS	PER	PBV
ROA	1.00											
Sig.												
ROE	0.02	1.00										
Sig.	0.59											
NPM	0.15	0.02	1.00									
Sig.	0.01	0.62										
CR	-0.01	-0.03	-0.17	1.00								
Sig.	0.02	0.41	0.05									
DR	-0.08	0.11	0.06	-0.37	1.00							
Sig.	0.04	0.05	0.11	0.00								
TOA	0.03	0.03	0.05	-0.22	0.82	1.00						
Sig.	0.51	0.41	0.20	0.30	0.00							
MC	0.14	0.01	0.01	-0.07	0.12	0.77	1.00					
Sig.	0.02	0.77	0.71	0.08	0.01	0.01						
STR	-0.09	-0.04	0.00	0.05	-0.21	-0.19	0.31	1.00				
Sig.	0.01	0.36	0.94	0.89	0.00	0.00	0.00					
EPS	0.68	0.04	0.05	-0.07	0.10	0.19	0.29	-0.12	1.00			
Sig.	0.00	0.36	0.17	0.07	0.01	0.00	0.00	0.09				
BPS	0.33	0.01	0.04	-0.07	0.12	0.21	0.19	-0.12	0.67	1.00		
Sig.	0.00	0.77	0.26	0.06	0.01	0.00	0.00	0.07	0.00			
PER	0.04	0.01	0.01	-0.04	0.03	0.02	-0.00	-0.04	0.01	0.01	1.00	
Sig.	0.32	0.82	0.85	0.34	0.37	0.62	0.93	0.36	0.73	0.79		
PBV	0.12	-0.15	0.03	0.13	-0.01	-0.02	0.08	0.09	0.09	0.03	-0.02	1.00
Sig.	0.01	0.01	0.40	0.05	0.77	0.64	0.33	0.20	0.09	0.40	0.63	

ROA positively correlated with ROE, but it was not statistically significant. ROA was positively and significantly correlated with NPM, which itself was positively but

non-significantly correlated with ROE. In addition, CR was negatively and significantly correlated with DR and TOA. DR was positively and significantly correlated with TOA, whereas TOA correlated negatively but non-significantly with CR.

MC was significantly and positively correlated with STR, EPS, and BPS. STR was negatively but non-significantly correlated with EPS and BPS. EPS was positively and significantly correlated with BPS. The non-significant correlations reflected the overlap of indicators that guide investors. Determining the contribution of each variable in predicting company performance is important to guide their decisions.

The correlations were low, as they should be. Positive and significant relationships have been detected between some explanatory variables. These are normal since they were computed using the same figures. Therefore, the data of the study is valid to use in the multivariate analysis. Nonetheless, the study have substantiated these conclusions with other robustness tests.

5.2.5 Sensitivity Test

Crosstabulation is typically used to assess the sensitivity of the dependent variable values within the values of independent variables. The results shown in Table 5.5 indicated that the values of all independent variables did not vary within the values of the two dependent variables (price and return). Thus, the data of the selected variables did not vary between the industries or operating activities of the sample. This is also shown in the results of the descriptive statistics: the differences between firms' data were minimum.

Table 5.5: Crosstabs Test

Case Processing Summary						
Price Model						
Dependent * Independent	**Valid**		**Varied**		**Total**	
	N	**Percent**	**N**	**Percent**	**N**	**Percent**
PR * ROA	693	100.0%	0	0.0%	693	100.0%
PR * ROE	693	100.0%	0	0.0%	693	100.0%
PR * NPM	693	100.0%	0	0.0%	693	100.0%
PR * DR	693	100.0%	0	0.0%	693	100.0%
PR * CR	693	100.0%	0	0.0%	693	100.0%
PR * TOA	693	100.0%	0	0.0%	693	100.0%
PR * MC	693	100.0%	0	0.0%	693	100.0%
PR * STR	693	100.0%	0	0.0%	693	100.0%
PR * EPS	693	100.0%	0	0.0%	693	100.0%
PR * BPS	693	100.0%	0	0.0%	693	100.0%
PR * PER	693	100.0%	0	0.0%	693	100.0%
PR * PBV	693	100.0%	0	0.0%	693	100.0%
Return Model						
R * ROA	693	100.0%	0	0.0%	693	100.0%
R * ROE	693	100.0%	0	0.0%	693	100.0%
R * NPM	693	100.0%	0	0.0%	693	100.0%
R * DR	693	100.0%	0	0.0%	693	100.0%
R * CR	693	100.0%	0	0.0%	693	100.0%
R * TOA	693	100.0%	0	0.0%	693	100.0%
R * MC	693	100.0%	0	0.0%	693	100.0%
R * STR	693	100.0%	0	0.0%	693	100.0%
R * EPS	693	100.0%	0	0.0%	693	100.0%
R * BPS	693	100.0%	0	0.0%	693	100.0%
R * PER	693	100.0%	0	0.0%	693	100.0%
R * PBV	693	100.0%	0	0.0%	693	100.0%

The statistical analysis showed that the data of the selected variables conformed to the assumptions of the regression analysis. The following sections present the empirical results of the study to accomplish the research objectives.

5.3 Empirical Results

The empirical results of the study consist four main analyses. The first shows the regression analysis estimations of stock price and return; the second the discriminant analysis; the third the volatility measurement; and the last the mediation analysis of the volatility of stock price and return.

5.3.1 Stock Price Regression

The results of the pooled OLS model are first presented. The robustness test of regression is estimated. They will be followed by the results of the fixed and random effects generalised least squares (GLS) models. The Breuch-Pagan test was carried out to detect heteroskedasticity. The most appropriate models to test the first hypotheses were also identified.

5.3.1.1 Pooled OLS Regression

Pooled OLS regression was conducted to investigate the effect of accounting and market indicators on companies' performance. Table 5.6 reports the pooled OLS regression results for the static stock price model. The model was used to test the effects of the 12 indicators on stock price. The results showed the model was a good fit for the data, $F(12, 680) = 215.72$, and was able to explain much of the variance in the dependent variable ($R^2 = 0.79$). This pooled regression model assumes that all 63 companies are identical, even though they are actually heterogenous in size, activity, and sector. Therefore, for the time being, the results of this model shall not be accepted. To account for the heterogeneity of the sample, two GLS models were first estimated to allow the researcher to choose an appropriate empirical model to test the first hypotheses.

Table 5.6: Pooled Estimation Result of the Price (OLS)

$$P_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$$

Var. Reg. Stock Price (P)	Coefficient	Std. Err.	T-Test	P> |T-Test|
Return On Asset (ROA)	0.0891437	0.0165642	5.38	0.000***
Return On Equity (ROE)	0.0020527	0.0011253	1.82	0.069*
Net Profit Margin (NPM)	-0.0000159	0.0001267	-0.13	0.900
Current Ratio (CR)	-0.0077067	0.009354	-0.82	0.410
Debt Ratio (DR)	0.0087498	0.0054774	1.60	0.111
Total Asset Turnover (TOA)	-0.3975704	0.090498	-4.39	0.000***
Market Capitalisation (MC)	0.00869	0.000970	0.90	0.371
Stock Turnover Ratio (STR)	0.000239	0.0003996	0.60	0.005***
Earnings Per Share (EPS)	8.725592	0.3987705	21.88	0.000***
Book Value Per Share (BPS)	0.9114778	0.0669983	13.60	0.000***
Price Earnings Ratio (PER)	-0.0000191	0.0004184	-0.05	0.964
Price-to-book Value (PBV)	0.0472762	0.0173471	2.73	0.007***
_Cons	-0.1860584	0.2176132	-0.85	0.393
Model				
Number of observations = 693		**Number of Variables = 12**		
F (12, 680) = 215.72		**Prob > F = 0.0000**		
R-squared = 0.7920		**Adj R-squared = 0.7883**		

***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant at the 10% level.**

According to the findings reported in Table 5.6, ROA, TOA, STR, EPS, BPS, and PBV had a statistically significant impact on stock price. ROE had a marginally significant impact on stock price. The results also show that NPM, CR, DR, MC, and PER did not have any statistically significant impact on stock price. Nonetheless, the following analysis presents the results of the robustness test of pooled regression of stock price model.

5.3.1.2 Robustness Test of Regression

Robustness test of regression was conducted to ensure the durability of the model. Table 5.7 presents the results of the robustness test of stock price regression model.

Table 5.7: Robustness Test of Stock Price

$P_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$				
Variables Regression of Stock Price (P)	**Coefficient**	**Robust Std. Err.**	**T-Test**	**P> |T-Test|**
Return On Asset (ROA)	0.0891437	0.0347587	2.56	0.011**
Return On Equity (ROE)	0.0020527	0.0004197	4.89	0.058*
Net Profit Margin (NPM)	-0.0000159	0.000031	-0.51	0.607
Current Ratio (CR)	-0.0077067	0.0066031	-1.17	0.244
Debt Ratio (DR)	0.0087498	0.0053993	1.62	0.106
Total Asset Turnover (TOA)	-0.3975704	0.0962657	-4.13	0.000***
Market Capitalisation (MC)	0.00869	0.000288	0.30	0.763
Stock Turnover Ratio (STR)	0.000239	0.0004344	0.55	0.002***
Earnings Per Share (EPS)	8.725592	1.737681	5.02	0.000***
Book Value Per Share (BPS)	0.9114778	0.1690893	5.39	0.000***
Price Earnings Ratio (PER)	-0.0000191	0.0001849	-0.10	0.918
Price-to-book Value (PBV)	0.0472762	0.0252518	1.87	0.032**
_Cons	-0.1860584	0.2255728	-0.82	0.410
Model				
Number of observations = 693		**Number of Variables = 12**		
F (12, 680) = 44.11		**Prob > F = 0.0000**		
R-squared = 0.7920		**Adj R-squared = 0.7883**		
***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant at the 10% level.**				

The estimations show that the coefficients of variables had no differences from the pooled OLS model. The standard error had little difference after running a robust standard error regression. This can generally be translated by a little difference of t-value and the power of significant level. That is, the model is robust. Nonetheless, the study will substantiate these conclusions with other robustness tests such as Hausman and Breuch-Pagan tests. The following section presents the panel data analysis (GLS).

5.3.1.3 Panel GLS Regression

Panel data analysis (GLS) contains two main analyses: fixed and random. The following sections present the results of both.

A. Fixed Effects Regression

Table 5.8 presents the results of the fixed effects GLS model. The estimations had little difference from the pooled OLS model.

Table 5.8: Fixed Effects Estimation for the Price

$P_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$

Var. Reg. Stock Price (P)	Coefficient	Std. Err.	T-Test	P> |T-Test|
Return on Asset (ROA)	0.0809066	0.016483	4.91	0.000***
Return on Equity (ROE)	0.0006808	0.0009458	0.72	0.472
Net Profit Margin (NPM)	0.0000126	0.0001044	0.12	0.904
Current Ratio (CR)	-0.0034275	0.0090924	-0.38	0.706
Debt Ratio (DR)	0.004341	0.0083696	0.52	0.604
Total Asset Turnover (TOA)	-0.1544205	0.2358711	-0.65	0.513
Market Capitalisation (MC)	0.00497	0.000922	5.40	0.000***
Stock Turnover Ratio (STR)	0.0006028	0.0004951	1.22	0.004***
Earnings Per Share (EPS)	5.935909	0.3773176	15.73	0.000***
Book Value Per Share (BPS)	0.7782848	0.1928484	4.04	0.000***
Price Earnings Ratio (PER)	-0.0000469	0.000344	-0.14	0.892
Price-to-book Value (PBV)	0.0276233	0.0147415	1.87	0.061*
_Cons	0.2525681	0.5516249	0.46	0.647
Model				
Number of observations = 693		**Number of Variables = 12**		
F (12, 680) = 36.53		**Prob > F = 0.0000**		
R-squared = 0.7741				

***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant at the 10% level.**

According to the findings reported in Table 5.8, ROA, MC, STR, EPS, and BPS had a statistically significant impact on stock price. The random effects results are introduced in the following section. PBV had a marginally significant impact on stock

price. The results also show that ROE, NPM, CR, DR, TOA, and PER did not have any statistically significant impact on stock price.

B. Random Effects Regression

Table 5.9 presents the results of the random effects GLS stock price model. There were some differences in the results compared to the previous two models. Accordingly, the Hausman test was carried out to choose the most appropriate model.

