The study of co integration relationship among operating leverage, risk and unsystematic return in sugar companies accepted in Tehran Stock Exchange

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Abstract: Some of the effective factors in selecting and investing are risk and investment return. The role of risk and return in investment is as the role of supply and demand in economy for pricing the productions. In theoretical overview, risk is the meaning of potential losses and measurable of investment. Shares risk will be known with shares return fluctuations, because the amount of return changes identifies uncertainty of return. In this research, co integration relationship among operating leverage, risk and unsystematic return in sugar companies accepted in Tehran Stock Exchange is examined. The samples contain 17 sugar companies accepted in Tehran Stock Exchange during the period of 10 years (2004-2013). Two main hypotheses were examined in error level of 5%. The results show that all hypotheses of research are confirmed in confidence level of 95%. It indicates that there is significant andco integration relationship between operating leverage and unsystematic risk in sugar companies accepted in Tehran Stock Exchange. Also, there is significant and co integration relationship between operating leverage and abnormal return in sugar companies accepted in Tehran Stock Exchange.

Key words: Operating leverage; Risk return; Co integration relationship

1. Introduction

In each financial market with regard to the expansion and depth of market, there are varieties of tools for investment and investors select their investment due to the risk and return. Whatever markets move toward development, new tools are defined to response to investors' needs. It comes to financial literature that whatever risk caused by one asset increases, investors will expect to receive more return and ability to cash them is one of the important and effective factors on risk of assets. Whatever one share has less ability to be cash, that share will be less attractive, unless the holder has achieved higher efficiency (Yahyazade Far, 2010). Due to the risk caused by changes of illiquidity (the possibility that liquidity of assets is eliminated in market and in required time cannot be converted to cash), learning and the importance of this factor and its position is determined for investor, because each investor considers this factors one of the important criteria in evaluation in the time of investment. Experimental evidences show that this factor plays important role along with financial ratios of company in making decisions (BiadianAshoot et al., 2010). The factors that determine the risk and performance are numerous. Capital structure of company is one of these factors and operating leverage is another factor which can be effective on risk. Operating leverage shows the percentage of changes those happened in interest before profit and tax for one percent change in sell. Operating leverage

shows the effect of fix operational costs to operational profit of company. Basically, the importance of operating leverage is because of the issue that little change in sell level creates more changes in profit before profit and tax. Whatever the degree of operating leverage is bigger, the risk of prediction error of interest before profit and tax will be more and consequently, the probability that the real amount of interest before profit and tax is negative will be more (Darabi and Saeeidi, 2009). Therefore, it is attempted in this research to study the co integration relationship among operating leverage, risk and unsystematic return in sugar companies accepted in Tehran Stock Exchange to conclude that whether there is any relationship among operating leverage and risk and unsystematic return or not?

2. Theoretical framework of research

Investment can be known as the basic pillar of the economy of the country which if it is done properly, it will cause to increase national production and economic growth (Nakhjavani, 2003). The importance of the investment for economic and social growth and development is to extent that it is known as a powerful tool in achieving sustainable development and it should be reminded that considering this issue may cause to growth and development of the economy with being in positive circle, lack of attention to that can cause to drop the economy and falling into downward and negative process. Economic growth and increasing public comfort in long term, without attention to

investment and obtained important factors in investment environment which is effective on that, is impossible (Samadi et al., 2008).

The advantages of attendance in market for investors and invested companies cause them to have sufficient incentive to enter to the Stock. The main objective of investors to invest in company's shares is to increase their wealth. It is happened through gaining shares return. However, with expansion of shares market and increasing listed companies in stock, investment opportunities will increase and the problem of price changes and contracting the company's shares and deciding about optimum shares selection has been occurred.

Investment as a financial decision has had always two components of risk and return and their exchange offers various combinations of investment. On the one hand, investors are looking to maximize their income from investment and on the other hand, they face to uncertainty condition prevailing on financial markets. To persuade investors to invest, the condition should be provide to inform investors about financial markets and making decisions. Therefore, in this regard, the factors affecting on the cost and efficiency of investments are important. Investors try to estimate the amount of risk and possible investment return to create optimum investment basket by that. On the other words, all investors' decisions happen based on the relationship between risks and return (Emadzade et al., 2011).

