A consideration of firm size effect on price ratio fluctuations to earning per share and market returns using integration nonlinear panel data models

Neda Dehghan KHALILI*1, Nabiollah MOHAMMADI1, Abolfazl MOGHADDAM1, Najmeh Dehghan KHALILI4

1Department of Accounting, Zanjan Branch, Islamic Azad University, Zanjan, Iran
2Department of computer's sciences, Fasa Islamic Azad University, Shiraz, Iran

Received: 22.03.2015; Accepted: 29.05.2015

Abstract. The present study aimed to determine the effect of firm size on price ratio fluctuations to earning per share and market returns based on co integration nonlinear panel data model. The method it was descriptive and applied considering in panel data analysis. In this study, financial data of 109 companies listed in Tehran Stock Exchange were checked through 2008 to 2013. To analyse the obtained results, Minitab 16, Eviews 7 and Spss 20 soft ware are used. The first hypothesis result showed that there was a significant relationship between the effect of firm size on price ratio fluctuations to earnings per share and market returns based on co integration nonlinear panel data model. Finally considering second hypothesis, analysis we concluded that there was a significant and reverse relationship between estimating the volatility of firm size and volatility of market returns resulting from stock price of firms based on co integration nonlinear panel data model.

Keywords: Firm size, price to profit ratio, stock, returns, panel data

1.INTRODUCTION

The size of firms is one of the effective factors regarding fluctuations associated with stock market returns. Holding companies exhibit flexibility more than other firms through imposed fluctuations (Disanic, 2002). Market returns resulted from economic shocks sometimes are related to key variables of firms and their industry underlying (Debondet, 2008).

The price fluctuations and the rate of stock expected returns is one of issues raised in the financial management for a long time and up to now, the effective factors influence the volume of investments fluctuations in firms have been fully not clarified, though as Black (1976) dubbed it the mystery of dividend. Book value of assets is a symbol of the firms' size as institutional basis, and the volume increase represents increasing financial power of firms in the face of unpredictable crises. Decisions about how to predict market returns held the most important firms' decisions (Bertong, 2000), hence it is not surprising that a battery of research were conducted in this regard. Fluctuations related to firms market values are subjected to factors such as Systemic risk, the amount of dividends and firms credit rating (Dmytro and Jain, 2008).

Dividends paid are derived from the actual stock returns in previous periods and fluctuations in the expected return on the stock are derived from fluctuations of market value of the firm (for example, Chen and chin, 2011).

The ratio of price to dividend represents expected return for the injected asset that normal stock holders will receive from the firm in future (Brek, 2000). Each company, which currently doesn’t pay dividends reinvests it companies to make profit, so that their ability to pay dividends in the future will increase (bulk and Vohar, 2002). The increase of stock price may result from two factors including efficiency

* Corresponding author. E-mail: N_dehghankhalili@yahoo.com

Special Issue: Technological Advances of Engineering Sciences

http://dergi.cumhuriyet.edu.tr/ojs/index.php/fenbilimleri ©2015 Faculty of Science, Cumhuriyet University
maximization or changes made in relation to economic shocks. Basically investors invest to earn good returns and earning a dividend is a way to gain returns (Dymson et al., 2002).

Dividend policy can be defined as balance agent of the company's retained earnings on one hand and payment in cash and issued new shares, on the other (Amolzade, 2011). Also owing to the extent and depth of the market, there are various instruments for investment in the financial markets. Investors invest mainly considering the expected returns and stock market returns and risk assets (Amermon and Paterson, 2003). One of the factors affecting the stock market returns is recession or boom in the market due to factors such as systemic risk, volatility of market value and book value of the company (Amsterdam and Ordoo, 2008). Market downturn is referred to when the average market return in a year is less than the rate of inflation in the same year (Cholia et al, 2010), Accordingly market boom comes when average expected return on the market in the same year is more than the inflation in that year (Heerin, 2011). So the companies will resist the created shocks such that the size and extent of their financial backing is stronger than other companies. Firms which are in market returns recession are other controversial topics in the world today.