Table 5.9: Random Effects Estimation of the Price

$P_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$				
Var. Reg. Stock Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return on Asset (ROA)	0.0838346	0.0160881	5.21	0.000***
Return on Equity (ROE)	0.001323	0.000978	1.35	0.176
Net Profit Margin (NPM)	0.00000268	0.0001097	0.02	0.981
Current Ratio (CR)	-0.0054242	0.0090371	-0.60	0.548
Debt Ratio (DR)	0.0060453	0.0064494	0.94	0.349
Total Asset Turnover (TOA)	-0.3329324	0.1182534	-2.82	0.005***
Market Capitalisation (MC)	0.00394	0.000894	4.41	0.000***
Stock Turnover Ratio (STR)	0.0006055	0.0004403	1.38	0.009***
Earnings Per Share (EPS)	6.955271	0.3766876	18.46	0.000***
Book Value Per Share (BPS)	1.080341	0.084751	12.75	0.000***
Price Earnings Ratio (PER)	-0.0000379	0.0003612	-0.10	0.916
Price-to-book Value (PBV)	0.0339019	0.0153478	2.21	0.027**
_Cons	-0.2676862	0.2747045	-0.97	0.330
Model				
Number of observations = 693		**Number of Variables = 12**		
Wald chi2 (12) = 121.511		**Prob > chi2 = 0.0000**		
R^2 = 0.7828				
***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant at the 10% level.**				

According to the findings reported in Table 5.9, ROA, TOA, MC, STR, EPS, BPS, and PBV had a statistically significant impact on stock price. The results also show that ROE, NPM, CR, DR, and PER did not have any statistically significant impact on stock price.

The findings of GLS showed that the estimations of fixed effects had little difference from the random effects. However, to differentiate between the random and fixed effects, the current study conducts Hausman's test to select the appropriate model. The finding of Hausman's test presented as follow.

5.3.1.4 Hausman Test of GLS Regression

The findings of the Hausman test for the robustness of stock price model are presented in Table 5.10. The null hypothesis states that the random effects model is appropriate, whereas the alternative hypothesis claims that the fixed effects model is appropriate.

Table 5.10: Hausman Test Results of the Price

Variables	Coefficients		Difference
	Fixed (b)	Random (B)	(b-B)
Return on Asset (ROA)	0.0809066	0.0838346	-0.002928
Return on Equity (ROE)	0.0006808	0.001323	-0.0006423
Net Profit Margin (NPM)	0.0000126	0.00000268	0.00000997
Current Ratio (CR)	-0.0034275	-0.0054242	0.0019967
Debt Ratio (DR)	0.004341	0.0060453	-0.0017044
Total Asset Turnover (TOA)	-0.1544205	-0.3329324	0.1785119
Market Capitalisation (MC)	0.00497	0.00394	0.00103
Stock Turnover Ratio (STR)	0.0006028	0.0006055	-0.0000027
Earnings Per Share (EPS)	5.935909	6.955271	-1.019362
Book Value Per Share (BPS)	0.7782848	1.080341	-0.3020565
Price Earnings Ratio (PER)	-0.0000469	-0.0000379	-0.00000902
Price-to-book Value (PBV)	0.0276233	0.0339019	-0.0062786
Chi2 = 41.9978			
Prob > chi2 = 1.0000			

As the table shows, the probability was larger than 5 percent. Therefore, the null hypothesis was accepted, suggesting that the random effects model was more

appropriate. Before testing the hypothesis, the following test was conducted to identify heteroskedasticity.

5.3.1.5 Heteroskedasticity Test

Heteroskedasticity test was conducted using Breusch-Pagan test. Table 5.11 shows the results of the Breusch-Pagan test. This test regresses the residuals; its null hypothesis states that the variances of the residuals are homogeneous or equal.

Table 5.11: Breuch-Pagan Test of the Price

H_0: Constant variance **Variables: SP - ROA, ROE, NPM, CR, DR, TOA, MC, STR, EPS, BPS, PER, PBV.**		
Model	**Chi2 (12)**	**Prob > Chi2**
p	30.05	0.0000

The findings of Breusch-Pagan test indicates that heteroskedasticity was found in the model, $\chi^2 = 30.05$, $p < 0.05$. The variances of the residuals were heterogenous, and the null hypothesis was rejected. To minimise this issue, the data were analysed using the random effects feasible generalised least squares (FGLS) model as follow.

5.3.1.6 Feasible Generalised Least Squares Regression

As previously mentioned, the results of the Hausman test showed that the random effects model was the best fit for the data, while the Breusch-Pagan detected the heteroskedasticity problem. To correct this issue, the random effects panel FGLS was used to estimate the parameters, assuming a heteroskedastic and correlated error structure. The model provided the best estimation for the variables, and so the hypotheses were tested according to it. The findings of the FGLS model are presented in Table 5.12.

Table 5.12: Results of the FGLS Stock Price Model

$P_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$

Var. Reg. Stock Price (P)	Coefficient	Std. Err.	T-Test	P> |T-Test|
Return on Asset (ROA)	0.042564	0.0036811	11.56	0.000***
Return on Equity (ROE)	0.0010747	0.0008322	1.29	0.197
Net Profit Margin (NPM)	0.00000225	0.0000049	0.46	0.642
Current Ratio (CR)	0.0005903	0.0008412	0.70	0.483
Debt Ratio (DR)	0.0016911	0.0009915	1.71	0.088*
Total Asset Turnover (TOA)	-0.0865259	0.0177586	-4.87	0.000***
Market Capitalisation (MC)	0.00637	0.000473	13.47	0.000***
Stock Turnover Ratio (STR)	0.0003445	0.0000717	4.81	0.000***
Earnings Per Share (EPS)	4.545705	0.2646981	17.17	0.000***
Book Value Per Share (BPS)	0.731581	0.0311481	23.49	0.000***
Price Earnings Ratio (PER)	0.00000396	0.0000797	0.05	0.960
Price-to-book Value (PBV)	0.0004718	0.0018018	0.26	0.793
_Cons	-0.1138977	0.037893	-3.01	0.003
Model				
Number of observations = 693		**Number of Variables = 12**		
Wald chi2 (12) = 317.25		**Prob > chi2 = 0.0000**		
R^2 = 0.7828				

***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant at the 10% level.**

The FGLS model was a significant fit for the data, Wald $\chi^2 = 317.25$, $p < 0.05$. It was also able to explain much of the variance in the dependent variable ($R^2 = 78.28\%$). This model was therefore used to test the first sub-hypothesis, that accounting and market indicators significantly affect stock price.

According to the findings reported in Table 5.12, EPS had the highest positive coefficient on stock price (4.55), thus an increase in EPS leads to an increase in the stock price. EPS represents the company net income for each outstanding common stock. Normally, investors are interested in investments with a high EPS, which is reflected positively in the stock's price. This result confirms the hypothesis that

investors base their investing decision on EPS. This result is consistent with the findings of Susilawati and Suryaningsih (2020), Ligocká and Stavárek (2019), Haryanti and Murtiasih (2019), and Al-oshaibat and Al-manaseer (2018).

ROA had a statistically significant and positive impact on stock price, B = 0.043. ROA reflects a company's net income relative to its asset; it is an important indicator for investors in the financial markets. This result confirms the significance of ROA in predicting stock price: an increase in ROA leads to increase in stock price. This result is consistent with the findings of Dadrasmoghadam and Akbari (2015) and Tarmidi, Pramukty, and Akbar (2020).

MC had a statistically significant and positive impact on stock price, B = 0.01, indicating that an increase in MC predicts an increase in stock price. This result supports the fact that a company with the highest market value would have the highest stock price. BPS had a statistically significant and positive impact on stock price. Investors perhaps do not give much attention to the book value of shares. However, it had a strong correlation to the stock price, B = 0.73, meaning that an increase in BPS leads to an increase in stock price. In addition, STR had a statistically significant and positive impact on stock price, B = 0.00034, suggesting that investors may consider the companies' movements of inventories to make their investment decisions.

DR had a marginally significant and positive impact on stock price, B = 0.0017. The ratio reflects the amount of debt capital relative to equity capital. Logically, investors prefer low-debt investments. However, DR may be an indication for new investments, and so it may correlate positively with stock prices, as supported by this result. This result is consistent with the findings of Dadrasmoghadam and Akbari (2015), while opposite to the finding of Tarmidi, Pramukty, and Akbar (2020) and Susilawati and Suryaningsih (2020).

The findings also showed that TOA had a statistically significant and negative impact on stock price, B = -0.087. This means that the increase in TOA leads to a decrease in stock price. Normally, investors prefer high TOA investments, hence its positive reflection on price. The opposite was however found in the Amman Stock Exchange, perhaps because most ASE Index companies are from the services sector, which allows them to generate net incomes higher than their assets.

CR represents the ability of a company to cover its short-term liabilities with its assets. Intuitively, investors prefer investments with a high CR, which reflects positively on stock price. This result, however, was the opposite: no relationship was found between CR and stock price. This result is opposite to the finding of Dadrasmoghadam and Akbari (2015). Moreover, ROE and NPM also had no significant relationships with stock price. It is well known that when ROE increases, investors invest to get more profits. It seems that the investors in the ASE are not looking at the ROE. As the result, the impact of ROE did not reflect in the companies' stock price. This result is opposite to the finding of Tarmidi, Pramukty, and Akbar (2020).

PER measures a company's current stock price relative to its EPS. Surprisingly, the results show that PER did not have any statistically significant impact on stock price. Similarly, PBV also did not have a statistically significant effect on stock price. Both results can be explained by the nature of the ASE, which is a weak emerging market and overly sensitive to regional political events. The results may be normal for companies in the ASE Index due to the uncertainty of the Jordanian economy and the bankruptcy of many companies. In addition, the mentality of investors may have an important role in such outcomes.

The findings of the price model analysis verified the impact of accounting and market indicators on stock price. A total of three out of 6 accounting indicators were

found to predict stock price. Four out of 6 market indicators were also found to predict stock price. Current investors, especially traders, may be interested with these findings. But long-term investors are perhaps more interested in stock returns more than its prices. Another verification thus still remains, the impact of accounting and market indicators on stock return. The latter may be determined by indicators unlike those for stock price. Therefore, the following section explains the effects of accounting and market indicators on the stock return of ASE Index companies.

5.3.2 Stock Return Regression

The results of the pooled OLS model are first presented. They will be followed by the results of the fixed and random effects generalised least squares (GLS) models. The Breuch-Pagan test was carried out to detect heteroskedasticity. The most appropriate models to test the first hypotheses were also identified.

5.3.2.1 Pooled OLS Regression

Pooled OLS regression was conducted to investigate the effect of accounting and market indicators on companies' performance. Table 5.13 reports the pooled OLS regression results for the static stock return model. The results indicated that the model fit was statistically significant, $F(12, 680) = 3.39$, $p < 0.05$. The model explained only 5.65 percent of variance in stock return. Similar to the stock price model, the study carried out fixed and random effects GLS estimators, before choosing the appropriate model for hypothesis testing.

Table 5.13: Pooled Estimation Results of the Return (OLS)

$R_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$

Var. Reg. Stock Return (R)	Coefficient	Std. Err.	T-Test	P> |T-Test|
Return on Asset (ROA)	0.0080585	0.0026415	3.05	0.002***
Return on Equity (ROE)	-0.0000647	0.0001794	-0.36	0.718
Net Profit Margin (NPM)	0.00000299	0.0000202	0.15	0.882
Current Ratio (CR)	-0.0018173	0.0014917	-1.22	0.224
Debt Ratio (DR)	-0.0012737	0.0008735	-1.46	0.145
Total Asset Turnover (TOA)	0.0195891	0.0144316	1.36	0.175
Market Capitalisation (MC)	0.00157	0.000155	1.02	0. 130
Stock Turnover Ratio (STR)	0.0000588	0.0000637	0.92	0.000***
Earnings Per Share (EPS)	0.0433198	0.0635913	0.68	0.000***
Book Value Per Share (BPS)	-0.0252748	0.0106841	-2.37	0.018**
Price Earnings Ratio (PER)	-0.0000148	0.0000667	-0.22	0.824
Price-to-book Value (PBV)	0.0045435	0.0027663	1.64	0.101
_Cons	-0.0007907	0.0347024	-0.02	0.982
Model				
Number of observations = 693		**Number of Variables = 12**		
F (12, 680) = 3.39		**Prob > F = 0.0001**		
R-squared = 0.0565		**Adj R-squared = 0.0398**		

***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant (10%) level.**

According to the findings reported in Table 5.13, ROA, STR, EPS, and BPS had a statistically significant impact on stock return. The results also show that ROE, NPM, CR, DR, TOA, MC, PBV, and PER did not have any statistically significant impact on stock return. Nonetheless, the following analysis presents the results of the robustness test of pooled regression of stock return model.

