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Effects of Key Contingent Financial Factors on Stock Price Volatility of Iranian Petroleum Companies

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Highlights

- The effects of critical contingent variables such as changes in equity, credit rating, and asset price growth on stock price volatility of Iranian petroleum companies are determined;
- There is a significant negative relationship between credit rating and stock price volatility;
- There is no significant correlation between changes in equity and stock price volatility;
- There is no significant relationship between asset price growth and stock price volatility.

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Abstract

What factors affect companies' stock prices and how such factors cause stock price fluctuations over time in the capital markets have always been a challenging question for financial analysts, investors, and activists in the capital market. Therefore, this research aims to determine the effects of critical contingent variables such as changes in equity, credit rating, and asset price growth on the stock price volatility of petroleum companies listed on the Tehran Stock Exchange (TSE). Financial data for this study were collected from a sample of 91 companies for 8 years from 2014 to 2021, and research hypotheses were tested using the multivariate regression models and ordering panel data with fixed effects tests. The results showed a significant negative relationship between credit rating and stock price volatility. However, there was no significant correlation between changes in equity and stock price volatility. Further, there was no substantial relationship between asset price growth and stock price volatility.

Keywords: Assets Price Growth, Changes on Equity, Credit Rating, Stock Price Volatility

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1. Introduction

The stock exchange is one of the most critical institutions in the capital market and plays a significant role in the country's economy. About the novelty of the capital market in Iran, identifying relationships and factors affecting it, such as credit ratings, changes in equity, asset price growth, and their impact on stock price volatility, can help attract investors. Concerning the importance of this issue and the lack of research exploring the relationship between these factors comprehensively, the present study seeks to answer the question of whether changes in equity, credit ratings, and asset price growth influence the stock price volatility of the petroleum companies listed on Tehran Stock Exchange or not.

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2. Theoretical foundations and literature review

The growth of companies' credit rating is an essential and fundamental factor in investment and investors' decision-making (Comte and Lieberman, 2003). Smith and Bergmann (1997) concluded that the company's affordability and, consequently, credit rating should be increased to achieve a high level of liquidity, and this would be possible by conducting high advertisements for company sales. Growth opportunities are a driving force motivating and rewarding investors (Oxman et al., 2013). Furthermore, the increase and decrease in companies' cash flow ratios is an influential factor in increasing stock variation (Shivdasani and Stefanescu, 2010). The variables used in this study will be explained in the following sections.

Bohl et al. (2009) investigated the relationship between institutional investors and the volatility of stock returns. Their results showed that the increase in institutional investors' ownership fixated the stock return volatility.

Chen et al. (2013) investigated the impact of institutional ownership on stock price volatility in Chinese companies. The results showed that foreign institutions' share ownership increased the company's stock returns volatility. Moreover, the results indicated that institutional ownership strongly increased the return volatility and liquidity's effect on price volatility.

Schreiber et al. (2014) investigated the impact of credit ratings, equity changes, asset price growth, and risk on stock price volatility using European capital market data before and after the financial crisis. Their results showed a negative relationship between asset prices and credit risk in the pre-crisis period. Still, there was no relation between these two variables after the financial crisis. Also, the return on invested capital during the financial crisis had positively and considerably led to fluctuations in the capital market.

In their research, Dehghan Khalili et al. (2015) studied the effect of firm size on price volatility for earning per share ratio and market return using a nonlinear panel integration model in petroleum companies listed on the Tehran Stock Exchange. The first hypothesis suggested a significant relationship between the firm's size in the price volatility for the earning per share ratio and the market return through the nonlinear panel model. The result of the second hypothesis indicated an inverse relationship between market volatility and return due to stock price volatility based on the integration model of nonlinear panel data.

Bani Assadi and Abedini (2016) investigated the impact of credit ratings, equity changes, stock price volatility, and asset price growth on firms' credit risk. Their results indicated a significant and reverse relationship between credit rating and credit risk. At the same time, there was a substantial and direct relationship between equity changes, stock price volatility, and asset price growth with corporate credit risk.