Due to its significance, this article seeks to check the effect of firm size on fluctuations to ratio of price to each share profit and firm returns.

**Literature Review**

- Ahmad Poorkasgari (2012), in his research entitled The effect of financial leverage and operating leverage considered financial leverage, operational and firm size effects on systematic risk through 1991-1995. The results showed that there was a significant relationship between the systematic risk and financial leverage –i.e-an increase in financial leverage, resulted in an increase of systematic risk of the firm.
- Zivdari (2010), investigated the relationship between turnover, share price and return volatility using 15 data Exchange from four of the 50 firms listed on the Stock Exchange through 27.03.2004 to 01.06.2005. The research confirmed the simultaneous relationship between trading volume and stock price changes as well as simultaneous relationship between volume and absolute change in stock price, however the hypothesis that turnover would explain the volatility of returns and simultaneously information would enter the market wasn’t confirmed.
- Nicolas et al(2012), studied the effect of company characteristics (size, interest coverage ratio, quick ratio and growth) on the capital structure of listed companies on the Greece Stock Exchange and concluded that capital structure had negative relationship with an interest coverage ratio, growth and quick ratio along with a positive relationship with the size of firm.
- Cameron Trung (2011), considered relationship between return and per share earnings using company measures the cost of transactions and P / E Ratio. The results showed that these standards were effective on company performance.
- Polt and Wilson (2010) studied the relationship between the average correlation and stock market returns. They found that changes in variance of the stock market return a little could be associated with the risk of accumulation of abnormal stock returns. Also the average correlation between daily returns stock market abnormal returns through four months might be predicted.

**Research Hypothesis**

1. There is a significant relationship between the estimated size fluctuations and volatility of price to earning per share based on co-integration nonlinear panel data model.
2. There is a significant relationship between the estimated size fluctuations and market return fluctuation resulted from stock prices of firms based on cointegration nonlinear panel data model.
A consideration of firm size effect on price ratio fluctuations to earning per share and market returns using integration nonlinear panel data models

METHODOLOGY

It was descriptive- co relational as well as applied study.

Statistical Population

The study frame included all companies listed in Tehran Stock Exchange for a six-year period through 2008 to 2013. According to the official website of the Stock Exchange of Tehran all accepted firms until the end of 2013 encompassed 520 firms in 37 industrial groups. The sampling method was screening method (FA) Considering the following criteria, 109 firms were chosen as follows:

1- Considering the required information from 2008, the firms were accepted in Tehran stock exchange by the December, 2007 and their names were not removed from the above –mentioned firms.
2- During the related period, their stocks actively traded on the exchange.
3- For increasing comparability of surveyed companies their financial period must have been ended till March the 29th and have not changed their financial terms, in the study period.
4- Not having the membership of financial intermediation firms (investment, holding, leasing and banking and insurance) because of the difference in their performance.
5- The required information must be available.

Data collecting method

Since the data on the variables in this study included many of items included in the audited financial statements of firms, The required data for testing hypothes is were collected manually from financial and reliable statements of Research Web sites, Securities and Exchange Organization of Islamic studies (www.rdis.ir) codal network, publishers comprehensive information systems(www.codal.ir) Iran processing of financial information center ( www.fipiran.com) stock Exchange CDs. Also, the other required information about the company’s financial statements was collected in pdf and excel formats from stock exchange database. This information included profit & Loss, Balance Sheet, Cash Flow Statements and....