5.3.2.2 Robustness Test of Regression

Robustness test of regression was conducted to ensure the durability of the model. Table 5.14 presents the results of the robustness test of stock return regression model.

Table 5.14: Robustness Test of Stock Return

$R_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$				
Variables Regression of Stock Return (R)	**Coefficient**	**Robust Std. Err.**	**T-Test**	**P> |T-Test|**
Return on Asset (ROA)	0.0080585	0.0037502	2.15	0.032**
Return on Equity (ROE)	-0.0000647	0.0000775	-0.84	0.404
Net Profit Margin (NPM)	0.00000299	0.0000112	0.27	0.790
Current Ratio (CR)	-0.0018173	0.0018754	-0.97	0.333
Debt Ratio (DR)	-0.0012737	0.0006849	-1.86	0.063
Total Asset Turnover (TOA)	0.0195891	0.0124783	1.57	0.117
Market Capitalisation (MC)	0.00157	0.000172	0.91	0.362
Stock Turnover Ratio (STR)	0.0000588	0.0000761	0.77	0.000***
Earnings Per Share (EPS)	0.0433198	0.0631697	0.69	0.000***
Book Value Per Share (BPS)	-0.0252748	0.0084058	-3.01	0.003***
Price Earnings Ratio (PER)	-0.0000148	0.0000572	-0.26	0.796
Price-to-book Value (PBV)	0.0045435	0.0050337	0.90	0.367
_Cons	-0.0007907	0.0327083	-0.02	0.981
Model				
Number of observations = 693		**Number of Variables = 12**		
F (12, 680) = 3.39		**Prob > F = 0.0001**		
R-squared = 0.0565		**Adj R-squared = 0.0398**		
****** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant (10%) level.***				

The estimations show that the coefficients of variables had no differences from the pooled OLS model. The standard error had little difference after running a robust standard error regression. This can generally be translated by a little difference of t-value and the power of significant level. That is, the model is robust. Nonetheless, the study will substantiate these conclusions with other robustness tests such as Hausman and Breuch-Pagan tests. The following section presents the panel data analysis (GLS).

5.3.2.3 Panel GLS Regression

Panel data analysis (GLS) contains two main analyses: fixed and random. The following sections present the results of both.

A. Fixed Effects Regression

Table 5.15 presents the fixed effects GLS estimation results. It is noted that the results are improved compared to the pooled OLS findings.

Table 5.15: Fixed Effects Estimation Results of the Return (GLS)

$R_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$

Var. Reg. Stock Return (R)	Coefficient	Std. Err.	T-Test	P> |T-Test|
Return on Asset (ROA)	0.0073966	0.0025105	2.95	0.003***
Return on Equity (ROE)	-0.0000776	0.00017	-0.00	0.996
Net Profit Margin (NPM)	-0.0000107	0.0000191	-0.56	0.576
Current Ratio (CR)	-0.0007117	0.0014146	-0.50	0.615
Debt Ratio (DR)	-0.0011782	0.0008242	-1.43	0.153
Total Asset Turnover (TOA)	0.0187005	0.0136263	1.37	0.170
Market Capitalisation (MC)	0.000429	0.000151	2.84	0.085*
Stock Turnover Ratio (STR)	0.0000618	0.0000604	1.02	0.017**
Earnings Per Share (EPS)	0.0771896	0.0602393	1.28	0.041**
Book Value Per Share (BPS)	-0.0331227	0.0101128	-3.28	0.001***
Price Earnings Ratio (PER)	-0.0000698	0.0000635	-1.10	0.273
Price-to-book Value (PBV)	0.0047969	0.0026469	1.81	0.070*
_Cons	-0.0065912	0.0327866	-0.20	0.841
Model				
Number of observations = 693		**Number of Variables = 12**		
F (12, 680) = 4.83		**Prob > F = 0.0000**		
R-squared = 0.0497				

***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant at the 10% level.**

According to the findings reported in Table 5.15, ROA, STR, EPS, and BPS had a statistically significant impact on stock price. MC and PBV had a marginally

significant impact on stock return. The results also show that ROE, NPM, CR, DR, TOA, and PER did not have any statistically significant impact on stock return.

B. Random Effects Regression

Table 5.16 presents the random effects GLS estimation results. The findings were also rather different to those of the pooled OLS and fixed effects models. The Hausman test was next used to choose the most appropriate model.

Table 5.16: Random Effects Estimation Results of the Return (GLS)

$R_{i,t} = \alpha_{i,t} + \beta 1 ROA_{i,t} + \beta 2 ROE_{i,t} + \beta 3 NPM_{i,t} + \beta 4\ CR_{i,t} + \beta 5\ DR_{i,t} + \beta 6\ TOA_{i,t} + \beta 7\ MC_{i,t} + \beta 8\ STR_{i,t} + \beta 9\ EPS_{i,t} + \beta 10\ BPS_{i,t} + \beta 11\ PER_{i,t} + \beta 12\ PBV_{i,t} + \varepsilon_{i,t}$

Var. Reg. Stock Return (R)	Coefficient	Std. Err.	T-Test	P> |T-Test|
Return on Asset (ROA)	0.0095771	0.0019948	4.80	0.000***
Return on Equity (ROE)	-0.0000859	0.0000991	-0.09	0.931
Net Profit Margin (NPM)	0.00000214	0.0000187	0.11	0.909
Current Ratio (CR)	-0.0007418	0.0011876	-0.62	0.532
Debt Ratio (DR)	-0.0012723	0.0006519	-1.95	0.049**
Total Asset Turnover (TOA)	0.0280723	0.0108825	2.58	0.010***
Market Capitalisation (MC)	0.0000548	0.0000141	0.39	0.697
Stock Turnover Ratio (STR)	0.0000427	0.000056	0.76	0.000***
Earnings Per Share (EPS)	0.009389	0.0467066	0.20	0.000***
Book Value Per Share (BPS)	-0.0144505	0.0081866	-1.77	0.078*
Price Earnings Ratio (PER)	-0.0000145	0.000047	-0.03	0.975
Price-to-book Value (PBV)	0.0053986	0.002536	2.13	0.033**
_Cons	-0.0564096	0.0261008	-2.16	0.031
Model				
Number of observations = 693		**Number of Variables = 12**		
Wald chi2 (12) = 306.89		**Prob > chi2 = 0.0000**		
R-squared = 0.0565				

***** Significantly different from zero at the 1% level. ** Significantly different from zero at the 5% level. * Marginally significant (10%) level.**

According to the findings reported in Table 5.16, ROA, DR, TOA, STR, EPS, and PBV had a statistically significant impact on stock price. BPS had a marginally significant impact on stock return. The results also show that ROE, NPM, CR, MC, and PER did not have any statistically significant impact on stock return.

The findings of GLS showed that the estimations of fixed effects had little difference from the random effects. However, to differentiate between the random and fixed effects, the current study conducts Hausman's test to select the appropriate model. The finding of Hausman's test presented as follow.

5.3.2.4 Hausman Test of GLS Regression

The findings of the Hausman test for the robustness of stock return model are presented in Table 5.17.

Table 5.17: Hausman Test Results of the Return

Variables	Coefficients		Difference
	Fixed (b)	Random (B)	(b-B)
Return on Asset (ROA)	0.0073966	0.0095771	-0.0021805
Return on Equity (ROE)	-0.0000776	-0.0000859	0.0000083
Net Profit Margin (NPM)	-0.0000107	0.00000214	-0.00001284
Current Ratio (CR)	-0.0007117	-0.0007418	0.0000301
Debt Ratio (DR)	-0.0011782	-0.0012723	0.0000941
Total Asset Turnover (TOA)	0.0187005	0.0280723	-0.0093718
Market Capitalisation (MC)	0.000429	0.0000548	0.0003742
Stock Turnover Ratio (STR)	0.0000618	0.0000427	0.0000191
Earnings Per Share (EPS)	0.0771896	0.009389	0.0678006
Book Value Per Share (BPS)	-0.0331227	-0.0144505	-0.0186722
Price Earnings Ratio (PER)	-0.0000698	-0.0000145	-0.0000553
Price-to-book Value (PBV)	0.0047969	0.0053986	-0.0006017
Chi2 = 37.16			
Prob > chi2 = 1.0000			

Since the probability was more than 5 percent, the null hypothesis was accepted. This means that the random effects model was more appropriate. The model was then tested for heteroskedasticity.

5.3.2.5 Heteroskedasticity Test

The findings are presented in Table 5.18. The Breuch-Pagan test indicated the absence of heteroskedasticity since $\chi^2 = 3.74$, $p > 0.05$. The test was not significant and the null hypothesis cannot be rejected, indicating that the variance of the residuals was homogeneous. As a result, the random effects GLS model was deemed the most appropriate estimator of stock return. Accordingly, the hypothesis, that accounting and market indicators significantly predict stock price and stock return, was also interpreted according to it.

Table 5.18: Breuch-Pagan Test of the Return

H_0: Constant variance **Variables: R - ROA, ROE, NPM, CR, DR, TOA, MC, STR, EPS, BPS, PER, PBV.**		
R - Model	**Chi2 (12)**	**Prob > Chi2**
R	3.74	0.530

According to the findings reported in Table 5.16, TOA had the highest positive coefficient on stock return, B = 0.028, thus an increase in TOA leads to an increase in stock return. Investors prefer investments with a high TOA. The result supports the fact that investors focus on a company's revenues more than its assets. Additionally, ROA had a statistically significant and positive effect on stock return, B = 0.0095. The results are consistent with economic theory. This result is consistent with the findings of Kai and Abdrahman (2018) and Musallam (2018).

EPS had a statistically significant and positive impact on stock return, B = 0.009. Higher EPS is preferable for investors. The result is consistent with the findings of Wijaya (2015), Din (2017), and Allozi and Obeidat (2016) .STR had a statistically significant and positive impact on stock return, B = 0.000043, meaning that investors are interested in the companies' movement of inventories. As a result, it is reflected in

the companies' returns. The results suggest that an increase in EPS and STR leads to an increase in stock return. Meanwhile, PBV had a statistically significant and positive impact on stock return, B = 0.005. The indicator is reflected in the stock returns of the sample companies.

The results also showed that DR had a significantly negative impact on stock return, B = -0.001. Investors typically prefer low debt firms. DR may also indicate new investments of a company. Based on the investor's mentality, DR could correlate either positively or negatively to stock returns. This result is opposite to the finding of Allozi and Obeidat (2016). In this study, DR was found to correlate negatively with stock return, supporting economic theory. BPS had a marginally significant and negative impact on stock return, B = -0.014. This result is consistent with the findings of Wijaya (2015).

Surprisingly, MC did not affect stock return, though it positively predicted stock price. Similarly, ROE, NPM, CR, and PER did not predict stock return. These may be due to the nature of the weak and volatile Jordan economy, exacerbated by crises in the neighbouring countries. This result is consistent with the findings of Allozi and Obeidat (2016) and Afrino and Masdupi (2019). In addition, the model explained only a small portion of variance in stock return (R^2 = 6%), three out of 6 accounting indicators and four out of 6 market indicators significantly predicted stock return.

The findings of the stock price and return models have extended the examination of how both variables react to the changes in the accounting and market indicators. The analysis has identified the most important financial indicators whose information is readily available to investors. There is also evidence that the indicators affecting company performance depends on the measure of performance itself. Not all accounting and market indicators that significantly predicted stock price were able to predict stock

return, and vice versa. These results evidenced the inconclusive relationships among variables. Even though the effects of overlapping indicators also differ in direction and magnitude, H_1 was accepted, the first research question was answered, and the first research objective was achieved. That is, the result has supported the EMH theory.

The study has developed a model to discriminate performing and underperforming companies using accounting and market indicators. This will be explained in the following section.

5.3.3 Discriminant Analysis

This part is divided to three main sections: performance measurement using Jensen's alpha, discrimination of performing and underperforming companies, and ranking the companies using Z-score.

5.3.3.1 Performance Measurement Using Jensen's Alpha

The study measures Jensen's alpha using CAPM to estimate the beta and alpha coefficients. The results are shown in Table 5.19 below. The performing companies were categorised as (1), while the underperforming companies as (0). Based on the results, 24 companies were considered performing and 39 underperforming. Performing companies constituted approximately 38.1 percent of the total sample, while underperforming firms 61.9 percent.