Javadi, Ghanbari, and Anisi (2018) investigated the effects of some recognized factors that affected the performance of distributing gas companies in Iran and ranked them based on those factors. In another study within the oil industry, Javadi, Alimoradi, and Ashtiani (2017) found that firm growth, Tobin's Q, and financial leverage had positive relationships among oil and gas companies within the organization of the petroleum exporting countries (OPEC).

2.1. Stock price volatility

Volatility or variability is a tool to show the degree of uncertainty about future variations in stock returns. Whenever the degree of variability increases, the likelihood of a decrease or increase in stock prices increases. To estimate the volatility of the price of a share in the empirical process, it is necessary

to examine the stock price at specified and constant periods (i.e., every day, every week, every month, or year). In this research, the highest price per share during a specified year and the lowest share price during the same year were used to calculate the volatility of the annual stock price of a share. The volatility of stock prices equals the stock price growth rate calculated by Nini et al. (2007).

2.2. Credit rating

Credit rating is the official theory denounced by credit rating companies about the credibility of governments, institutions, governmental organizations, financial institutions, and economic agencies. The credit rating provides the required basis for comparing the credit risk of an economic firm with that of other economic agencies.

2.3. Equity changes

The equity structure is a combination of debt and corporate equities for long-term financing of assets. The most critical issue in equity structure is determining a suitable and desirable ratio for debt and equity because it directly affects the stock market value of companies in the stock exchanges. Many theories have shown that a change in the equity structure is equal to a change or revision in the value of a company that should affect the company's stock values (Hussein and Gull, 2011). The equity structure is the balance between debt and assets, the nature of assets, and the combination of corporate borrowing. This research calculates equity changes by the ratio of net changes in total investment value (Khalili et al., 2015).

2.4. Assets price growth

An asset is the future economic benefits of past events owned by a single commercial entity or natural person. Asset items include cash, current assets other than cash, and fixed assets. The growth of assets is the difference between the assets of the current year and the assets of the previous period. The asset difference is divided over the last period for relativization.

Tong Yao et al. (2011) evaluated the effect of asset growth on stock returns in 9 Asian countries between 1981 and 2007. They concluded that there was a significant and reverse relationship between stock returns and asset growth.

2.5. Institutional ownership ratio

The institutional ownership ratio equals the percentage of shares held by public and governmental companies to the total equity shares. This variable has been used with the exact definition in research done by Sung et al. (2008), Kavida and Siwakumar (2009), and Ericsson and colleagues (2013). Institutional shareholders typically hold a large share of the company's shares concerning minor shareholders. Ownership ratios incorporate different effects on performance, how to reflect information, and how to relate information of companies.

2.6. Non-executive member of directors' ratio

Non-executive directors are independent from the company's management. When the independent board includes a high percentage of non-executive members, they are more effective in performing their supervisory role, and corporate performance will improve (Moult and Donaldson, 1998).

2.7. Standardized cash flow ratio

The standardized cash flow ratio equals the change in net profit before extraordinary items compared to the previous year plus the total accrual items. The results of Salehinejad (2016) indicate a direct and significant relationship between standardized cash flows and the financial performance of corporations.

2.8. Financial leverage

Financial leverage has a specific place in the management of the capital structure. The financial leverage equals the total debt's value to the total assets' book value. Today, credit rating companies depend to a large extent on their financial leverage (Smith et al., 1997).

2.9. Firm size

The firm size is the size and volume of the company's activity. Different criteria, such as sales or total assets, are used to measure the size of a company. In most studies, company assets have been used as an indicator of size. According to accounting standards, asset valuation is possible in various ways, such as replacement value method, conventional value, and book value (historical cost). In this research, the firm's size equals the natural logarithm of the total book value of the company's assets (Sung et al., 2010).

