



Investigation of the Relationship between Return, Risk and Trading Volume

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ABSTRACT: The main purpose in this research is investigating the relationship between return, risk and stock trading volume. Statistical population is included 59 listed companies in Tehran Stock Exchange during 2003 to 2011. Vector Auto regression Estimates and Granger causality test have been used for testing research hypotheses. Also 3 hypotheses have been proposed. The findings show that in the first hypothesis between systematic risk and return with two interrupts significant relationship exists but in the second hypothesis there is no meaningful relationship between trading volume (trading size) and return with two interrupts but trading volume (trading turnover) and return with two interrupts inverse and significant relationship exists. Finally in the third can conclude between trading volume (trading size) and return is unidirectional relationship and between trading volume (trading turnover) and return is reciprocal relationship.

Keywords: Stock Return, Systematic Risk, Trading Volume, Causality Test

ORIGINAL ARTICLE

INTRODUCTION

Investment development is caused on the one side to attracting non-efficient investments and guidance to productive economic sectors and on other side according to investors orientation (based on the risk and return) investments will be directed towards industries that benefits are greater than the risk and finally, will be cause the optimal allocation of resources (Navidi Abaspour2005). For more understanding of market and investment we can point to Capital Asset Pricing Model (CAPM) which is comprehensive theory of relationship between risk and return in perfect market condition. Investors' logical behavior, fierce competition in investment with respect to investors' cognition towards risk and expected return, absence of taxes, bankruptcy and commissions cost are as hypotheses for CAPM (Shabahang, 1994). Investigation of relationship between trading volume and stock return since 1959 until now has been considered and the most important issue in this topic how is the relationship between trading volume and stock returns in the stock exchange.

Researchers are presented various hypotheses which are the primary reasons for the positive relationship between trading volume and stock return (Kalev, 2002) as follows:

Sequential Information Arrival Hypothesis (SIAH)
2. Mixture of Distribution Hypothesis (MDH)
3. Rational Expectation Asset Pricing (REAP)
4. Difference of opinion (DO). The main aim of this survey is answer to this applied question: "Can understand and identification of relationship between systematic risk and stock return or relationship between trading

volume and stock return impact on stock return prediction or not?

Alverdi et al. (2011) simultaneous communication and dynamic of trading volume and stock return have been studied in Tehran Stock Exchange during 2000-2011. They found that in simultaneous communication between trading volume and return stock a significant and positive correlation exists. Rahman et al. (2003) investigated relationship between trading volume and systematic risk and variables' relationship with stock return. The results show that between stock trading volume and return meaningfully relationship exists. Lee et al. (2001) evaluated causal relationship between stock return and trading volume with use of daily data from nine major world markets such as stock markets in New York, Tokyo, London, Paris, Toronto, Milan, Zurich, Amsterdam and Hong Kong and Granger causality there was none of the countries.

MATERIALS AND METHODS

For this research we chose 59 companies based on 5 criteria as follows:

1. These are only manufacturing companies.
2. Fiscal year has not change.
3. The companies have been accepted in Stock Exchange before 2003.
4. Company's data is available.
5. During the reviewed course trading halt should not exceed 3 months.

In this research independent and dependent variables are same because Vector Auto-regression is used.

Return: Set of benefits during a financial period shall be entitled to a share (Ghasemi, 2005) and evaluates as follows:

$$R = \frac{\text{Percent of priority right} - (1000 \times \text{DPS} + P_{t-1}) - P_t \times \text{Percent of bonus shares} + \text{percent of priority right} [(1 + P_{t-1})]}{P_{t-1}}$$

Systematic risk:

Systematic risk is degree of return changes of especially assets or investment toward return changes of market investments portfolio and measures with β (NikoparvarYazdi, 2007).

Trading volume:

Trading volume is the monetary value of transactions of purchase and sale of shares at a time (exm. working day) (Nikoparvar Yazdi, 2007) and measures as a follows:

1. Log (trade) = Logarithm of trading turnover
2. Log (Trade-size) = Logarithm of trading volume.

Research hypotheses:

The first hypothesis:

Between systematic risk and return significant relationship exists.

The second hypothesis:

Between trading volume and return meaningfully relationship exists.

The third hypothesis:

Between trading volume and return establish causal relationship.