Table 5.19: Jensen's Alpha Regression Results

#	Company	Alpha	Beta	R_f	1-B	R_f (1-b)	Status	Category
1	**ARBK**	-0.0048	0.9870	0.0999	0.0130	0.0013	Under Performing	**0**
2	**THBK**	0.0009	0.1064	0.0999	0.8936	0.0892	Under Performing	**0**
3	**EXFB**	-0.0030	0.4579	0.0999	0.5421	0.0541	Under Performing	**0**
4	**BOJX**	0.0024	0.4566	0.0999	0.5434	0.0543	Under Performing	**0**
5	**AHLI**	-0.0031	0.6648	0.0999	0.3352	0.0335	Under Performing	**0**
6	**CABK**	-0.0014	0.7300	0.0999	0.2700	0.0270	Under Performing	**0**
7	**JOIB**	0.0022	0.9416	0.0999	0.0584	0.0058	Under Performing	**0**
8	**UBSI**	-0.0001	0.8131	0.0999	0.1869	0.0187	Under Performing	**0**
9	**JCBK**	-0.0054	0.4288	0.0999	0.5712	0.0570	Under Performing	**0**
10	**ABCO**	-0.0030	0.6341	0.0999	0.3659	0.0365	Under Performing	**0**
11	**INVB**	-0.0017	0.5053	0.0999	0.4947	0.0494	Under Performing	**0**
12	**JOKB**	-0.0036	0.6456	0.0999	0.3544	0.0354	Under Performing	**0**
13	**JIJC**	-0.0073	0.5872	0.0999	0.4128	0.0412	Under Performing	**0**
14	**TIIC**	0.0064	1.2870	0.0999	-0.2870	-0.0287	Performing	**1**
15	**FRST**	0.0085	1.6699	0.0999	-0.6699	-0.0669	Performing	**1**
16	**UINV**	0.0198	1.9116	0.0999	-0.9116	-0.0910	Performing	**1**
17	**FUTR**	-0.0027	0.9285	0.0999	0.0715	0.0071	Under Performing	**0**
18	**SANA**	0.0044	0.8596	0.0999	0.1404	0.0140	Under Performing	**0**
19	**JEIH**	0.0021	1.3207	0.0999	-0.3207	-0.0320	Performing	**1**
20	**AMAL**	0.0038	1.1703	0.0999	-0.1703	-0.0170	Performing	**1**
21	**AAFI**	0.0030	1.8081	0.0999	-0.8081	-0.0807	Performing	**1**

'Table 5.18, continued'

#	Company	Alpha	Beta	R_f	1-B	R_f (1-b)	Status	Category
22	**UCFI**	0.0008	1.2814	0.0999	-0.2814	-0.0281	Performing	**1**
23	**SABK**	0.0005	1.0829	0.0999	-0.0829	-0.0083	Performing	**1**
24	**ULDC**	0.0154	1.6462	0.0999	-0.6462	-0.0645	Performing	**1**
25	**JRCD**	-0.0055	0.7816	0.0999	0.2184	0.0218	Under Performing	**0**
26	**IDMC**	0.0154	2.1230	0.0999	-1.1230	-0.1121	Performing	**1**
27	**EMAR**	-0.0110	0.8430	0.0999	0.1570	0.0157	Under Performing	**0**
28	**ATTA**	0.0090	1.0480	0.0999	-0.0480	-0.0048	Performing	**1**
29	**COHO**	-0.0022	0.5643	0.0999	0.4357	0.0435	Under Performing	**0**
30	**AQAR**	0.0080	0.9339	0.0999	0.0661	0.0066	Performing	**1**
31	**JNTH**	0.0095	1.5090	0.0999	-0.5090	-0.0508	Performing	**1**
32	**PHNX**	-0.0010	1.1063	0.0999	-0.1063	-0.0106	Performing	**1**
33	**REDV**	0.0036	1.3311	0.0999	-0.3311	-0.0331	Performing	**1**
34	**DADI**	-0.0083	0.3784	0.0999	0.6216	0.0621	Under Performing	**0**
35	**MBED**	0.0059	0.5550	0.0999	0.4450	0.0444	Under Performing	**0**
36	**UMIC**	0.0072	0.5979	0.0999	0.4021	0.0401	Under Performing	**0**
37	**EICO**	0.0207	0.8821	0.0999	0.1179	0.0118	Performing	**1**
38	**APOT**	0.0057	1.5393	0.0999	-0.5393	-0.0538	Performing	**1**
39	**JOPH**	0.0067	2.2419	0.0999	-1.2419	-0.1240	Performing	**1**
40	**JOCM**	-0.0126	0.6158	0.0999	0.3842	0.0384	Under Performing	**0**
41	**JOST**	-0.0021	1.7537	0.0999	-0.7537	-0.0753	Performing	**1**
42	**AALU**	0.0056	0.0559	0.0999	0.9441	0.0943	Under Performing	**0**
43	**ASPMM**	0.0003	0.3800	0.0999	0.6200	0.0619	Under Performing	**0**
44	**UCIC**	-0.0043	0.5478	0.0999	0.4522	0.0452	Under Performing	**0**
45	**WIRE**	-0.0088	0.9599	0.0999	0.0401	0.0040	Under Performing	**0**
46	**JOWM**	-0.0040	0.4640	0.0999	0.5360	0.0535	Under Performing	**0**
47	**CEIG**	0.0086	0.3303	0.0999	0.6697	0.0669	Under Performing	**0**
48	**ABMS**	0.0002	0.2389	0.0999	0.7611	0.0760	Under Performing	**0**
49	**AIEI**	-0.0016	0.2641	0.0999	0.7359	0.0735	Under Performing	**0**
50	**ZEIC**	-0.0030	0.0796	0.0999	0.9204	0.0919	Under Performing	**0**
51	**MALL**	-0.0003	0.6276	0.0999	0.3724	0.0372	Under Performing	**0**
52	**MSFT**	-0.0038	0.5760	0.0999	0.4240	0.0423	Under Performing	**0**
53	**SHIP**	0.0029	0.5490	0.0999	0.4510	0.0450	Under Performing	**0**
54	**JETT**	0.0021	0.3776	0.0999	0.6224	0.0621	Under Performing	**0**
55	**JTEL**	-0.0034	0.8398	0.0999	0.1602	0.0160	Under Performing	**0**
56	**JOPT**	0.0015	1.3735	0.0999	-0.3735	-0.0373	Performing	**1**
57	**JOEP**	-0.0042	1.0630	0.0999	-0.0630	-0.0063	Performing	**1**
58	**OFTC**	0.0015	1.0450	0.0999	-0.0450	-0.0045	Performing	**1**
59	**ATCO**	0.0062	0.7619	0.0999	0.2381	0.0238	Under Performing	**0**
60	**MANE**	0.0121	1.0800	0.0999	-0.0800	-0.0080	Performing	**1**
61	**NAQL**	-0.0046	1.4159	0.0999	-0.4159	-0.0415	Performing	**1**
62	**RICS**	-0.0005	0.5459	0.0999	0.4541	0.0453	Under Performing	**0**
63	**SITT**	-0.0112	0.2221	0.0999	0.7779	0.0777	Under Performing	**0**

5.3.3.2 Discriminant Indicators

Table 5.20: Estimation of Discriminant Function

Box's M		**89.574**
F	**Approx.**	14.060
	df1	6
	df2	15680.342
	Sig.	0.000

The function tests the null hypothesis of equal population covariance matrices. Box's M test was used to determine the homogeneity of population covariances. The results in Table 5.20 showed that the alternative hypothesis was accepted, indicating the heterogeneity of the population covariances. This means that the assumption of discriminant analysis was violated. Nonetheless, since it is a robust analysis, this violation can be ignored.

Using stepwise method, the variables that discriminate between performing and underperforming companies were identified. The canonical discriminant functions are summarised in Table 5.21.

Table 5.21: Summary of Canonical Discriminant Functions

Stepwise statistic

ASE-Index companies	**Eigen value**	**Variance Percentage%**	**Canonical Correlation**	**Wilks' lambda**	χ^2	**P**
	0.433	100	0.550	0.698	21.423	0.000

The Wilks' lambda of the discriminant function was below 1. Lambda ranges between 0 and 1, where 0 signifies major differences and 1 no differences. The lambda indicated that the function has the ability to distinguish between two groups, χ^2 = 21.423, $p < 0.05$. The results suggested that the function was able to significantly discriminate both groups. The canonical correlation for the sample companies was

0.550. Squaring this coefficient, it means that the discriminant functions explain 30.3 percent of the variance in the dependent variables. This rather low correlation was due to the exclusion of the other nine indicators, which were unable to significantly discriminate between the two groups.

Discriminant analysis aims to develop discriminant functions, that is, the linear combination of independent variables, that can discriminate between groups of the dependent variable. The discrimination criterion is based on Wilks' lambda. In this study, the analysis pertains to the discrimination of the dependent variable into either two groups, (1) (Jensen's alpha > 0) and (0) (Jensen's alpha < 0). The null and alternative hypotheses were as follows:

H_0: There is no average vector difference between groups (1) and (0).

H_1: There is an average vector difference between groups (1) and (0).

The Wilks' lambda and chi-square for the sample companies were 0.698 and 21.423. Because $p < 0.05$, H_1 was accepted, suggesting that there were average vector differences between groups (1) and (0).

Table 5.22: Canonical Discriminant Function Coefficients

Variable Chosen	**function**
	1
Stock Turnover Ratio (STR)	0.016
Earnings per Share (EPS)	1.924
Total Asset Turnover (TOA)	-0.467
(Constant)	-0.166
Unstandardized coefficients	

Table 5.22 shows the canonical discriminant function coefficients. EPS had the most influence, followed by STR and TOA. EPS and STR had positive coefficients while TOA otherwise, which means that the discriminant function was based on higher EPS and STR and lower TOA. Therefore, the discriminant function can be expressed as:

Z = - 0.166 + 0.016 (STR) + 1.924 (EPS) - 0.467 (TOA)

Table 5.23 shows the function at group centroid values. They are the means of the above function for each group (i.e. performing and underperforming). These values are used to assess the overall model fit.

Table 5.23: Functions at Group Centroids

Category	**Function**
	1
1	0.826
0	-0.508
Unstandardized canonical discriminant functions evaluated at group means	
(76.2%) of original grouped cases correctly classified	
Z_{cu} = -0.202292	

Based on those values, it is possible to calculate the cut-off point to discriminate between groups (1) and (0):

$$\boldsymbol{Zcu = \frac{N1Z1 + N0Z0}{N1 + N2}}$$

where:

N = total sample

Z1 = centroid of group (1)

Z2 = centroid of group (0)

thus:

$$\boldsymbol{Zcu = \frac{11(0.826) + 37(-0.508)}{11 + 37} = -0.202292}$$

The result shows that the cut-off point was -0.202. Companies with a Z-score of less than this value were grouped as underperforming and those otherwise as performing. In addition, the overall model accuracy was satisfactory, as it was able to correctly classify 76.2 percent of the original grouped cases.

5.3.3.3 Ranking of Companies

Companies with Z-scores above the cut-off point are ranked higher and vice versa. By ranking the companies according to their discriminant scores in 2018, it is possible to identify which of them are performing and underperforming (Table 5.24). The result showed that SABK had the highest rank with a score of 3.68, followed by JNTH with 3.49. This indicates that SABK was the best performing company in the ASE Index.