3. Research hypotheses

Considering the theoretical foundations, literature review, and objectives of this research, the following hypotheses are developed:

Hypothesis 1: There exists a significant relationship between credit rating and stock price volatility;

Hypothesis 2: There is a significant relationship between changes in equity and stock price volatility;

Hypothesis 3: A significant relationship exists between asset price growth and stock price volatility.

4. Research methodology

This research method is correlated in nature and content and has been done in the inductive–deductive reasoning framework. At first, the correlation between the research variables was tested. Then, concerning the presence of the correlation estimated between the study variables, multiple regression models are developed based on panel data analysis.

The required data for this research were collected from the petroleum companies on the Tehran Stock Exchange. In this research, 91 companies were selected using systematic deletion methods. Fisher's statistics (F) was used at 95% confidence to test the fitted regression model's significance. Also, to test the lack of correlation between the model's errors, the Watson camera test was utilized. Further, using the multivariable regression method, the error component curve was drawn in the regression model to verify the normality of the error components. The hypotheses were tested using linear regression.

4.1. Research variables and the way of their calculation

4.1.1. Stock price volatility ($\Delta \sum \boldsymbol{B}\, \boldsymbol{H}_{i,t}$)

In this research, the stock price volatility equals the stock growth rate and is calculated according to Nini et al. (2007) and Kamble et al. (2010) as follows:

$\Delta \sum B\, H_{i,t}$: Stock price volatility with respect to the year before current year for company *i* in year *t*

$P_{i,t}$: Stock price for company *i* in year *t*

$P_{i,t-1}$: Stock price or company *i* in the year before the studied year

4.1.2. Credit rating ($X_{i,t}$)

This research measured credit ratings through a multi-criteria decision-making model using the TOPSIS method and the Shannon entropy method weighting. Companies were divided into two groups: high-credit-rating and low-credit-rating companies. The higher rating of companies reflects their higher creditworthiness. Therefore, companies with a high credit rating (46th and higher) took one value; otherwise, they took zero value.

4.1.3. The changes on equity ($\Delta Vec(E)_{i,t}$)

The following formula is used to calculate the changes in equity:

$$\Delta Vec(E)_{i,t} = \frac{TA_{i,t} - TD_{i,t}}{TA_{i,t-1} - TD_{i,t-1}}$$

where $TA_{i,t}$ is the total assets of the company in the current year, $TD_{i,t}$ indicates the total debts of the company in the current year, $TA_{i,t-1}$ denotes the total assets in the year before the current year, and $TD_{i,t-1}$ is the total debts in the year before the current year.

4.1.4. Asset price growth ($\Delta NLA_{i,t}$)

According to Rezaei and Sayari (2015), the asset price growth is calculated by:

$$\Delta NLA_{i,t} = \frac{TA_{i,t} - TA_{i,t-1}}{TA_{i,t-1}}$$

where $TA_{i,t}$ is the total assets of the company in current year, and $TA_{i,t-1}$ denotes the total assets in the year before the current year.

4.1.5. Institutional ownership ratio ($WN_{i,t}$)

The institutional ownership ratio equals the percentage of shares held by public and governmental companies to the total equity shares.

4.1.6. Non-executive member of directors' ratio ($BS_{i,t}$)

According to Smith and Bagman (1997), the non-executive member of directors' ratio is calculated by:

$$BS_{i,t} = \frac{\text{Non} - \text{executive members of directors}}{\text{Total members of board}}$$

4.1.7. Standardized cash flow ratio ($CC_{i,t}$)

Standardized cash flows are calculated as follows:

$$CC_{i,t} = E_{i,t} + TACC_{i,t}$$

$$TACC_{i,t} = \Delta TA_{i,t} + \Delta CASH_{i,t} - \Delta TL_{i,t} + \Delta PS_{i,t}$$

where $CC_{i,t}$ is equal to the cash acquired from the operation, $E_{i,t}$ equals changes in net profit before extraordnary items compared to the previous year, $TACC_{i,t}$ is equal to the sum of accrual items, $\Delta TA_{i,t}$

equals the growth rate of assets, $\Delta CASH_{i,t}$ is equal to the growth rate of the company's cash, $\Delta TL_{i,t}$ equals the growth rate of the debts, and $\Delta PS_{i,t}$ is equal to the growth rate of stock trading.