Variables and the way of their calculation

In this study, variables were classified into three groups:

1. Operational definition of dependent variables:
1-1- Volatility of prices to earnings per share (\( \Delta PE_{i,t} \)):

According to research and Dmytro Jay (2008) the price to earnings per share is calculated as follows:

\[
PE_{i,t} = \frac{P}{E}
\]

That is:

E= the stock price at the end of study year
E= Profit of each share (EPS) at the end of study year

And following volatility of prices to earnings per share will be calculated as follows:

\[
\frac{PE_{i,t} - PE_{i,t-1}}{PE_{i,t-1}} \Delta PE_{i,t}
\]

\( \Delta PE_{i,t} = \text{Volatility of prices to earnings per share of firm i in year t} \)

\( P_{i,t} = \text{Ratio of price to earnings per share of firm i in year t} \)

\( P_{i,t-1} = \text{Ratio of price to earnings per share of firm i in year t-1} \)

1-2- Volatility of stock market returns based on the price (\( \Delta SP_{i,t} \)):
Presenting capital asset pricing model (CAPM), sharp emphasized that returns on the stock market or unique was equal to the return on a risk-free asset addition to the relative risk securities ($\beta$) multiplied by the difference between the portfolio return minus the risk-free return on assets, as following (Heeren, 2011):

$$SP_{it} = r_f - \beta_i (r_m - r_f)$$

$E_{ri}$ = stock market return

$r_f$ = Risk-free return on a share

$\beta_i$ = The relative risk of securities

$r_m$ = Rate of return on the market portfolio

Rate of return on the portfolio (total return) is obtained from Total changes in price and dividends paid with respect to the amount to be paid as capital.

$$rm = \sum c_{i,t}D_{i,t} - \sum x_{i}p_{i,t} + \frac{TEP_t - TEP_{t-1}}{TEP_{t-1}}$$

$TEP_t$ = Stock index at the end of the day

$TEP_{t-1}$ = Stock index on the first of day

$X_iP$ = Cash earned on capital increase

$C_i$ = Number of shares in the period

$D_{it}$ = per share cash dividends

$p_{it}$ = The price of shares in the period

$t$ = The study period

And market return fluctuations based on share price is calculated as follow:

$$\frac{SP_{i,t} - SP_{i,t-1}}{SP_{i,t-1}} \Delta SP_{i,t}$$

$\Delta SP_{i,t}$ = Volatility of market returns on the stock price of firm i in year t.

$SP_{i,t}$ = Market returns based on the stock price of firm i in year t

$SP_{i,t-1}$ = Market returns based on the stock price of firm i in year t-1

2. Operational definition of the independent variable

2-1- estimating firm size fluctuation ($\Delta SIZE_{i,t}^+$):

According to Hayrn (2011), the volatility of the firm size is estimated through the following model:

$$SIZE_{ij}^+ = \sum_{k=1}^{t} \Delta SIZE_k^+ = \sum_{k=1}^{t} \max(\Delta SIZE_k^+ , 0)$$

$$and SIZE_{ij}^- = \sum_{k=1}^{t} \Delta SIZE_k^- = \sum_{k=1}^{t} \min(\Delta SIZE_k^- , 0)$$

That:

$\Delta SIZE_k^+$ = Fluctuations of firm's size based on the book value in the current year

$SIZE_{ij}^-$ = Fluctuations of firm size on the basis of expected market value in the current year

3. Operational definition of control variables

3-1- investing opportunities ($BMV_{i,t}$):

Growth opportunities as Dibonnet study (2008), indicated is calculated as follows:

The total market value of the Company's shares

$$BMV_{i,t} = \frac{\text{Book value of total shares}}{\text{shares}}$$
A consideration of firm size effect on price ratio fluctuations to earning per share and market returns using integration nonlinear panel data models

3-2- the firm size in proceeding year \((SIZE_{t,j,-1})\):

Equal to logarithm of the book value of total assets in preceding year (Cholia et al., 2010)

3-3- Volatility cumulative firm size \(\left(\sum_{k=1}^{P} (\Pi_{k}^{+}SIZE_{i,t} + \Pi_{k}^{-}SIZE_{i,t-1})\right)\)