Table 5.24: Company Ranking Based on Z-score

Number	Company	2018 Ranking		Number	Company	2018 Ranking
1	**SABK**	3.67727		**33**	**ASPMM**	-0.06547
2	**JNTH**	3.49242		**34**	**AAFI**	-0.09821
3	**APOT**	2.91628		**35**	**JOEP**	-0.13229
4	**EICO**	1.87658		**36**	**JTEL**	-0.1323
5	**CEIG**	1.75429		**37**	**COHO**	-0.17525
6	**UCFI**	1.71112		**38**	**JIJC**	-0.17782
7	**JOPH**	1.59059		**39**	**JETT**	-0.17866
8	**AMAL**	1.20534		**40**	**MALL**	-0.19091
9	**IDMC**	1.17665		**41**	**FUTR**	-0.19116
10	**ATTA**	1.08144		**42**	**ZEIC**	-0.21794
11	**UINV**	0.94791		**43**	**FRST**	-0.23516
12	**ULDC**	0.90694		**44**	**ABMS**	-0.28865
13	**EMAR**	0.62485		**45**	**UMIC**	-0.3061
14	**JOPT**	0.26476		**46**	**ATCO**	-0.33413
15	**JOWM**	0.26414		**47**	**TIIC**	-0.34974
16	**JEIH**	0.26015		**48**	**AALU**	-0.40275
17	**NAQL**	0.23424		**49**	**DADI**	-0.60792
18	**UCIC**	0.23355		**50**	**MANE**	-0.85932
19	**SANA**	0.21164		**51**	**ARBK**	-1.13805
20	**WIRE**	0.19757		**52**	**JOIB**	-1.22515
21	**SHIP**	0.19436		**53**	**JOCM**	-1.42949
22	**RICS**	0.13632		**54**	**JOKB**	-1.48451
23	**PHNX**	0.13011		**55**	**EXFB**	-1.55118
24	**SITT**	0.12435		**56**	**THBK**	-1.56622
25	**MSFT**	0.0765		**57**	**BOJX**	-1.5717
26	**MBED**	0.05545		**58**	**UBSI**	-1.60851
27	**REDV**	0.04652		**59**	**JCBK**	-1.61757
28	**AIEI**	0.02578		**60**	**ABCO**	-1.6923
29	**JOST**	0.01839		**61**	**AHLI**	-1.75575
30	**AQAR**	-0.01855		**62**	**INVB**	-1.86701
31	**OFTC**	-0.0249		**63**	**CABK**	-1.8766
32	**JRCD**	-0.06425				

SABK is a financial services company listed in the ASE. The results indicated that it was a high performer in the market. This was also supported by its high trading volume. In addition, JNTH, a real estate firm, received high interest from investors in the market. On the other hand, the least performing company was CABK, which operates in the banking sector. This result may be logical because investors prefer to keep equity ownership in the banking sector in Jordan.

The canonical discriminant function was based on three of 12 independent variables: EPS, STR, and TOA. These three were found to discriminate and rank between performing and underperforming companies. Therefore, H_2 was accepted, the second research question was answered, and the second research objective was achieved. Next, the study aims to conduct a new investigations of financial information analysis by measuring the mediating effect of stock volatility on the relationships between accounting and market indicators and company performance. This is further explained in the next sections.

5.3.4 Volatility Measurement

The purpose of this section is to measure stock volatility and to investigate its mediating influence on the effects of accounting and market indicators on company performance. Several methods have been conducted to measure volatility, but the literature suggests GARCH family as the best empirical model. Therefore, the study employed this model.

The GARCH model has two components. First is the autoregressive conditional heteroskedasticity (ARCH) model proposed by Engle (1982), and the second one is GARCH introduced by Bollerslev (1986). The following subsections describe the measurement of stock volatility with both models.

5.3.4.1 Stock Price Volatility

Empirical findings produced using GARCH and ARCH models on monthly stock price data are presented in Table 5.25.

Table 5.25: Volatility of Stock Price

No.	Company	ARCH	GARCH		No.	Company	ARCH	GARCH
ASE INDEX		1.174186	-.0285313		**32**	**PHNX**	1.021167	0.0094684
1	**ARBK**	1.020159	0.002217		**33**	**REDV**	1.168988	-0.017661
2	**THBK**	1.028895	0.5544927		**34**	**DADI**	1.115282	0.0009802
3	**EXFB**	1.114517	-0.004362		**35**	**MBED**	0.7619066	0.3470969
4	**BOJX**	1.333391	-0.106562		**36**	**UMIC**	0.9872666	-0.1010149
5	**AHLI**	1.01193	-0.007988		**37**	**EICO**	1.066544	-0.0005798
6	**CABK**	1.309552	-0.005927		**38**	**APOT**	0.6033413	0.4054752
7	**JOIB**	0.986441	0.0128968		**39**	**JOPH**	0.9637778	0.9637778
8	**UBSI**	0.9893781	-0.014579		**40**	**JOCM**	0.8967261	-0.0025695
9	**JCBK**	1.185395	-0.006253		**41**	**JOST**	1.034192	0.0109795
10	**ABCO**	0.893849	-0.023047		**42**	**AALU**	0.946154	-0.014069
11	**INVB**	0.9894754	-0.001549		**43**	**ASPMM**	0.8208935	-0.1411348
12	**JOKB**	0.9804531	-0.019987		**44**	**UCIC**	0.9681979	-0.0013667
13	**JIJC**	1.043413	-0.003970		**45**	**WIRE**	1.171238	0.0020917
14	**TIIC**	0.7171652	-0.020705		**46**	**JOWM**	1.059275	-0.0203124
15	**FRST**	1.005364	0.0697275		**47**	**CEIG**	1.227913	-0.0053017
16	**UINV**	0.7350829	-0.106104		**48**	**ABMS**	0.8723044	0.1224718
17	**FUTR**	1.093428	0.000104		**49**	**AIEI**	0.9742913	0.0121655
18	**SANA**	0.6670317	0.2355284		**50**	**ZEIC**	0.8724167	0.0628558
19	**JEIH**	0.8165961	0.0753129		**51**	**MALL**	0.9625466	0.053182
20	**AMAL**	0.8268136	-0.059714		**52**	**MSFT**	1.193357	-0.0166829
21	**AAFI**	0.986785	0.0094618		**53**	**SHIP**	0.7236345	0.2418013
22	**UCFI**	1.191488	-0.00752		**54**	**JETT**	0.8467361	0.1439737
23	**SABK**	0.9740917	-0.048759		**55**	**JTEL**	1.251609	-0.0207078
24	**ULDC**	1.359691	-0.037872		**56**	**JOPT**	0.8993221	-0.0368087
25	**JRCD**	1.089684	-0.008906		**57**	**JOEP**	0.9253398	-0.0034318
26	**IDMC**	1.203301	-0.024179		**58**	**OFTC**	1.24599	-0.1072342
27	**EMAR**	1.177969	-0.012728		**59**	**ATCO**	0.6505527	0.4137681
28	**ATTA**	0.943483	-0.071641		**60**	**MANE**	1.025785	0.0576454
29	**COHO**	0.8751128	0.1814064		**61**	**NAQL**	1.010671	0.0229402
30	**AQAR**	0.9930822	0.0112768		**62**	**RICS**	1.146382	-0.1395231
31	**JNTH**	1.140322	-0.022823		**63**	**SITT**	0.9964687	0.0033342

5.3.4.2 Stock Return Volatility

Empirical findings produced using GARCH and ARCH models on monthly stock return data are presented in Table 5.26.

Table 5.26: Volatility of Stock Return

No.	Company	ARCH	GARCH		No.	Company	ARCH	GARCH
ASE INDEX		0.30459	0.57402		**32**	**PHNX**	1.61349	-0.01262
1	**ARBK**	0.344214	0.499191		**33**	**REDV**	-0.04825	-0.04666
2	**THBK**	0.133359	0.727141		**34**	**DADI**	0.315953	-0.12447
3	**EXFB**	-0.02407	-0.29994		**35**	**MBED**	0.985104	0.022475
4	**BOJX**	-0.0325	-0.89447		**36**	**UMIC**	0.148056	0.634712
5	**AHLI**	0.693895	0.155242		**37**	**EICO**	-0.0435	0.234147
6	**CABK**	-0.05407	0.432762		**38**	**APOT**	0.452593	0.436315
7	**JOIB**	0.120574	0.755039		**39**	**JOPH**	0.29142	0.70635
8	**UBSI**	0.353847	0.419787		**40**	**JOCM**	0.047477	-0.84827
9	**JCBK**	0.721353	0.04422		**41**	**JOST**	0.330522	0.577941
10	**ABCO**	0.025675	-0.91279		**42**	**AALU**	0.026793	-0.28615
11	**INVB**	0.556458	0.244757		**43**	**ASPMM**	0.053098	0.857196
12	**JOKB**	0.105365	0.742561		**44**	**UCIC**	0.711246	-0.00023
13	**JIJC**	0.163558	0.771449		**45**	**WIRE**	0.029387	0.15844
14	**TIIC**	0.368821	0.554465		**46**	**JOWM**	0.199001	0.01479
15	**FRST**	0.108127	-0.17409		**47**	**CEIG**	0.081028	-0.31029
16	**UINV**	0.015648	0.035153		**48**	**ABMS**	-0.06405	0.831813
17	**FUTR**	0.370227	-0.2431		**49**	**AIEI**	0.069434	-1.04707
18	**SANA**	0.379565	-0.02317		**50**	**ZEIC**	0.444476	-0.08392
19	**JEIH**	0.360653	0.271582		**51**	**MALL**	0.037439	0.915618
20	**AMAL**	0.519654	0.127572		**52**	**MSFT**	0.149746	0.812089
21	**AAFI**	0.526663	0.676661		**53**	**SHIP**	0.186749	-0.11476
22	**UCFI**	1.125223	0.026819		**54**	**JETT**	0.174531	-0.39268
23	**SABK**	1.165256	0.039787		**55**	**JTEL**	0.458189	0.706798
24	**ULDC**	0.614698	0.679924		**56**	**JOPT**	0.156555	0.729366
25	**JRCD**	0.100887	0.609372		**57**	**JOEP**	0.0875	0.777176
26	**IDMC**	0.168297	-0.21749		**58**	**OFTC**	0.209194	-0.01595
27	**EMAR**	0.599241	-0.01561		**59**	**ATCO**	0.260982	-0.1647
28	**ATTA**	0.270915	0.768169		**60**	**MANE**	0.58306	0.656994
29	**COHO**	0.058772	0.917795		**61**	**NAQL**	0.077792	-0.08618
30	**AQAR**	0.063626	0.057927		**62**	**RICS**	0.109596	0.872561
31	**JNTH**	0.880645	0.681193		**63**	**SITT**	0.098942	0.793334

The stock price volatility results in Table 5.25 indicated that JOPH had the most volatile stock price with a GARCH score of 0.964, followed by THBK with 0.554. They also indicated that the stock price of JOPH was the most volatile among ASE Index companies. Table 5.26, on the other hand, display stock return volatility of the sample companies. COHO had the highest stock return volatility, with a GARCH score of 0.918, followed by MALL with 0.916. The stock returns of COHO were thus the most volatile among ASE Index firms.

Furthermore, both tables show the volatility of the ASE Index. The GARCH stock price and stock return volatility scores for the ASE Index were -0.029 and 0.574. The volatility of the sample companies were lower or higher relative to the market index. The differences in volatility from a company to another reflects the different performance of the companies' shares in the market. Some companies perform well, but others do poorly.

Next, the mediating effect of stock volatility on the impact of accounting and market indicators on company performance was assessed using the GARCH scores. This is explained in further detail in the next sections.

5.3.5 Mediation Analysis

The mediation analysis was carried out in a single step using structural equation modelling (SEM) to test the third hypothesis "Stock price and return volatility mediates the relationships between accounting and market indicators and stock price and return". It was conducted separately for each indicator to verify this hypothesis. Accounting and market indicators are expected to affect company performance within the mediation of stock volatility. The following sub-sections determine the positive or negative effect of

stock volatility on the relationships between accounting and market indicators and company performance.

5.3.5.1 Mediation in Stock Price Model

This section discusses the mediating influence of stock price volatility (PV) on the relationships between the 12 accounting and market indicators and stock price (P).

1. Return on Assets (ROA)

Table 5.27 shows the mediation effect of price volatility (PV) on the impact of ROA on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between return on asset and stock price".

Table 5.27: Mediation Effect of PV on ROA and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	8.872547	0.8544676	10.38	0.000
Return on Assets (ROA)	0.2581362	0.0202201	12.77	0.000
_Cons	1.469192	0.1556095	9.44	0.000
Regression (PV)				
Return on Assets (ROA)	0.0041459	0.000885	4.68	0.000
_Cons	0.0342306	0.0067946	5.04	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 90.97		**Prob > chi2 = 0.0000**		
Z = 1.694		**Prob > Z = 0.0000**		
R-squared = 0.3208		**Adj R-squared = 0.3188**		

In Model 1, ROA positively and significantly affected PV, B = 0.004, $p < 0.05$. When PV and ROA were included in Model 2, it was found that ROA had a significant direct effect on stock price (B = 0.258, $p < 0.05$), while PV positively and significantly influenced stock price (B = 8.873, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was 0.004 x 8.873 = 0.037. Results of Model 2 showed that ROA had a significant direct effect on stock price. According to Zhao et al. (2010), the significant

relationship between the independent (ROA) and dependent (stock price) variables is not necessary and can be misleading, since "all that matters is that the indirect effect is significant". In this case, the mediation effect was found to be positive and partial. Table 5.27 reports that the conservative Sobel–Goodman test for the indirect effect of ROA on stock price via PV was significant, Z = 1.694, $p < 0.05$. Furthermore, the Wald chi-square was significant ($\chi^2 = 90.97$, $p < 0.05$), and the model explained 32.08 percent of variance in stock price. Therefore, this sub-hypothesis was accepted.