4.1.8. Growth rate of assets ($\Delta TA_{i,t}$)

$$\Delta TA_{i,t} = \frac{TA_{i,t} - TA_{i,t-1}}{TA_{i,t-1}}$$

where $\Delta TA_{i,t}$ is the growth rate of the assets of company *i* in year *t*, $TA_{i,t}$ indicates the total assets of company *i* in year *t*, and $TA_{i,t-1}$ denotes the total assets of company *i* in year *t* – 1.

4.1.9. Growth rate of cash ($\Delta Cash_{i,t}$)

$$\Delta Cash_{i,t} = \frac{Cash_{i,t} - Cash_{i,t-1}}{Cash_{i,t-1}}$$

where $\Delta Cash_{i,t}$ is the growth rate of cash of company *i* in year *t*, $Cash_{i,t}$ indicates the cash of company *i* in year *t*, and $Cash_{i,t-1}$ denotes the cash of company *i* in year *t* – 1.

4.1.10. Growth rate of debts ($\Delta TL_{i,t}$)

$$\Delta TL_{i,t} = \frac{TL_{i,t} - TL_{i,t-1}}{TL_{i,t-1}}$$

where $\Delta TL_{i,t}$ indicates the growth rate of debts of company *i* in year *t*, $TL_{i,t}$ represents the debts of company *i* in year *t*, and $TL_{i,t-1}$ indicates the debts of company *i* in year *t* – 1.

4.1.11. Growth rate of stock trading ($\Delta PS_{i,t}$)

$$\Delta PS_{i,t} = \frac{PS_{i,t} - PS_{i,t-1}}{PS_{i,t-1}}$$

where $\Delta PS_{i,t}$ is the growth rate of stock trading, $PS_{i,t}$ denotes the stock trading of company *i* in year *t*, $PS_{i,t-1}$ is the stock trading of company *i* in year *t* – 1.

4.1.12. Financial leverage ($LNH_{i,t}$)

The financial leverage ratio is calculated by:

$$LNH_{i,t} = \frac{\text{book value of total debts}}{\text{book value of total assets}}$$

4.1.13. Firm size ($LnS_{i,t}$)

The firm size equals the natural logarithm of the total book value of the company's assets (Sung et al., 2008).

4.2. Research model

The following statistical model (Schreiber et al., 2014) was used for hypotheses testing.

$$\Delta BH_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 \Delta Vec(E)_{i,t} + \beta_3 RRY_{i,t} + \beta_4 \Delta NLA_{i,t} + \beta_5 WN_{i,t} + \beta_6 BS_{i,t} + \beta_7 CC_{i,t} + \beta_8 LNH_{i,t} + \beta_9 LNS_{i,t} + \varepsilon_{i,t}$$

where $\boldsymbol{\varepsilon_{i,t}}$ is the random errors of company *i* at the end of year *t*.