According to Chen and Chin 2011, Volatility cumulative size of the company is fulfilled through the following model:

\[ Y = \sum_{k=1}^{P} (\Pi_{k}^{+}SIZE_{i,t} + \Pi_{k}^{-}SIZE_{i,t-1}) + \epsilon_{i,t} \]

That
\( \Pi_{k}^{+}SIZE_{i,t} = \) The rate of assets increase in current year
\( \Pi_{k}^{-}SIZE_{i,t-1} = \) Rate of increase asset in prior year

3-4- Deviations Corporate Risk \((\delta_{i,t})\):

**CAPM** says that expected rate of return firm is equal to Safe rate of return plus a risk premium that is shown as follows: (Amsterdam and Ordoo, 2008)

\[
E(R_{i}) = R_{f} + \left[ E(R_{m}) - R_{f} \right] \beta_{i} \]

\( R_{f} = \) Rate of return of firm \(i\) in the period \(t\)

\( \Rightarrow R_{i}^{t} = R_{i}^{t} + (R_{m}^{t} - R_{f}^{t}) \beta_{i} + \epsilon_{i,t} \)

\( \beta_{i} = \) Securities market beta (systematic risk) firm \(i\).

\( R_{m} = \) Rate of return on the market portfolio in period \(t\)

\( \epsilon_{i,t} = \) Disturbing factors

It should be noted that returns in the stock market are used to measure the systematic risk Information on securities and portfolio. The following formula is used to measure the actual output with the Stock Exchange.

\[
R_{i}^{t} = \frac{(P_{i,t} - P_{i,t-1}) + DPS + (P_{i,t} - 1000)A + P_{t}B \times 100}{P_{i,t-1}} \]

Such that:

\( P_{i,t} = \) The stock price at the end of year \(t\)

\( P_{i,t-1} = \) The stock price at the end of \(t-1\).

\( DPS = \) Dividend per share based on the number of shares at the beginning of period.

\( A = \) Percent increase in investment of cash received

\( B = \) Percent increase in capital from retained earnings and reserves.

Accounting beta (systematic risk) is expected to be calculated with this equation:

\[
\beta_{i} = \frac{COV(R_{i},R_{m})}{VAR(R_{m})} \]

\( \beta_{i} = \) Rate of return of firm \(i\) in the period \(t\)

\( R_{m} = \) Rate of return on the market portfolio in the period \(t\)
Accounting beta is obtained by dividing the variance on co-variance in which co-variance deal comparing the changes in the two variances, check dispersion variance and finally Risk deviations are calculated as follows:

\[ COV(R_i, R_m) = \frac{\sum (R_i - \bar{R}) (R_m - \bar{R}_m)}{n} \]

\[ = E(R_i - \bar{R}) (R_m - \bar{R}_m) \]

\[ VAR(R_m) = E(R_m - \bar{R}_m)^2 \]

**Research models**

For testing hypothesis 1 and 2, we applied models 1 and 2. In this model if Coefficients \( \beta_i \) (coefficients of the independent variables) is significant 95\%, both hypothesis are confirmed. Research models derived from study by Hong et al. (2007) and the adjusted Aprks and Pany variables (2014) are estimated as follows:

Model 1:

\[ \Delta PE_{i,t} = \alpha_0 + \beta_1 \Delta^i SIZE_{i,t} + \beta_2 BMV_{i,t} + \beta_3 SIZE_{i,t-1} + \beta_4 \sum_{k=1}^{p} (\Pi_k^+ SIZE_{i,t} + \Pi_k^- SIZE_{i,t-1}) + \beta_5 \delta_{i,t} + \epsilon_{i,t} \]

Model 2:

\[ \Delta SP_{i,t} = \alpha_0 + \beta_1 \Delta^i SIZE_{i,t} + \beta_2 BMV_{i,t} + \beta_3 SIZE_{i,t-1} + \beta_4 \sum_{k=1}^{p} (\Pi_k^+ SIZE_{i,t} + \Pi_k^- SIZE_{i,t-1}) + \beta_5 \delta_{i,t} + \epsilon_{i,t} \]

Such that:

\( \epsilon_{i,t} \) = Random error of firm i in year t.