2. Return on Equity (ROE)

Table 5.28 shows the mediation effect of price volatility (PV) on the impact of ROE on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between return on equity and stock price".

Table 5.28: Mediation Effect of PV on ROE and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.77411	0.9335191	11.54	0.010
Return on Equity (ROE)	0.0032019	0.0021749	1.47	0.141
_Cons	1.980125	0.1670826	11.85	0.000
Regression (PV)				
Return on Equity (ROE)	0.0000162	0.0000885	0.18	0.854
_Cons	0.0440518	0.0065898	6.68	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 15.88		**Prob > chi2 = 0.0004**		
Z = 6.51		**Prob > Z = 0.5501**		
R-squared = 0.1637		**Adj R-squared = 0.1612**		

In Model 1, ROE affected PV positively but non-significantly, B = 0.000, $p > 0.05$. When PV and ROE were included in Model 2, it was found that ROE had a non-significant direct effect on stock price (B = 0.0032, $p > 0.05$), while PV had a positive and significant effect on stock price (B = 10.774, $p < 0.010$). In this case, the non-

significant effect of ROE in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

3. Net Profit Margin (NPM)

Table 5.29 shows the mediation effect of price volatility (PV) on the impact of NPM on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between net profit margin and stock price".

Table 5.29: Mediation Effect of PV on NPM and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.77096	0.934864	11.52	0.000
Net Profit Margin (NPM)	0.0001613	0.0002452	0.66	0.511
_Cons	2.008037	0.1666259	12.05	0.000
Regression (PV)				
Net Profit Margin (NPM)	0.00000543	0.00000996	0.55	0.585
_Cons	0.0442948	0.0065582	6.75	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 15.26		**Prob > chi2 = 0.0005**		
Z = 6.48		**Prob > Z = 0.1800**		
R-squared = 0.1616		**Adj R-squared = 0.1591**		

In Model 1, NPM positively but non-significantly affected PV, B = 0.000, P > 0.05. When PV and NPM were included in Model 2, it was found that NPM had a non-significant direct effect (B = 0.000, p > 0.05), while PV had a positive and significant influence on stock price (B = 10.771, p < 0.05). However, the non-significant effect of NPM in Model 1 led to the non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

4. Current Ratio (CR)

Table 5.30 shows the mediation effect of price volatility (PV) on the impact of CR on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between current ratio and stock price".

Table 5.30: Mediation Effect of PV on CR and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.86332	0.9322995	11.65	0.000
Current Ratio (CR)	-0.0362472	0.0162485	-2.23	0.026
_Cons	2.153861	0.1790605	12.03	0.000
Regression (PV)				
Current Ratio (CR)	0.0006673	0.0006616	1.01	0.313
_Cons	0.0413495	0.0071248	5.80	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 15.48		**Prob > chi2 = 0.0004**		
Z = 6.918		**Prob > Z = 0.4519**		
R-squared = 0.1670		**Adj R-squared = 0.1646**		

In Model 1, CR negatively and non-significantly affected PV, B = 0.001, $p > 0.05$. When PV and CR were included in Model 2, it was found that CR had a significantly negative direct effect on stock price (B = -0.036, $p < 0.05$), while PV had a positive and significant effect on stock price, B = 10.86, $p < 0.05$. However, the non-significant effect of CR in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

5. Debt Ratio (DR)

Table 5.31 shows the mediation effect of price volatility (PV) on the impact of CR on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between debt ratio and stock price".

Table 5.31: Mediation Effect of PV on DR and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.89315	0.9306291	11.71	0.000
Debt Ratio (DR)	0.0150348	0.0054132	2.78	0.005
_Cons	1.421648	0.2671803	5.32	0.000
Regression (PV)				
Debt Ratio (DR)	-0.0002463	0.0002208	-1.12	0.265
_Cons	0.0536348	0.0107139	5.01	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 15.41		**Prob > chi2 = 0.0005**		
Z = 7.081		**Prob > Z = 0.2310**		
R-squared = 0.1703		**Adj R-squared = 0.1679**		

In Model 1, DR affected the PV negatively but non-significantly (B = -0.000, p > 0.05). When PV and DR were included in Model 2, it was found that DR had a significantly positive direct effect on stock price (B = 0.015, p < 0.05), and that PV had a positively significant effect on stock price (B = 10.89, p < 0.05). However, the non-significant effect of DR in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

6. Total Asset Turnover (TOA)

Table 5.32 shows the mediation effect of price volatility (PV) on the impact of TOA on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between total asset turnover and stock price".

Table 5.32: Mediation Effect of PV on TOA and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.86954	0.9270238	11.73	0.000
Total Assets Turnover (TOA)	0.3397872	0.0965064	3.52	0.000
_Cons	1.592924	0.2021879	7.88	0.000
Regression (PV)				
Total Assets Turnover (TOA)	-0.0027379	0.0039532	-0.69	0.489
_Cons	0.0474557	0.0080866	5.87	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 21.92		**Prob > chi2 = 0.0000**		
Z = 7.358		**Prob > F = 0.3170**		
R-squared = 0.1758		**Adj R-squared = 0.1734**		

In Model 1, TOA affected PV negatively but non-significantly (B = -0.003, p > = 0.05). When PV and TOA were included in Model 2, it was found that TOA had a significantly positive direct effect (B = 0.339, p < 0.05), and PV had a positively significant effect on stock price (B = 10.87, p < 0.05). However, the non-significant effect of TOA in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

7. Market Capitalisation (MC)

Table 5.33 shows the mediation effect of price volatility (PV) on the impact of MC on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between market capitalisation and stock price".

Table 5.33: Mediation Effect of PV on MC and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.21561	0.9096252	11.23	0.000
Market Capitalisation (MC)	1.11e-08	1.64e-09	6.74	0.021
_Cons	1.677328	0.1684629	9.96	0.000
Regression (PV)				
Market Capitalisation (MC)	1.67e-10	6.82e-11	2.45	0.014
_Cons	0.0388641	0.0068785	5.65	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 84.41		**Prob > chi2 = 0.0000**		
Z = 1.321		**Prob > Z = 0.0000**		
R-squared = 0.2127		**Adj R-squared = 0.2104**		

In Model 1, MC affected PV positively and significantly (B = 1.67e-10, $p < 0.05$). When PV and MC were included in Model 2, it was found that MC had a significant direct effect on stock price (B = 1.11e-08, $p < 0.05$), and PV had a positive and significant effect on stock price (B = 10.22, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was 1.67e-10 x 10.216 = 1.707e-09. In Model 2, MC had a significant direct effect on stock price. According to Zhao et al. (2010), the significant relationship between MC and stock price is not necessary and can be misleading, because "all that matters is that the indirect effect is significant". In this case, the mediation effect was positive and partial. Table 5.33 reports that the conservative Sobel–Goodman test for the indirect effect of MC on stock price via PV was significant ($Z = 1.321$, $p < 0.05$). Wald chi2 was significant ($\chi^2 = 84.41$, $p < 0.05$) and the R^2 was 21.27 percent. Therefore, the sub-hypothesis was accepted.

8. Stock Turnover Ratio (STR)

Table 5.34 shows the mediation effect of price volatility (PV) on the impact of CR on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between stock turnover ratio and stock price".

Table 5.34: Mediation Effect of PV on STR and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.61772	0.9374123	11.33	0.000
Stock Turnover Ratio (STR)	0.0012645	0.0007072	1.79	0.074
_Cons	2.120117	0.1784327	11.88	0.000
Regression (PV)				
Stock Turnover Ratio (STR)	0.0000747	0.0000285	2.62	0.009
_Cons	0.0506062	0.0069704	7.26	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 68.13		**Prob > chi2 = 0.0004**		
Z = 1.577		**Prob > Z = 0.0000**		
R-squared = 0.1649		**Adj R-squared = 0.1625**		

In Model 1, STR affected PV positively and significantly (B = 0.000, $p < 0.05$). When PV and STR were included in Model 2, it was found that the direct effect of STR reduced and became non-significant (B = 0.001, $p > 0.05$), while PV had a positive and significant effect on stock price (B = 10.617, $p < 0.05$). Thus, the indirect effect of B_1 Model 1 and B_2 Model 2 was 0.000 x 10.617 = 0.001. According to Zhao et al. (2010), the non-significant relationship between STR and stock price in Model 2 suggested the presence of full and positive mediation. In addition, Table 5.34 reports that the conservative Sobel–Goodman test for the indirect effect of stock turnover ratio (STR) on price via price volatility (PV) was significant (Z = 1.577, $p < 0.05$). Furthermore, Wald chi-square was significant ($\chi^2 = 68.13$, $p <= 0.05$) and the R^2 was 16.49 percent. Therefore, the sub-hypothesis was accepted.

9. Earnings per Share (EPS)

Table 5.35 shows the mediation effect of price volatility (PV) on the impact of EPS on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between earnings per share and stock price".

Table 5.35: Mediation Effect of PV on EPS and P

Structural Equation Model Price (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	2.882354	0.5870883	4.91	0.000
Earnings per Share (EPS)	9.741065	0.2661653	36.60	0.000
_Cons	0.9013544	0.1018184	8.85	0.000
Regression (PV)				
Earnings per Share (EPS)	0.1667211	.0160151	10.41	0.000
_Cons	0.0193302	0.006547	2.95	0.003
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 72.05		**Prob > chi2 = 0.0000**		
Z = 6.03		**Prob > Z = 0.0000**		
R-squared = 0.7139		**Adj R-squared = 0.7131**		

In Model 1, EPS affected PV positively and significantly (B = 0.167, $p < 0.05$). When PV and EPS were included in Model 2, it was found that EPS had a significant direct effect (B = 9.741, $p < 0.05$), while PV had a positive and significant effect on stock price (B = 2.882, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was 0.167 x 2.882 = 0.481. In Model 2, EPS had a significant direct effect on stock price. Full mediation must only be established by the existence of an indirect effect. In this case, the moderation effect was positive and partial. Table 5.35 reports that the conservative Sobel–Goodman test for the indirect effect of EPS on stock price via PV was significant (Z = 6.03, $p < 0.05$). Furthermore, Wald chi-square was significant ($\chi^2 = 72.05$, $p < 0.05$) and the R^2 was 71.39 percent. Therefore, the sub-hypothesis was accepted.

10. Book Value per Share (BPS)

Table 5.36 shows the mediation effect of price volatility (PV) on the impact of BPS on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between book value per share and stock price".

Table 5.36: Mediation Effect of PV on BPS and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	-0.6118003	0.799575	-0.77	0.444
Book Value per Share (BPS)	2.094549	0.0810233	25.85	0.000
_Cons	-1.316452	0.1749858	-7.52	0.000
Regression (PV)				
Book Value per Share (BPS)	0.0558655	0.0032115	17.40	0.000
_Cons	-0.057812	0.0080181	-7.21	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 42.00		**Prob > chi2 = 0.0000**		
Z = 6.279		**Prob > Z = 0. 2330**		
R-squared = 0.5729		**Adj R-squared = 0.5717**		

In Model 1, BPS affected PV positively and significantly (B = 0.056, $p < 0.05$). When PV and BPS were included in Model 2, it was found that BPS had a significant positive direct effect (B = 2.094, $p < 0.05$), and that PV had a negative non-significant effect on stock price (B = -0.612, $p > 0.05$). The non-significant effect of PV Model 2 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

11. Price Earnings Ratio (PER)

Table 5.37 shows the mediation effect of price volatility (PV) on the impact of PER on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between price earnings ratio and stock price".

Table 5.37: Mediation Effect of PV on PER and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.78592	0.9352228	11.53	0.000
Price Earnings Ratio (PER)	-0.0000814	0.0008303	-0.10	0.922
_Cons	2.004772	0.166791	12.02	0.000
Regression (PV)				
Price Earnings Ratio (PER)	0.0000215	0.0000337	0.64	0.524
_Cons	.0439207	.0065661	6.69	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 66.23		**Prob > chi2 = 0.0005**		
Z = 1.519		**Prob > Z = 0.7610**		
R-squared = 0.1611		**Adj R-squared = 0.1586**		

In Model 1, PER affected PV positively but non-significantly (B = 0.000, p > 0.05). When PV and PER were included in Model 2, it was found that PER had a non-significant direct effect (B = -0.000, p > 0.05), while PV had a positive significant effect on stock price (B = 10.785, p < 0.05). Therefore, the non-significant effects in Model 1 and Model 2 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

12. Price-to-book Value (PBV)

Table 5.38 shows the mediation effect of price volatility (PV) on the impact of PBV on stock price. This analysis was carried out to test the following sub-hypothesis: "stock price volatility mediates the relationship between price-to-book value and stock price".