Table 1

Variables definitions and calculations

Type	Variable sign	Variable definition	Variable calculation formula
Dependent	$BH_{i,t}$	Stock price volatility	$\frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$
Independent	$X_{i,t}$	Credit rating	Multiple criteria decision-making model using TOPSIS and Shannon entropy weighting methods
	$\Delta Vec(E)_{i,t}$	Changes on equity	$\frac{TA_{i,t} - TD_{i,t}}{TA_{i,t-1} - TD_{i,t-1}}$
	$\Delta NLA_{i,t}$	Assets price growth	$\frac{TA_{i,t} - TA_{i,t-1}}{TA_{i,t-1}}$
Control	$WN_{i,t}$	Institutional ownership percentage	Percentage of shares owned by governmental and public companies of total capital
	$BS_{i,t}$	Non-executive member of directors' ratio	$\frac{\text{Number of non} - \text{executiv member of directors}}{\text{Total number of non} - \text{executive member of directors ratio}}$
	$CC_{i,t}$	Standardized cash flow ratio	$E_{i,t} + TACC_{i,t}$
	$LNH_{i,t}$	Financial leverage	$\frac{\text{Total book value of debts}}{\text{Total book value of asset}}$
	$LNS_{i,t}$	Firm size	Natural logarithm of total assets
	$\varepsilon_{i,t}$	Error	Random error

4.3. Research theoretical framework

The basic design of the theoretical framework used in this study was initially derived from the work of Schreiber et al. (2014). It was then modified, and other control variables that seemed more influential in Iran's context were added to the model. The final verified theoretical framework is shown in Figure 1.

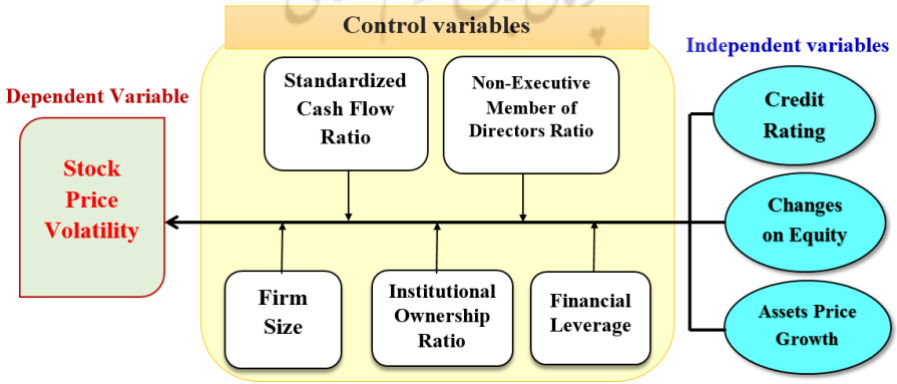

Figure 1

The developed theoretical framework of the research

5. Descriptive statistics

The descriptive statistics of the research variables comprise three distinct parts: central parameters (maximum, minimum, and mean), dispersion parameters (variance and standard deviation), and skewness and stretch coefficients. In the variables of this research, the credit rating, the institutional owners' ratio, the ratio of the non-executive members of directors, and the financial leverage variables have skewness toward the left. In other words, the data density tends to be on the left side. The stretch coefficient of most variables is more than 3, indicating that the extension and stretch in the distribution of these variables are longer than the standard normal distribution. Further, the least amount of dispersion is related to the asset price growth variable, with a value of 17.258.

Table 2

Descriptive statistics of all research variables

Variable	Variables sign	Observation	Mean	Median	Standard deviation	Skewness	Kurtosis	Min	Max
Stock price volatility	*BHΔ*	728	0.256	0.005	0.825	3.143	8.194	–0.972	3.762
Credit rating	*X*	728	0.505	1.000	0.500	–0.022	1.000	0.000	1.000
Changes on equity	*ΔVec (e)*	728	1.237	1.122	0.658	1.852	15.991	–1.889	4.828
Assets price growth	*ΔNLA*	728	0.179	0.148	0.247	2.522	17.258	–0.314	2.168
Institutional ownership ratio	*WN*	728	74.727	78.742	17.586	–1.555	5.937	5.629	100.000
Ratio of non-executive members of directors	*BS*	728	0.578	0.600	0.145	–0.063	2.485	0.167	0.833
Standardized cash flow ratio	*CC*	727	2.657	0.700	6.246	2.725	10.726	–4.091	27.627
Financial leverage	*LNH*	728	0.617	0.637	0.181	–0.343	3.021	0.013	0.984
Firm size	*LNS*	728	27.363	27.269	1.406	0.775	4.424	23.637	32.253

5.1. Reliability test of research variables

In the time series and cross-sectional data, the necessary condition for testing the data is the reliability of the research variables. Therefore, to ensure the accuracy of the results at later stages, the reliability of the regression model variables has been studied using Levin, Lin, and Chui (2002) tests.