**Analysis of models and testing hypotheses**

In this study multivariate linear regression model was used to test hypotheses. Statistical methods used in this Research were panel data. Since the relationship between independent variables and the dependent variable from two different aspects were examined. Also, these variables among different companies were studied through 2008-2013. For testing hypothesis, we applied Spss 21, Eviews 7 and Minitab 16.

**Findings**

First hypothesis test results

First hypothesis Considered the relationship between estimated firm size fluctuations and volatility of prices to earnings per share based on nonlinear cointegration panel data of firms.

This hypothesis using model one estimated in panel data and in case coefficient \( \beta_1 \) was significant at 95\%, it would be confirmed.

\[ \Delta PE_{i,t} = \alpha_0 + \beta_1 \Delta^i SIZE_{i,t} + \beta_2 BMV_{i,t} + \beta_3 SIZE_{i,t-1} + \beta_4 \sum_{k=1}^{p} (\Pi_k^+ SIZE_{i,t} + \Pi_k^- SIZE_{i,t-1}) + \beta_5 \delta_{i,t} + \epsilon_{i,t} \]

(1)
A consideration of firm size effect on price ratio fluctuations to earning per share and market returns using integration nonlinear panel data models

\[
\begin{align*}
H_0 : \beta_1 &= 0 \\
H_1 : \beta_1 &\neq 0
\end{align*}
\]

To see whether using panel data estimation module would be effective or not, Chow test or F bound was used and better estimation. Huasman test is used for The obtained results of these tests are presented in table 1.

**Table 1.** The results of Chow and Husman test for model 1.

<table>
<thead>
<tr>
<th>Test</th>
<th>number</th>
<th>statistics</th>
<th>Statistic value</th>
<th>Freedom degree</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chow</td>
<td>654</td>
<td>F</td>
<td>1/7742</td>
<td>(540,108)</td>
<td>0/0247</td>
</tr>
<tr>
<td>Huasman</td>
<td>654</td>
<td>(\chi^2)</td>
<td>2/5655</td>
<td>5</td>
<td>0/0364</td>
</tr>
</tbody>
</table>

Considering that Chow test results and the P-Value (0247/0), test hypothesis was rejected at 95%. Also according to the results of the Hausman test and P-Value (0364/0), which is less than 05/0, hypotheses testing was rejected in at %95. So it is required that the model is estimated using fixed effects.

To study validity of the model and the assumptions of the classical regression, it is needed to explore the absence of multicollinearity between the independent variables in the model, normality and homogeneity of variances, independence of residuals and the absence of clear error model (linear model). To test the normality of error terms various tests can be used. One of these tests is the test of Jarky which was used in the study as well. The result of this test showed that Residues resulting from the research model at 95% enjoyed the normal distribution. Therefore, the probability of the test (4896/0) was larger than 05/0.

One of the assumptions of the classical regression is the residual variance. If the variances are heterogeneous, linear estimate may not unbiased and will not have the minimum of variance. In this study Pagan cut test was used to test homogeneity of variance. Due to the importance of this test, which is smaller than 05/0 (0233/0), it can be said that the variance anisotropy model has a problem. In this study, to address the problem of estimating, the generalized least squares estimation method (GLS) is used. Also in this study to test the residuals correlation - which is one of the assumptions of the analysis and regression analysis - autocorrelation camera Test Watson (D-W) was used. Considering the primary results Watson camera model estimation value and was equal to 2.15 and, since it was between 1/5 and 2/5 it could be concluded that Residuals were the independent of each other. In addition, to see whether linear relationship and linear and non-linear explanation was correct or not, Ramsey test was used. Since the level of Ramsey test (7007/0) was larger than 05/0 the null hypothesis of this test is confirmed based on this fact that the model does not specify the error. The summaries of above results are presented in table 2.