Table 5.38: Mediation Effect of PV on PBV and P

Structural Equation Model Price (P)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Price Volatility (PV)	10.67334	0.9312087	11.46	0.000
Price-to-book Value (PBV)	0.0871722	0.0329644	2.64	0.008
_Cons	1.886646	0.1715554	11.00	0.000
Regression (PV)				
Price-to-book Value (PBV)	0.0015865	0.0013434	1.18	0.238
_Cons	0.0419518	0.0068144	6.16	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 70.38		**Prob > chi2 = 0.0000**		
Z = 2.277		**Prob > Z = 04931**		
R-squared = 0.1694		**Adj R-squared = 0.1670**		

In Model 1, PBV affected PV positively and non-significantly (B = 0.002, p > 0.05). When PV and PBV were included in Model 2, it was found that PBV had a significant direct effect (B = 0.087, p < 0.05), while PV had a positive significant effect on stock price (B = 10.673, p < 0.05). However, the non-significant effect of PBV in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

The mediation analysis of price volatility was carried out to test the mediation effect of stock price volatility on the relationships between accounting and market indicators and stock price. Twelve sub-hypotheses were tested. Table 5.39 summarises the verification of all sub-hypotheses. The analysis concluded that PV could mediate the effects of accounting and market indicators, specifically ROA, MC, STR, and EPS,

on stock price. The same analysis was carried out for stock return. This is presented in the following section.

Table 5.39: Sub-Hypotheses Verification for PV

Hypothesis	**Result**
Stock price volatility mediates the relationship between return on asset and stock price	**Accepted****
Stock price volatility mediates the relationship between return on equity and stock price	Rejected
Stock price volatility mediates the relationship between net profit margin and stock price	Rejected
Stock price volatility mediates the relationship between current ratio and stock price	Rejected
Stock price volatility mediates the relationship between debt ratio and stock price	Rejected
Stock price volatility mediates the relationship between total assets turnover and stock price	Rejected
Stock price volatility mediates the relationship between market capitalisation and stock price	**Accepted****
Stock price volatility mediates the relationship between stock turnover ratio and stock price	**Accepted***
Stock price volatility mediates the relationship between earnings per share and stock price	**Accepted****
Stock price volatility mediates the relationship between book value per share and stock price	Rejected
Stock price volatility mediates the relationship between price earnings ratio and stock price	Rejected
Stock price volatility mediates the relationship between price-to-book value and stock price	Rejected

Note: ***** Full mediation, ****** partial mediation

5.3.5.2 Mediation in Stock Return Model

This section discusses the mediating influence of stock return (RV) volatility on the effects of the 12 accounting and market indicators towards stock return (R).

1. Return on Assets (ROA)

Table 5.40 shows the mediation effect of return volatility (RV) on the impact of ROA on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between return on asset and stock return".

Table 5.40: Mediation Effect of RV on ROA and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.274636	0.0692268	3.97	0.000
Return on Assets (ROA)	0.0106568	0.0018144	5.87	0.000
_Cons	-0.1412802	0.024561	-5.75	0.000
Regression (RV)				
Return on Assets (ROA)	-0.0065261	0.0009643	-6.77	0.000
_Cons	0.2964719	0.0074031	40.05	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 41.18		**Prob > chi2 = 0.0000**		
Z = 2.050		**Prob > Z = 0.0000**		
R-squared = 0.0561		**Adj R-squared = 0.0534**		

In Model 1, ROA affected RV negatively and significantly ($B = -0.007$, $p < 0.05$). When RV and ROA were included in Model 2, it was found that ROA had a significant direct effect ($B = 0.011$, $p < 0.05$), while RV had a positive and significant effect on stock return ($B = 0.275$, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was -0.007 x 0.275 = -0.0002. In Model 2, ROA had a significant direct effect on stock return. In this case, the mediation effect was negative and partial. Table 5.40 reports that the conservative Sobel–Goodman test for the indirect effect of ROA on stock return via RV was significant ($Z = 2.050$, $p < 0.05$). Furthermore, Wald chi-square

was significant ($\chi^2 = 41.18$, $p < 0.05$) and R^2 was 5.61 percent. Therefore, the sub-hypothesis was accepted.

2. Return on Equity (ROE)

Table 5.41 shows the mediation effect of return volatility (RV) on the impact of ROE on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between return on equity and stock return".

Table 5.41: Mediation Effect of RV on ROE and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1708998	0.0688165	2.48	0.013
Return on Equity (ROE)	-0.0001019	0.0001776	-0.57	0.566
_Cons	-0.0858184	0.023471	-3.66	0.000
Regression (RV)				
Return on Equity (ROE)	-0.0001633	0.0000978	-1.67	0.095
_Cons	0.2820535	0.0072844	38.72	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 6.70		**Prob > chi2 = 0.0050**		
Z = 3.34		**Prob > Z = 0.3610**		
R-squared = 0.0096		**Adj R-squared = 0.0067**		

In Model 1, ROE affected RV negatively and significantly ($B = -0.000$, $p < 0.10$). When RV and ROE were included in Model 2, it was found that ROE had a non-significant direct effect ($B = -0.000$, $p > 0.05$), while RV had a positive and significant effect on stock return ($B = 0.171$, $p < 0.05$). However, the non-significant effect of ROE in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

3. Net Profit Margin (NPM)

Table 5.42 shows the mediation effect of return volatility (RV) on the impact of NPM on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between net profit margin and stock return".

Table 5.42: Mediation Effect of RV on NPM and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1770323	0.0687173	2.58	0.010
Net Profit Margin(NPM)	0.0000217	0.00002	1.09	0.276
_Cons	-0.0878301	0.0233212	-3.77	0.000
Regression (RV)				
Net Profit Margin (NPM)	-0.0000141	0.000011	-1.28	0.201
_Cons	0.2805072	0.0072568	38.65	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 7.57		**Prob > chi2 = 0.0227**		
Z = 3.77		**Prob > Z = 0.2360**		
R-squared = 0.0108		**Adj R-squared = 0.0079**		

In Model 1, NPM affected RV negatively but non-significantly (B = -0.000, $p > 0.05$). When RV and NPM were included in Model 2, it was found that NPM had a non-significant direct effect (B = 0.000, $p > 0.05$), while RV had a positive and significant effect on stock return (B = 0.177, $p < 0.05$). However, the non-significant effect of NPM in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

4. Current Ratio (CR)

Table 5.43 shows the mediation effect of return volatility (RV) on the impact of CR on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between current ratio and stock return".

Table 5.43: Mediation Effect of RV on CR and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1720755	0.0686717	2.51	0.012
Current Ratio (CR)	-0.0011805	0.0013256	-0.89	0.373
_Cons	-0.0819207	0.0240894	-3.40	0.001
Regression (RV)				
Current Ratio (CR)	-0.0004175	0.0007331	-0.57	0.569
_Cons	0.2825868	0.0078953	35.79	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 7.17		**Prob > chi2 = 0.0277**		
Z = 3.57		**Prob > Z = 0.2870**		
R-squared = 0.0102		**Adj R-squared = 0.0074**		

In Model 1, CR affected RV negatively but non-significantly (B = -0.000, p > 0.05). When RV and CR were included in Model 2, it was found that CR had a non-significant direct effect (B = -0.001, p > 0.05), while RV had a positive and significant effect on stock return (B = 0.172, p < 0.05). However, the non-significant effect of CR in Model 1 led to a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

5. Debt Ratio (DR)

Table 5.44 shows the mediation effect of return volatility (RV) on the impact of DR on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between debt ratio and stock return".

Table 5.44: Mediation Effect of RV on DR and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1649291	0.0702877	2.35	0.019
Debt Ratio (DR)	-0.0002565	0.0004528	-0.57	0.571
_Cons	-0.0750609	0.0317875	-2.36	0.018
Regression (RV)				
Debt Ratio (DR)	-0.0013704	0.0002391	-5.73	0.000
_Cons	0.3334521	0.0116055	28.73	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 6.70		**Prob > chi2 = 0.0352**		
Z = 3.33		**Prob > Z = 0.0363**		
R-squared = 0.0096		**Adj R-squared = 0.0067**		

In Model 1, DR affected RV negatively and significantly (B = -0.001, $p < 0.05$). When RV and DR were included in Model 2, it was found that the direct effect of DR reduced and became non-significant (B = -0.000, $p > 0.05$), while RV had a positive and significant effect on stock return (B = 0.165, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was -0.001 x 0.165 = -0.0002. The non-significant relationship between DR and stock return in Model 2 suggested the presence of full negative mediation. In addition, Table 5.44 reports that the conservative Sobel–Goodman test for the indirect effect of DR on stock return via RV was significant (Z = 3.33, $p < 0.05$). The Wald chi-square was significant ($\chi^2 = 6.70$, $p < 0.05$) and the R^2 was 0.96 percent. Therefore, the sub-hypothesis was accepted.

6. Total Asset Turnover (TOA)

Table 5.45 shows the mediation effect of return volatility (RV) on the impact of TOA on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between total asset turnover and stock return".

Table 5.45: Mediation Effect of RV on TOA and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1970424	0.073354	2.69	0.007
Total Assets Turnover (TOA)	0.0077405	0.008458	0.92	0.360
_Cons	-0.1032061	0.0290923	-3.55	0.000
Regression (RV)				
Total Assets Turnover (TOA)	-0.0406117	0.0040994	-9.91	0.000
_Cons	0.329487	0.0083856	39.29	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 7.22		**Prob > chi2 = 0.0071**		
Z = 3.59		**Prob > F = 0.0280**		
R-squared = 0.0103		**Adj R-squared = 0.0074**		

In Model 1, TOA affected RV negatively and significantly ($B = -0.041$, $p < 0.05$). When RV and TOA were included in Model 2, it was found that the direct effect of TOA reduced and became non-significant ($B = 0.008$, $p > 0.05$), while RV had a positive and significant effect on stock return ($B = 0.197$, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was -0.041 x 0.197 = -0.008. The non-significant relationship between TOA and stock return in Model 2 suggested the presence of full and negative mediation. In addition, Table 5.45 reports that the conservative Sobel–Goodman test for the indirect effect of TOA on stock return via RV was significant ($Z = 3.59$, $p < 0.05$). The Wald chi-square was also significant ($\chi^2 = 7.22$, $p < 0.05$) and the R^2 was 1.03 percent. Therefore, the sub-hypothesis was accepted.

7. Market Capitalisation (MC)

Table 5.46 shows the mediation effect of return volatility (RV) on the impact of MC on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between market capitalisation and stock return".

Table 5.46: Mediation Effect of RV on MC and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1649336	0.0687144	2.40	0.016
Market Capitalisation (MC)	2.40e-10	1.37e-10	1.75	0.080
_Cons	-0.092547	0.0234777	-3.94	0.000
Regression (RV)				
Market Capitalisation (MC)	1.41e-10	7.57e-11	1.86	0.043
_Cons	0.2763471	0.0076325	36.21	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 5.76		**Prob > chi2 = 0.0164**		
Z = 4.71		**Prob > Z = 0.0093**		
R-squared = 0.0135		**Adj R-squared = 0.0106**		

In Model 1, MC affected RV positively and significantly (B = 1.41e-10, $p < 0.05$). When RV and MC were included in Model 2, it was found that MC had a positive and significant direct effect (B = 2.40e-10, $p < 0.10$). RV had a positive and significant effect on stock return (B = 0.165, $p < 0.05$), which reduced the effect of MC. Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was 1.41e-10 x 0.165 = 2.326. The reduced effect of MC on stock return in Model 2 suggested full positive mediation, established only by the existence of an indirect effect. In addition, Table 5.46 reports that the conservative Sobel–Goodman test for the indirect effect of MC on stock return via RV was significant (Z = 4.71, $p < 0.05$). Furthermore, the Wald chi-square was also significant ($\chi^2 = 5.76$, $p < 0.05$) and the R^2 was 1.35 percent. Therefore, the sub-hypothesis was accepted.

8. Stock Turnover Ratio (STR)

Table 5.47 shows the mediation effect of return volatility (RV) on the impact of STR on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between stock turnover ratio and stock return".