According to the unit root test of Lewin, Lane, and Chui test (2002), each variable whose significance level is less than 5% is reliable. The results of studying the reliability of the research variables using this test presented in Table 3 show that all independent and dependent variables are reliable. This means that the mean and variance of variables over time and the covariance of variables during different years have been constant. Consequently, the studied companies do not have structural changes, and using these variables in the pattern does not lead to false regression.

Table 3

Results of the reliability test of research variables

Variable	*BHΔ*	Δ *Vec (E)*	Δ *NLA*	*WN*	*BS*	*CC*	*LNH*	*LNS*
Test Statistic	–19.968	–17.847	–18.486	–266.629	–7.403	–26.874	–21.778	–20.133
Confidence Interval	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Result	Reliable	Reliable	Reliable	Reliable	Reliable	Reliable	Reliable	Reliable

5.2. Correlation coefficients

The Pearson correlation coefficient expresses the linear relationship between two variables. As shown in Table 4, the correlation coefficients between the research variables indicate that they are not highly dependent on each other, affecting the results and causing colinearity.

Table 4

Results of the correlation coefficients test

Variable	*BHΔ*	*X*	Δ *Vec (E)*	Δ *NLA*	*WN*	*BS*	*CC*	*LNH*	*LNS*
BHΔ	1.000								
X	–0.087**	1.000							
ΔVec (E)	0.217*	–0.161*	1.000						
Δ NLA	0.238*	–0.127*	0.468*	1.000					
WN	–0.027	–0.023	–0.042	0.014	1.000				
BS	0.019	–0.022	–0.065***	0.021	–0.107*	1.000			
CC	0.058	–0.014	0.168*	0.076**	0.086**	–0.016	1.000		
LNH	0.019	0.437*	–0.314*	–0.128*	0.220*	–0.057	–0.045	1.000	
LNS	0.057	0.062	0.085**	0.175*	–0.055	0.028	–0.088**	0.157*	1.000
Significance Level	***Significance level = 90%				**Significance level = 95%			*Significance level = 99%	

5.3. Colinearity test

The collinearity implies a strong relationship between the independent variables tested by the VIF statistic. The values less than 10 for this statistic confirm the absence of a colinearity between independent variables. The results of the colinearity test are presented in the table concerned with testing the research hypotheses.

5.4. Normality test of the residuals

The Kolmogorov–Smirnov test was used to examine the normality of the model's residuals. If the significance level of the Kolmogorov–Smirnov statistics is more than 5%, the distribution of residuals can be assumed as usual. Table 5 shows that the dependent variable follows a normal distribution.

Table 5

Results of the normality test of the residuals

	Stock Price Volatility (DBH)
Z-statistic value	1.255
Significance level	0.103

5.5. Test results of research hypotheses

Before fitting the research model, it is necessary to perform the F Lemmer diagnostic test to choose between typical combined data models against the panel data model having fixed effects; the results are given in Table 6. Based on this test, if the significance level obtained from the Hasmn test is less than 5%, the zero hypotheses (random effects method) are rejected, and the fixed effects method is accepted. Because the significance level obtained from the F lemmer test is less than 5%, the zero hypothesis (the combined data) is rejected. The panel data method is accepted since the significance level obtained from the Hausman test is less than 5%, and the zero hypothesis is rejected; the fixed effects method is accepted.

Table 6

Results of F Lemmer and Husman tests

Accepted method	Significance level	Test statistic	Test type	Pattern
Panel data approach	0.0000	54.171	F-Limer	4-1
Panel data approach with fixed effects	0.0000	68.035	Hasmn	

Therefore, the panel data method with a fixed effect approach for estimating the pattern has been used. The result of the estimation of this pattern, along with the tests determining the validity of the model's residuals, has been presented in Table 7.