**Table 2.** Tests of statistical assumptions of the model (1).

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Jarque-Bera</th>
<th>Breusch-Pagan</th>
<th>Durbin-Watson</th>
<th>Ramsey</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\chi^2)</td>
<td>1/4962</td>
<td>3/8375</td>
<td>2/15</td>
<td>8/3558</td>
</tr>
<tr>
<td>P-Value</td>
<td>0/4896</td>
<td>0/0233</td>
<td>0/364</td>
<td>0/7007</td>
</tr>
</tbody>
</table>

Considering obtained results of Chow and Husman and also the result of classic statistical assumption of the model 1, the data were estimated using panel data and fixed effects. The results are shown in table 3:

The estimated model using 7 Eviews software is presented as follows:

\[
\Delta PE_{i,t} = 0.8322 + 0.0578\Delta^{+} SIZE_{i,t} - 0.0298BMV_{i,t} - 0.0685SIZE_{i,t-1}
\]

\[
+ 0.0027\sum_{K=1}^{P}(\Pi^{+}_{K} SIZE_{i,t} + \Pi^{-}_{K} SIZE_{i,t-1}) - 0.0397\delta_{i,t} + \epsilon_{i,t}
\]

1961
Table 3. First hypothesis test results using fixed effects.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Statistic t</th>
<th>P-Value</th>
<th>Relation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed component</td>
<td>0.8322</td>
<td>6.6988</td>
<td>0.0000</td>
<td>Positive</td>
</tr>
<tr>
<td>Estimating the size of firm fluctuations</td>
<td>0.0578</td>
<td>1.6244</td>
<td>0.0449</td>
<td>Positive</td>
</tr>
<tr>
<td>Investment opportunities</td>
<td>-0.0298</td>
<td>-1.2236</td>
<td>0.2216</td>
<td>Nonsense</td>
</tr>
<tr>
<td>size of firm in the year preceding</td>
<td>-0.0685</td>
<td>-1.4594</td>
<td>0.0376</td>
<td>Negative</td>
</tr>
<tr>
<td>Volatility cumulative size</td>
<td>0.0027</td>
<td>1.1078</td>
<td>0.0141</td>
<td>Positive</td>
</tr>
<tr>
<td>Deviations risk</td>
<td>-0.0397</td>
<td>-1.8798</td>
<td>0.0307</td>
<td>Negative</td>
</tr>
<tr>
<td>Determining model coefficient</td>
<td></td>
<td></td>
<td>0.9634</td>
<td></td>
</tr>
</tbody>
</table>

F statistic: 1.9851 (0.0000)

Considering the model significance of considering that the probability of F statistics is smaller than 0.05 (0.0000), 95%, it is confirmed.

Determining factor model also suggests that 96/34% of the volatility of the price to earnings per share is explained by the variables in the model.

In checking coefficient significance considering presented results in table 3, since the probability of t-statistic for the coefficient estimates of the volatility variable size was smaller than 0.05 (0.0449), there was a significant relationship between firm size and volatility of price fluctuations in earnings per share based on nonlinear panel data cointegration companies at 95%. So the first hypothesis was accepted and it can be said that there was a significant relationship between Size and volatility of price fluctuations in earnings per share based on the accumulation of non-linear firms’ panel data model. The positive coefficient of this variable (0.0578) suggests a direct relationship between firm size and volatility of price fluctuations in earnings per share based on the accumulation of non-linear firms’ panel data model. So as volatility increases 1 unit size, Volatility of prices to earnings per share based on the accumulation of non-linear firms’ panel data model increase 0.0578 units. Therefore, as far as the 1st hypothesis is concerned we can conclude that there is a significant relationship between Estimating the size and volatility of price fluctuations in earnings per share based on the accumulation of non-linear firms’ panel data model.

The results of testing 2nd hypothesis

The goal of testing this hypothesis is that if there is a significant relationship between Estimating volatility of the firms’ size and volatility of market returns originating from firm’s stock price based on the accumulation of non-linear firms’ panel data model.