Also, shares return fluctuation is one of the financial controversial issues which are under the attention of capital market researchers. The reason for this tendency returns to the interaction of shares return fluctuation and performance. The advantage of the study of shares return fluctuation by investors is because they consider shares return fluctuation as a criterion of risk and also the investors of capital market can use this criterion as a tool for measuring the amount of shares market vulnerability (Zafar et al., 2008).

Takamatsu and Favero (2013) in an article entitled "Accruals, earnings persistence and stock returns of public companies in Brazil" have been dealt with the study of how to estimate the various components of income and future impact on the profitability of the company's Brazilian business. The results of research show that current accruals are unable to show the future manner of unnatural return in companies those are analyzed. In addition, no considerable abnormal returns on investment strategies based on accruals can show that investors have ability to describe and pricing accounting data.

Chiou (2011) in an article entitled "Transfer volatility of stock returns across Asia, Europe and North America" has been dealt with the study of relationship among three main shares markets (Tokyo, London, New York) during the period of 1997 to 2007 by return-volatility variable. In this research, it has dealt with to this test that how one national shares market is affected by another shares market. The obtained results of this research show

that three shares market are dependent to each other considerably. Tokyo's shares market leads London's shares market and New York's shares market leads shares markets of Tokyo and London. Specifically, the relationship between shares markets of London and New York is the strongest one.

Erfani and Safari (2014) in an article have been dealt with the behavior of monthly period of shares in Tehran Stock (Bootstrapping). The results show that the average of return in year 2014 is positive and significant and it has the highest return. So, the effect of liquidity and hypothesis layout Account can be a suitable justification for existence the positive and significant effect in Tehran Stock during the period of 1992 to 2012.

3. Research method

This research is descriptive-correlation in terms of nature, because in one side, it studied the obtained situation and on the other side, it determines or discovers the relationship among different variables by analysis of regression. According the issues of research, it is functional in terms of goal. In this research, multivariate regression models are used to analyze information. Also, Excel and Eviews and Microfitsoftwares are used. Adjusted Dicky-Fuller test is also used.

3.1. Dependent variables

Unsystematic risk: To that part of the variability in the efficiency of the financial products that the market does not depend on the total variability, is called unsystematic risk. This type of risk is not limited to a particular product and it depends on factors like trading risk, financial and liquidity risks. This kind of risk can be decreased by creating portfolio. Unsystematic shares risk in current financial year measures by standard deviation of shares daily return.

Abnormal return: Following market model used to measure abnormal returns:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$$

In this model:

R_{it} = return for company i in the day of t

α_i = intercept of regression

β_i = beta of company i

R_{mt} = return based on the value of Stock index in the day of t

ϵ_{it} = the amount of error

Then, abnormal return in the day of t is calculated this way:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

AR_{it} = equal to abnormal return of company i in the day of t

Market reaction is cumulative abnormal return during 15 days after publishing calculated financial statements which is equal to

$$CAR = \sum_{t=0}^{T} AR_{it}$$

3.2. Independent variable

The operating leverage is the ratio of changes in operational interest in sell which means it shows sensitivity and changes in operational interest against changes of sell and it indicates that for one unit change in sell, in what amount change will be obtained in operational interest of the company. Therefore, whatever the operating leverage of the company is higher; it shows more sensitivity and changes in operational interest of the company for change in its sell. In this research, the ratio of fix assets to total assets is used as an independent variable to evaluate the operating leverage of the company. The ratio of fix assets to total assets is as an index to show the capacity of fix costs (operating leverage) in companies.

The statistical society of this research is sugar companies accepted in Tehran Stock Exchange. The time domain of the research is during the years 2004 to 2013.

First hypothesis: there is significant and co integration relationship between operating leverage

and unsystematic risking sugar companies listed in Tehran Stock Exchange.

Second hypothesis: there is significant and co integration relationship between operating leverage and abnormal return in sugar companies listed in Tehran Stock Exchange.

4. The results of research

4.1. The augmented dickey-fuller unit root test

According to the issue that time series are not usually stationary and this issue causes to provide spurious regression in experimental studies, therefore, the stationary of variables are examined by the augmented Dickey-Fuller Unit Root test. The summary of results of the augmented Dickey-Fuller Unit Root test has been shown in table 1. The results indicate that all variables of research are stationary. To select optimum lag, Schwartz-Bayesian criterion is used.