Table 7

Results of the research hypotheses testing

Variable	Coefficients	T-Statistic	Significance level	VIF
C	1.590	2.682	0.008	-
X	–0.180	–3.185	0.002	1.353
Δ *Vec (E)*	0.023	1.056	0.292	1.201
Δ *NLA*	–0.109	–1.495	0.135	1.321
WN	–0.004	–2.772	0.006	1.121
BS	–0.031	–0.183	0.855	1.030
CC	0.014	3.821	0.000	1.044
LNH	0.241	1.289	0.198	2.077
LNS	–0.034	–1.762	0.079	1.163
R-Squared	Adjusted R-squared	Watson camera statistics	F-Statistic	F-statistics significance level
0.369	0.355	2.251	25.938	0.000

Table 7 shows that the value of the VIF statistic for all variables is less than 5, so there is no colinearity problem between the variables. Since the amount of Watson camera statistics is between 1.5 and 2.5, the lack of correlation in the residual components confirms the above regression model. Considering the significance level of Fisher's statistic (F) is less than 1%, the significance of the whole regression is confirmed at a confidence level of 99%. The magnitude of the modified pattern correction coefficient indicates that 36% of the changes in the dependent variable can be explained by the independent and significant variables in this model.

5.6. Test of the first hypothesis

The first hypothesis examined the relationship between the companies' credit rating and stock price volatility. According to the results shown in Table 8 obtained from the model estimation, the coefficient of the credit rating variable (X) is –0.180, and according to the significance level, which is equal to 0.002 and less than the error level of 0.01, this hypothesis is confirmed at a confidence level of 0.99. Therefore, there is a negative and significant relationship between the credit rating and the stock price volatility of the companies.

5.7. Test of the second hypothesis

The purpose of the second hypothesis was to investigate the relationship between changes in equity and stock price volatility of a firm. According to the results shown in Table 8 from the model estimation, the coefficient of changes on equity variable (ΔVec (E)) is 0.023. About the significance level, which is equal to 0.292 and more than the error level of 0.05, this assumption is not confirmed at the confidence level of 0.95. Therefore, there is no significant relationship between changes in equity and stock price volatility.

5.8. Test of the third hypothesis

The third hypothesis examined the relationship between asset growth and stock price volatility. According to the results listed in Table 8 from the model estimation, the coefficient of asset price growth variable (ΔNLA) is –0.109. Regarding the significance level, which is equal to 0.135 and more than the error level of 0.05, this assumption is not confirmed at a confidence level of 0.95. Thus, there is no significant relationship between asset price growth and stock price volatility.

6. Conclusions

This study investigated the effects of changes in equity, credit rating, and asset price growth on the stock price volatility of petroleum companies listed on the TSE. The first hypothesis was not rejected, while the second and third ones were denied. It means credit rating has a negative relationship with stock price volatility. In other words, a higher credit rating for a company causes less stock price volatility. A significant correlation between changes in equity and stock price volatility was not observed. Furthermore, there needed to be a substantial relationship between asset price growth and stock price volatility. The findings of this study are consistent with the other studies mentioned previously.

Based on the results of this research, it is suggested that users of financial statements, especially investors, pay attention to the pricing of oil companies' shares when making investment decisions. In formulating the laws and regulations governing the oil companies, it is also recommended that the policymakers and stock market supervisors rate their credit so that it is possible to estimate the degree of the credit risk of the companies at any moment. This research contributed to the body of knowledge by shedding light on a phenomenon that has not been previously touched.

Nomenclature

F	Fisher's statistics
OPEC	Organization of the Petroleum Exporting Countries
TSE	Tehran Stock Exchange
TOPSIS	Technique for order preference by similarity to ideal solution

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