This hypothesis using model 2 is presented in panel data and if coefficient $\beta_1$ is significant in confidence level of 95% will be confirmed.

\[
\Delta SP_{i,t} = \alpha_0 + \beta_1 \Delta^+ SIZE_{i,t} + \beta_2 BMV_{i,t} + \beta_3 SIZE_{i,t-1} + \beta_4 \sum_{k=1}^{P} (\Pi^+_k SIZE_{i,t} + \Pi^-_k SIZE_{i,t-1}) + \beta_5 \delta_{i,t} + \epsilon_{i,t}
\]

(2)

\[
\begin{align*}
H_0 : \beta_1 &= 0 \\
H_1 : \beta_1 &\neq 0
\end{align*}
\]
A consideration of firm size effect on price ratio fluctuations to earning per share and market returns using integration nonlinear panel data models

The results of the Chow test (used to specify the use of panel data methods or a combination) and Hausman (in order to highlight the use of fixed or random effects methods panel data) for model 2 are presented in table 4.

Table 4. Chow and Hausman test results for model (2).

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>Statistic value</th>
<th>Freedom degree</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chow</td>
<td>$F$</td>
<td>1/3135</td>
<td>(540,108)</td>
<td>0/0277</td>
</tr>
<tr>
<td>Hausman</td>
<td>$\chi^2$</td>
<td>3/5564</td>
<td>5</td>
<td>0/0349</td>
</tr>
</tbody>
</table>

Considering Chow test result and its P-Value (0/0277), the hypothesis Test was rejected at confidence interval 95 % and Indicated that the panel data method can be used. Also according to the results of the Hausman test and P-Value (0349/0) which is less than 05/0, test the hypothesis was rejected at 95 % and the hypothesis is accepted. So the model should be estimated using fixed effects. In classical regression assumptions Jarkyv- bera test results suggested that the residues from research estimating at 95% has normal distribution, So that probability of the test (2794/0) has larger than 05/0. Also, cutting-Pagan test was smaller than 05/0 (0438/0) the null hypothesis rejected based on variance anisotropy so we can say the model has variance anisotropy problem. In this hypothesis to address the problem of estimating the generalized least squares estimation method (GLS) was used. In autocorrelation test, the camera Watson statistic (DW) was 2.27. Since it is between 1/5 and 2/5, it can be concluded that Residuals are independent of each other. Since the level of Ramsey test (0/0287) was larger than 05/0 the null hypothesis of this test is confirmed, thus the model does not specify the error. The summaries of above results are presented in table 5.

Table 5. Tests of statistical assumptions of the model (2).

<table>
<thead>
<tr>
<th>statistic Ramsey</th>
<th>statistic Durbin-Watson</th>
<th>statistic Breusch-Pagan</th>
<th>Statistic Jarque-Bera</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P-Value$</td>
<td>$F$</td>
<td>$D$</td>
<td>$P-Value$</td>
</tr>
<tr>
<td>0/0287</td>
<td>4/6700</td>
<td>2/2772</td>
<td>0/0438</td>
</tr>
<tr>
<td>0/2794</td>
<td></td>
<td></td>
<td>0/2794</td>
</tr>
</tbody>
</table>

Considering the obtained results of Chow and Husman and also the result of classic statistical assumption of the model 2 Research was estimated using panel data and fixed effects. The results are shown in table 6.