Table 1: The summary of results of The Augmented Dickey-Fuller Unit Root Test

Degree of integration	Critical amount	Statistical amount of test ADF	Time series	Row
(1)I	-2.9287	-6.6834	Unsystematic risk	1
(1)I	-2.9287	11.1736-	Abnormal return	2
(1)I	-2.9287	3.7716-	Operating leverage	3

4.2. Hypotheses test by vector auto-regression with distribution lags

Due to the aim of research which is the relationship among operating leverage, abnormal return and unsystematic risk, and also with regard to the difference of degree of variables integration,

therefore, with using of Microfit 4 and Schwartz-Bayesian criterion, the best model with reasonable lag is estimated by ARDL. Schwartz-Bayesian criterion saves in number of lags. As a result, estimation has more freedom degree (Pesaran, 1997). The obtained results of model estimation are as follow the table 2.

Table 2: the coefficients of adjusted model

Probability	T statistics	Standard deviation	Coefficient	Explanation variable
0.00	6.4	0.07	0.69	Unsystematic risk
0.00	0.08	8.7	0.74	Abnormal return
0.00	1.5	9.2	13.9	Operating leverage
$\overline{R}^{2} = 0.99$		PROB(F-STATE)=0.00		DW=2.17

Scalar quantity at the bottom of table (2) shows the lack of auto-correlation among the variables of the model, the lack of stipulate error of the model and lack of anisotropy variance in the model. Quantum computing of F statistics in significant level of 5% shows that total regression equation is not rejected in terms of statistics. In addition, the power of explanation model is 99%. Before estimating long term coefficient by ARDL method, to ensure of obtaining long term relationships among variables, it is required to do co integration test. To do this test, total coefficients with lag of dependent variable (RTEDIX (-1)) is deducted of number one and it is divided on total standard deviation as follow:

$$t = \frac{\sum_{i=1}^{\hat{}} \hat{\phi}_i - 1}{\sum_{i=1}^{\hat{}} S_{\phi_i}} = \frac{0.69-1}{0.07} = -4.42$$

According to the obtained absolute value of t, it is bigger than presented absolute value of critical amount by Benerji, Dola and Master (-3.9), therefore, zero hypothesis based on lack of long term relationship with confidence level of 95% is rejected. The results indicate that there is long term relationship among operating leverage, abnormal return and unsystematic risk. So, long term model is estimated by ARDL method and the summary of results has presented in table 3.

Table 3: Long term model ARDL

Probability	T statistics	Standard deviation	Coefficient	Explanation variable
0.01	2.1	0.04	-0.08	Unsystematic risk
0.00	1.01	39.4	0.012	Abnormal return
0.00	1.9	0.01	0.03	Operating leverage

According to the calculated t statistics of table 3, the coefficient of operating leverage is significant in confidence level of 95%. The description of scalar quantity of coefficient is that if operating leverage variable increases 100 units in long term, in order of 8 and 12 percent, unsystematic risk will decrease and abnormal return will increase. The reasons those can be used to explain the positive effectiveness of time process on shares abnormal return variable are the issue that the effect of operating leverage of sugar stock companies usually increases through the time.

5. Conclusion and recommendation

Recent research is following to study the co integration relationship among operating leverage, unsystematic risk and abnormal return in sugar companies listed in Tehran Stock Exchange. The results show that all hypotheses of research are confirmed in confidence level of 95%. The results indicate that there is significant and co integration relationship between operating leverage and unsystematic risk in sugar companies listed in Tehran Stock Exchange. Also, there is significant and co integration relationship between operating leverage and abnormal return in sugar companies listed in Tehran Stock Exchange. The results of this research are same as the results of Demedeiros et al. (2006) research. Capital market of Iran considers weak in terms of information efficiency. Improving controlling process, correcting rules, more stability in making policies and creating suitable work for presenting conscious information for investors can help them to improve their decisions by unofficial sources with investigating the accounting variables instead of making decision based on financial and non-financial obtained information. Therefore, it is recommended to create suitable informing system in Tehran Stock Exchange, in a way that required information for analysis should be available for investors and analyzers appropriately and timely and using of this information should not be exclusive for especial group. Also, it is recommended that financial analyzers should be more active in market to analyze information market in different dimensions and make Tehran Stock Exchange more close to efficient market.

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