Macrothink Institute™

Asian Journal of Finance & Accounting
ISSN 1946-052X
2014, Vol. 6, No. 2

Evaluation of Return Mean and Stock Surplus Return Mean with Two Approaches of Traditional Risk and Downside Risk

Dr. Ebrahim Abbasi

Associate professor, Alzahra University, Iran

Faculty of Economic and Social Sciences, Alzahra University, Tehran, Iran

E-mail: abbasiebrahim2000@yahoo.com

Hanieh Sadat Hoseini

Department of Accounting, Islamic Azad University kalaleh, Iran

E-mail: hosseini.k.s@gmail.com

Amir Mohammadzadeh (Corresponding author)

Department of Insurance & Financial Management, University of Tehran, Iran

E-mail: amir.mohammad@alumni.ut.ac.ir.

Received: July 22, 2013 Accepted: Nov. 23, 2014 Published: December 1, 2014

doi:10.5296/ajfa.v6i2.6010 URL: http://dx.doi.org/10.5296/ajfa.v6i2.6010

Abstract

This study aims to compare performance of indexes of traditional risk (variance and traditional beta) and indexes of downside risk (semi-variance and downsize beta) to evaluate risk and better evaluation of return and stock surplus return in Tehran stock exchange market. The statistical sample contains 60 firms from 2005 to 2009 with panel data pattern. To test the comparison between the two indexes of traditional and downside risk, linear regression has been used. The results show that downside risk evaluates stock return mean better than traditional risk does. In addition, downside risk evaluates stock surplus return better than traditional risk.

Keywords: D-CAPM, Downside risk, Downside beta, Semi-variance, Traditional beta

1. Introduction

Investment, as an economical decision, has always had two components of risk and return, and interchanging of these two brings about investment various blends. Investors seek to maximize their own income from investment, and on the other hand, they encounter uncertainty on financial markets, the latter makes access to investment earnings uncertain. In other words, all investment decisions happen based on relationships of risk and return. Risk and return have direct relationship with each other.

Dictionary defines investment risk as potential loss of investment which can be calculated. Financial and arithmetic amount of risk equals probability distribution of each investment. Weston and Bigam believe that risk of an asset is the result of probable changes of future return of that asset.

As assets return distribution is not normal and there is skewdness in returns distribution, variance cannot be used. Therefore, in postmodern theory of portfolio, return semi-variance has been used as risk index for the following reasons: first, investors do not hate appropriate (positive) changes of return, but they only hate downside (negative) changes. Second, in both situations of symmetric and asymmetric return distribution, semi-variance can indicate the concept of risk as much as variance does. This study is different from previous studies at time period, using panel data, testing second hypothesis model, and also the fact that stock return is monthly. The structure of this study includes theoretical considerations, and research literature, research hypotheses, research method, statistical analysis, and hypothesis testing, conclusion and suggestions for further studies.

2. Theoretical considerations and research literature

There are two viewpoints for definition of risk:

First viewpoint: risk as any possible fluctuations in future returns, and second viewpoint: risk as any possible negative future fluctuations (Raí, R., Saídi, A, 2004). According to these two viewpoints, modern and postmodern theories of portfolio have been shaped. Modern theory of portfolio deals with evaluating risk from first viewpoint, based on which the company risk is divided into systematic (unavoidable or market risk) and non-systematic (avoidable or exclusive risk) risk. From this viewpoint, evaluation index of systematic risk is (β) and evaluation criterion of risk is variance. Based on postmodern theory which views risk as potential loss (possibility of negative fluctuations), appropriate changes (increasing financial assets return rate) is not considered as risk, and the observations which are lower than return mean rate are considered as risk.

Capital assets pricing model (CAPM) has been modeled based on the fact that investors invest with variance-mean chart. This behavior chart in CAPM reflects a balance in which investors maximize an appropriate function which depends on two parameters of return and variance U=f(μ,ϭ2). This model based on different hypotheses, tries to explain investors ‘behaviors in assets pricing. Its main idea is that an asset price should be in a way that expected return makes up for investors ‘risk.

CAPM has developed by Markwitz. One of the underlying concepts of CAPM is that market situations are symmetric, and there is an interface between risk and return in a way that whenever a high risk is accepted by investor, a high return is expected. The idea that market is symmetric is not true in the model of D-CAPM2 which is an advanced version of CAPM, it means that accepting more risk which is expected to bring about more return, does not necessarily bring about more return. Conditions of market symmetry are derived from the factors that not only affect risk, but influence assets expected return rate. Hence, there is no interface between risk and return. The most important cause of producing D-CAPM is that negative risk viewpoint, and semi-variance index is not considered as downside risk. Because in conditions of asymmetric market, investors run away just from falling and negative change. In addition, semi-variance is obtained from blending information which has been derived from variance and skewdness (asymmetry). In these conditions, when CAPM is mediated, the factors which have been applied in such as systematic risk (β) should also be mediated, and downside beta should be replaced with that.