Table 6. The second research hypothesis test results using fixed effects.

| Dependent variable: volatility of market return based on the price of the stock |
|-----------------------------|-----------------|-----------------|-----------------|
| Number of observations: 654 years- firm |
| Variable                   | Coefficient    | Statistic t     | P-Value         | Relation        |
| Fixed component            | 0/0070         | 0/02230         | 0/8235          | Nonsense        |
| Estimating the size of firm fluctuations | -0/0169 | -1/6116 | 0/0376 | Negative |
| Investment opportunities   | 0/3097         | 1/4675          | 0/6872          | Nonsense        |
| size of firm in the year preceding | -0/0194 | -1/6115 | 0/0293 | Negative |
| Volatility cumulative size | 0/0361         | 1/0406          | 0/0241          | Positive        |
| Deviations risk            | 0/0046         | 1/0557          | 0/0315          | Positive        |
Determining model coefficient

<table>
<thead>
<tr>
<th>statistic $F$</th>
<th>0/8533</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P – Value$</td>
<td>7/2705</td>
</tr>
</tbody>
</table>

The model is estimated using the software 7 Eviews as follows:

$$\Delta SP_{ij} = 0.0070 - 0.0169\Delta SIZE_{ij} + 0.3097BMV_{ij} - 0.0194SIZE_{ij-1}$$

$$+ 0.0361\sum_{k=1}^{p}(\Pi_{k}^{+}SIZE_{ij} + \Pi_{k}^{-}SIZE_{ij-1}) + 0.0046\delta_{ij} + \epsilon_{ij}$$

In considering the model significance of considering that the probability of $F$ statistic was smaller than 05/0 (0000/0), the model was confirmed at 95%.

Determining factor model also suggests that 85/33% of Volatility of stock market returns based on the price variable in the model is confirmed.

Regarding coefficient significance via presented results in table 6, it was show since the probability of t-statistic for the coefficient estimates of the volatility variable size was smaller than 05/0 (00376), there was a significant relationship between estimating the size of fluctuations and fluctuations in market returns originating from the company's stock price based on the accumulation of non-linear firms’ panel data model. So the second hypothesis was confirmed and it can be said that there is a significant relationship between estimating the size of fluctuations and fluctuations in market returns originating from the company's stock price based on the accumulation of non-linear firms’ panel data model. The negative coefficient of the variable (0/0169) indicated that there was an inverse relationship between estimating the size of fluctuations and fluctuations in market returns originating from the company's stock price based on the accumulation of non-linear firms’ panel data model such that with 1-unit increase in volatility of estimated firm size, fluctuations in market returns originating from the company's stock price based on the accumulation of non-linear firms’ panel data model would decrease 0/0169 units. Therefore, considering hypothesis, we can conclude that there is a significant relationship between estimating the size of fluctuations and fluctuations in market returns originating from the company's stock price based on the accumulation of non-linear firms’ panel data model.

CONCLUSION

T-statistic for the coefficient of variation to estimate the probability of variable size was smaller than 05/0 (0449/0), Consequently, there is a significant relationship between firm size and volatility of price fluctuations in earnings per share based on nonlinear panel data cointegration firms at 95%. As a result, first hypothesis is confirmed.

T-statistic for the coefficient of variation to estimate the probability of variable size was smaller than 05/0 (0/0376), as a result there is a significant relationship between estimating the size of fluctuations and fluctuations in market returns originating from the company's stock price based on the accumulation of non-linear firms’ panel data model at 95%. Accordingly, second hypothesis was accepted.

Suggestions

1- According to the results of this research, stock exchange organization can issue more comprehensive information about Volatility of the market price to earnings per share and volatility of market return based on stock price for stock holders.
2- Recommending accounting Standards to voluntary disclosure of information about the rate of estimating the size and volatility of price fluctuations in earnings per share and return on market volatility on the stock price may be practical.
A consideration of firm size effect on price ratio fluctuations to earning per share and market returns using integration nonlinear panel data models

3- Since the increase in the level of volatility estimated size can have substantial effects on investors' decisions, complete and transparent information from the management will be effective in terms of estimating the size and volatility of price fluctuations in earnings per share and return on market volatility on the stock price.

4- Better financial active analysts in the capital markets, and investment advisors in Stock Exchange as well as analysis and in terms of volatility of price fluctuations in earnings per share and return on market volatility on the stock price and estimating the fluctuations of firms’ size considering accounting standards will be of great assistance.

REFERENCES