Statistical methods

For testing the first hypothesis Vector Auto-Regression model has been used.

$$R_{i,t} = a_0 + a_1 \sum_{j=1}^N R_{i,t-j} + a_2 \sum_{j=1}^N B_{i,t-j} + \varepsilon_{i,t}$$

Where: $R_{i,t}$: Asset (stock) return of i company in t year, $B_{i,t}$: Systematic risk of i company in t year,

To test the second hypothesis has been used Vector Auto- Regression model as follows:

$$volume_{i,t} = a_0 + a_1 \sum_{j=1}^N R_{i,t-j} + a_3 \sum_{j=1}^N volume_{i,t-j} + \varepsilon_{i,t}$$

Where:

Volume_{it}= Trading volume of i company in t year R_{it} = Asset (stock) return of i company in t year

Finally for testing the third hypothesis first for Understanding that causality relationship between trading volume and stock return has been established or not Vector Auto- Regression model has been applied and after that to test the hypothesis Granger causality test is used.

RESULTS

The table 1, shows the results obtained from processing the first model to test the first hypothesis. The findings suggest between systematic risk and return significant relationship with two interruptions exists (amount of t test is more than 2) and relationship is direct means whatever systematic risk is greater, return also is higher and conversely. Thus, the first hypothesis is confirmed.

With respect to table 2, between trading volume (trading size) and return doesn't exist significant relationship (amount of t test is lower than 2). Thus, the second hypothesis didn't approve.

According to table 3, between trading volume (trading turnover) and return with two interruptions significant and inverse relationship exists. Thus, the second hypothesis is confirmed.

Table 4, indicates that trading volume (trading size) is not return's Granger causality and this hypothesis is not rejected but Return is not Granger causality of trading volume is rejected (security level is lower than 5%) means return is Granger causality of trading volume therefore between return and trading volume causality relationship exists and the third hypothesis is approved.

According to the table 5, trading volume (trading turnover) isn't return's Granger causality and this null hypothesis is not confirmed because security level is lower than 5% means trading volume is return's Granger causality and also return isn't Granger causality of trading volume (trading turnover) is rejected (security level is lower than 5%) means return is Granger causality of trading volume and return is causing a trading volume and trading volume can also lead to return. Thus, between return and trading volume causality relationship exists and the third hypothesis is confirmed the variables.

Table1. First model of the study

Description	Systematic risk		Return	
	coefficient	t	coefficient	t
Width of Origin	0.148446	0.65018	26.64453	2.08980
Systematic risk with 1 interruption	0.170614	3.53704	-0.917731	-0.34070
Systematic risk with two interruptions	-0.096233	-2.52224	5.539241	2.08444
Return with one interruption	-0.001269	-1.59953	-0.081787	-1.84642
Return with one interruption	0.001704	2.27320	-0.074945	1.79069
coefficient of determination	0.064189		0.04258	

Table 2. Second model processing to test the second hypothesis

Description	Return		Trading volume	
	coefficient	t	coefficient	t
Width of Origin	26.64453	2.08980	0.390069	4.41625
Return with one interruption	-0.081787	-1.84642	0.000527	-1.81677
Return with two interruptions	-0.074945	-1.79069	-0.000527	-1.81677
Trading volume(size of trading with one interruption)	19.66604	2.64808	0.656072	12.7521
Trading volume(size of trading with two interruption)	-15.41158	-1.4286	0.230684	4.41393
Coefficient of determination	0.042958		0.709291	

Table 3. Second model processing to test the second hypothesis

Description	return		Trading volume	
	coefficient	t	coefficient	t
Width of Origin	4.596581	0.19669	1.442698	5.21201
Return with one interruption	-0.065107	-1.49425	0.000896	1.73707
Return with two interruptions	-0.078541	-1.87322	-0.000660	-2.32903
Trading volume (Trading turn over with an interrupt	7.066814	1.75120	0.417464	8.73402
Trading volume (trading turnover with two interrupt)	-1.876742	-2.46199	0.376530	7.82553
Coefficient of determination	0.034854		0.490891	

Table 4. Test of the third hypothesis

Explanation	F test	Security Level
Trading volume (trading size) is not return`s Granger causality	0.05798	0.9437
Return is not Granger causality of trading volume(trading size)	3.16033	0.0435

Table 5. Test of the third hypothesis

Explanation	F test	Security level
Trading volume(trading turnover) is not return`s Granger causality	2.97757	0.0520
Return is not granger causality of trading volume(trading turnover)	2.92877	0.0546

DISCUSSION

According to the findings the first hypothesis approved because between systematic risk and stock return a meaningfully and direct relationship exists means whatever stock`s systematic risk is greater, its return also is higher and since has two interruptions relationship with return so can conclude in past few years companies had high level of return also had high level of systematic risk that this issue is according with financial concepts and theories means more risk has more return. With respect to the results of the second hypothesis between stock trading volume and return inverse and significant relationship exists so this hypothesis is approved and according to the results, between trading volume (trading size) and return there is a unidirectional relationship and return determines trading volume but there is reciprocal relationship between trading volume (trading turnover) and return means with increasing of trading volume (trading turnover) return will increase and vice versa.

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