Table 5.47: Mediation Effect of RV on STR and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1603279	0.0700206	2.29	0.022
Stock Turnover Ratio (STR)	0.0000555	0.0000585	0.95	0.343
_Cons	-0.0883965	0.02335	-3.79	0.000
Regression (RV)				
Stock Turnover Ratio (STR)	0.0001645	0.0000311	5.29	0.000
_Cons	0.2666564	0.0076067	35.06	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 7.28		**Prob > chi2 = 0.0263**		
Z = 3.62		**Prob > Z = 0.0272**		
R-squared = 0.0104		**Adj R-squared = 0.0075**		

In Model 1, STR affected RV positively and significantly (B = 0.0002, $p < 0.05$). When RV and STR were included in Model 2, it was found that the direct effect of STR reduced and became non-significant (B = 0.000, $p > 0.05$). RV, on the other hand, had a positive and significant effect on stock return (B = 0.160, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was 0.0002 x 0.160 = 0.00003. According to Zhao et al. (2010), the non-significant relationship between STR and stock return in Model 2 suggested the presence of full positive mediation. In addition, Table 5.47 reports that the conservative Sobel–Goodman test for the indirect effect of STR on stock return via RV was significant (Z = 3.62, $p < 0.05$). Furthermore, the Wald chi-square was significant ($\chi^2 = 7.28$, $p < 0.05$) and the R^2 was 1.04 percent. Therefore, the sub-hypothesis was accepted.

9. Earnings per Share (EPS)

Table 5.48 shows the mediation effect of return volatility (RV) on the impact of EPS on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between earnings per share and stock return".

Table 5.48: Mediation Effect of RV on EPS and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.221113	0.0696292	3.18	0.001
Earnings per Share (EPS)	0.1167996	0.0349639	3.34	0.001
_Cons	-0.1180948	0.0249192	-4.74	0.000
Regression (RV)				
Earnings per Share (EPS)	-0.1030077	0.0186692	-5.52	0.000
_Cons	0.296169	0.007632	38.81	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 17.63		**Prob > chi2 = 0.0001**		
Z = 8.78		**Prob > Z = 0.0002**		
R-squared = 0.0248		**Adj R-squared = 0.0220**		

In Model 1, EPS affected RV negatively and significantly (B = -0.103, $p < 0.05$). When RV and EPS were included in Model 2, it was found that EPS had a significant direct effect (B = 0.117, $p < 0.05$), while RV had a positive and significant effect on stock return (B = 0.221, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was -0.103 x 0.221 = -0.023. In Model 2, EPS had a significant direct effect on stock return. The significant relationship between EPS and stock return is not necessary and can be misleading (Zhao et al., 2010). In this case, the mediation effect was partial and negative. However, Table 5.48 reports that the conservative Sobel–Goodman test for the indirect effect of EPS on stock return via RV was significant (Z = 8.78, $p < 0.05$). Furthermore, the Wald chi-square was significant ($\chi^2 = 17.63$, $p < 0.05$) and the R^2 was 2.48 percent. Therefore, the sub-hypothesis was accepted.

10. Book Value per Share (BPS)

Table 5.49 shows the mediation effect of return volatility (RV) on the impact of BPS on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between book value per share and stock return".

Table 5.49: Mediation Effect of RV on BPS and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1748595	0.0708512	2.47	0.014
Book Value per Share (BPS)	0.0006699	0.007952	0.08	0.933
_Cons	-0.0889236	0.0303394	-2.93	0.003
Regression (RV)				
Book Value per Share (BPS)	-0.0274806	0.0041337	-6.65	0.000
_Cons	0.3309869	0.0103205	32.07	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 6.38		**Prob > chi2 = 0.0412**		
Z = 3.18		**Prob > Z = 0.0424**		
R-squared = 0.0091		**Adj R-squared = 0.0062**		

In Model 1, BPS affected RV negatively and significantly (B = -0.027, $p < 0.05$). When RV and BPS were included in Model 2, it was found that the direct effect of BPS reduced and became non-significant (B = 0.001, $p > 0.05$). RV had a positive and significant effect on stock return (B = 0.175, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was -0.027 x 0.175 = -0.005. The non-significant relationship between BPS and stock return in Model 2 suggested the presence of full negative mediation. In addition, Table 5.49 reports that the conservative Sobel–Goodman test for the indirect effect of BPS on stock return via RV was significant (Z = 3.18, $p < 0.05$). Furthermore, the Wald chi-square was significant ($\chi^2 = 6.38$, $p < 0.05$) and the R^2 was 0.91 percent. Therefore, the sub-hypothesis was accepted.

11. Price Earnings Ratio (PER)

Table 5.50 shows the mediation effect of return volatility (RV) on the impact of PER on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between price earnings ratio and stock return".

Table 5.50: Mediation Effect of RV on PER and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1736386	0.0688892	2.52	0.012
Price Earnings Ratio (PER)	3.15e-06	0.0000677	0.05	0.963
_Cons	-0.087395	0.0234443	-3.73	0.000
Regression (RV)				
Price Earnings Ratio (PER)	-0.0000738	0.0000372	-1.98	0.048
_Cons	0.2816908	0.0072541	38.83	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 6.37		**Prob > chi2 = 0.0413**		
Z = 3.17		**Prob > Z = 0.0425**		
R-squared = 0.0091		**Adj R-squared = 0.0062**		

In Model 1, PER affected RV negatively and significantly (B = -0.000, $p < 0.05$). When RV and PER were included in Model 2, it was found that the direct effect of PER reduced and became non-significant (B = 3.15e-06, $p > 0.05$), while RV had a positive and significant effect on stock return (B = 0.174, $p < 0.05$). Therefore, the indirect effect of B_1 Model 1 and B_2 Model 2 was -0.000 x 0.174 = -0.000001. The non-significant relationship between PER and stock return in Model 2 suggested the presence of full negative mediation. In addition, Table 5.50 reports that the conservative Sobel–Goodman test for the indirect effect of PER on stock return via RV was significant (Z = 3.17, $p < 0.05$). Furthermore, the Wald chi-square was significant ($\chi^2 = 6.37$, $p < 0.05$) and the R^2 was 0.91 percent. Therefore, the sub-hypothesis was accepted.

12. Price-to-book Value (PBV)

Table 5.51 shows the mediation effect of return volatility (RV) on the impact of PBV on stock return. This analysis was carried out to test the following sub-hypothesis: "stock return volatility mediates the relationship between price-to-book value and stock return".

Table 5.51: Mediation Effect of RV on PBV and R

Structural Equation Model Return (R)	**Coefficient**	**Std. Err.**	**T-Test**	**P> |T-Test|**
Return Volatility (RV)	0.1710278	0.0684543	2.50	0.012
Price-to-book Value (PBV)	0.0060296	0.002684	2.25	0.025
_Cons	-0.0950728	0.0235081	-4.04	0.000
Regression (RV)				
Price-to-book Value (PBV)	0.0006043	0.0014892	0.41	0.685
_Cons	0.2799723	0.0075543	37.06	0.000
Model Summary				
Number of Obs. = 693		**Time periods = 11**		
Wald chi2 = 11.46		**Prob > chi2 = 0.0032**		
Z = 5.71		**Prob > Z = 0.105**		
R-squared = 0.0163		**Adj R-squared = 0.0134**		

In Model 1, PBV affected RV positively but non-significantly (B = 0.001, p > 0.05). When RV and PBV were included in Model 2, it was found that PBV had a significant direct effect (B = 0.006, p < 0.05), while RV had a positive and significant effect on stock return (B = 0.171, p < 0.05). However, the non-significant effect of PBV in Model 2 suggested a non-significant mediation effect. Therefore, the sub-hypothesis was rejected.

The mediation analysis of return volatility was carried out to test the mediation effect of stock return volatility on the relationships between accounting and market indicators and stock return. Twelve sub-hypotheses were tested. Table 5.52 summarises the verification of all sub-hypotheses. The analysis concluded that RV could mediate the effects of accounting and market indicators, specifically ROA, DR, TOA, MC, STR, EPS, BPS, and PER, on stock return.

Table 5.52: Sub-Hypotheses Verification for RV

Hypothesis	**Result**
Stock return volatility mediates the relationship between return on asset and stock return	**Accepted****
Stock return volatility mediates the relationship between return on equity and stock return	Rejected
Stock return volatility mediates the relationship between net profit margin and stock return	Rejected
Stock return volatility mediates the relationship between current ratio and stock return	Rejected
Stock return volatility mediates the relationship between debt ratio and stock return	**Accepted***
Stock return volatility mediates the relationship between total assets turnover and stock return	**Accepted***
Stock return volatility mediates the relationship between market capitalisation and stock return	**Accepted***
Stock return volatility mediates the relationship between stock turnover ratio and stock return	**Accepted***
Stock return volatility mediates the relationship between earnings per share and stock return	**Accepted****
Stock return volatility mediates the relationship between book value per share and stock return	**Accepted***
Stock return volatility mediates the relationship between price earnings ratio and stock return	**Accepted***
Stock return volatility mediates the relationship between price-to-book value and stock return	Rejected

Note: ***** Full mediation, ****** partial mediation

5.4 Mediation Analysis Summary

The mediation analysis was carried out to test the third hypothesis (H_3) "Stock price and return volatility mediates the relationships between accounting and market indicators and stock price and return". The analysis concluded that the volatility of stock price and return could mediate the effects of accounting and market indicators on stock price and return. Therefore, the hypothesis (H_3) can be accepted. At the same, the findings also answered the third research question: "What is the mediating effect of stock price and return volatility on the relationships between accounting and market indicators and stock price and return?" It was found that stock price and return volatility could mediate the effects of accounting and market indicators on stock price and return. That is, the third research objective was achieved. The conclusion of research analytics has been provided in the following section.

5.5 Conclusion

The findings of the current research have extended the examination of how stock prices and stock returns of ASE Index companies react to changes in the accounting and market indicators. In addition, it has identified the indicators that could discriminate between performing and underperforming companies. It has also conducted new investigations to investigate the mediation effect of stock volatility on the relationships between accounting and market indicators and company performance. The following table summarises the findings of the study.

Table 5.53: Conclusion of Findings

Variables	Price (P)	Return (R)	Z-Score	Price Volatility (PV)	Return Volatility (RV)
Return on Asset (ROA)	(+) ve	(+) ve	–	(+) ve Partially	(-) ve Partially
Return on Equity (ROE)	–	–	–	–	–
Net Profit Margin (NPM)	–	–	–	–	–
Current Ratio (CR)	–	–	–	–	–
Debt Ratio (DR)	(+) ve Marginal	(-) ve	–	–	(-) ve Full
Total Asset Turnover (TOA)	(-) ve	(+) ve	(-) ve	–	(-) ve Full
Market Capitalisation (MC)	(+) ve	–	–	(+) ve Partial	(+) ve Full
Stock Turnover Ratio (STR)	(+) ve	(+) ve	(+) ve	(+) ve Full	(+) ve Full
Earnings Per Share (EPS)	(+) ve	(+) ve	(+) ve	(+) ve Partial	(-) ve Partial
Book Value Per Share (BPS)	(+) ve	(-) ve Marginal	–	–	(-) ve Full
Price Earnings Ratio (PER)	–	–	–	–	(-) ve Full
Price-to-book Value (PBV)	–	(+) ve	–	–	–

There were seven indicators that explained the variance in stock price; seven indicators that explained the variance in stock return; and three indicators that distinguished between performing and underperforming companies. Price volatility mediated the effects of four indicators towards stock price, while return volatility mediated the effects of eight indicators on stock return. Surprisingly, the relationship direction of certain indicators, such as TOA, differed according to the measure of performance. Other indicators, such as MC, had significant relationships with stock price, but not with stock return. The reason is perhaps the persistent performance decline of the ASE during the study period. Table 5.53 also shows the most important indicators to affect company performance. To illustrate, STR had a positively significant impact towards stock price and return; it could discriminate between performing and underperforming companies; and volatility fully and positively mediated the effects of STR on stock price and return. These results suggests that STR is the most important determinant of performance of ASE Index firms. It is considered to be a measure of stock liquidity in ASE. Usually, higher STR indicates better stock performance. The results of this study are supported by the economic theory, which indicates that stock performance has a significant impact on price, return, and performance of ASE firms. In addition, the results showed that the decisions of ASE investors were largely reflected in the relationship between STR and price, return, and performance. The next chapter will discuss the key contributions, summary of findings, and present the conclusions and implications of the research.