Semi-variance and semi-standard deviation have been presented as downside risk with two papers by Markwitz and Ry. A criterion which deals with only deviations lower than mean. Markwitz offered two different bases for obtaining semi-variance:

1. Below-mean Semi-variance rate which is total of deviation from return mean rate.

2. Target-mean Semi-variance rate which is total of deviation from goal return rate.

(Qurik,J.P. R.Saposnik, 1962). Theoretically analyzed that semi-variance is better than variance. (Mao,James C.T,1970). Proved that for investors, only downside is of high importance, and prefer semi-variance, and provided a strong, fundamental, practical theory to search on semi-variance under goal rate. (Hogan,W.,&Warren,J,1974), extracted a portfolio optimization arithmetic algorithm for expected return and semi-variance under goal rate (ES index), and developing their own model, they offered ES-CAPM which is a asset (β) sensitivity index to market fluctuations. This new index is called downside beta. (Harlow,V.&Rao,R, 1989). Developed a form of pricing model based on downside risk chart, and all previous models are a form of this model. Through an experimental research, they concluded that assets return mean is an appropriate index of goal rate.

(Bawa,V.&Lindenberg,E, 1977). Offered LPM-CAPM which prices semi-variance in mediated conditions. (Estrada,J, 2002). and (Estrada,J, 2004). And (Harvey,C.R, 2002). tested downside risk indexes in mediated and non-mediated conditions. They suggested that downside risk indexes determine the conditions of developing markets better. Strada developed the model of D-CAPM which can present a good estimate of expected return in asymmetric market. (Ang ,A.Chen,J.Xing,Y, 2002). used three types of beta, Strada beta, Hugan beta, and Bava beta. In these betas, skewdness has been included differently and they studied whether downside beta or downside skewdness are useful for explaining temporary return or not. They measured downside beta with conditional falling correlations and with market changes and concluded that all three models of CAPM based on downside risk, show a positive risk, but only Strada was significant.

(Hawang,S.Pedersen,C, 2004). Showed that downside beta presents a more suitable estimate for expected return rate in asymmetric market than CAPM beta.

(Estrada,J, 2007). Showed downside risk indexes, based on experimental data, are more reliable than traditional indexes of risk. He used return data in his study. In these studies, downside beta explains 45% of temporary return changes of the sample (including both new-born market and developed market).however, 55% of temporary return changes of the sample dealing with new-born market can be explained by downside beta.

(Don U. A. Galagedera, 2007). showed that the relationship between traditional and downside beta is effected by parameters such as standard deviation, skewdness, and the effect of mentioned parameters on extracted relationships in an downside chart is significant in terms of importance. The results showed that if asset return distribution is not normal, Beva and Ledinberg beta is a better index of systematic risk compared to other risk indexes. In addition, in markets which return distribution has more skewdness, downside beta is a suitable index of systematic risk. The results of the study showed that in new-born markets there is no standard model having higher acceptability power, and it should be warned to the people who work in new-born markets.

(Qaiser, A.A,Usman.M,Shahid.S,K,Saeed, 2011). analyzed the stages of providing CAPM and concluded that D-CAPM which is based on downside risk, is a fast alternative for CAPM which has all features of CAPM. Based on the ample evidence from all markets particularly new-born markets, it seems D-CAPM can improve problems of assets pricing.

Having analyzed variance and semi-variance at the level of assets return for indexes of 44 countries, (Steven L.Beach,2011). concluded that ratio of obtained risk for return in D-CAPM (56%) is more than CAPM (42%). It is a strong reason for the fact that semi-variance and downside beta better shows countries' surplus return.

(Raí R., Khosravi, A, 2007). studied capital assets pricing model (CAPM) performance by replacing three types of downside risk (Bava-Lindenberg beta, Harlo-Rao beta, Strada beta) with traditional beta index. They concluded that using Bava-Lindenberg beta and Harlo-Rao beta as systematic index in capital asset pricing model does not make any significant difference in estimating expected return, and has the same performance as traditional beta does. But Strada beta instead of traditional beta in estimating expected return works significantly better in explanation power.

(Saídi, A., Safdaripour, A, 2008). compares normal indexes of risk (beta, Sharp ratio, and Trino index), and downside risk indexes (Beta, Sharp ratio, and mediated Trino index). They concluded that mediated beta indexes, and mediated Trino index determines stock surplus return significantly better than equivalent normal indexes.

3. Research hypotheses

1. Downside risk evaluates stock return mean better than traditional risk does.

2. Downside risk evaluates stock surplus return mean better than traditional risk does.

4. Research methodology

Statistical population of the research contains all non-financial companies accepted in Tehran stock exchange market from 2005 to 2009. Required data was extracted by corpus and monthly return by Tadbirpardaz software. The number of studied sample in this study is 60 companies which have been selected through criteria filtering technique and with regard to the following criteria:

Omission of the companies which their stocks have been supplied for the first time during the studied period. Omission of the companies with transaction breaks over 2 months among the companies passing through the first filter. The type of studied company is non-financial and therefore financial institutes and banks have not inserted in the sample. To purify data, first, by using collected data, variables have been calculated for each of the studied companies and years. All purification operation has been done by the EXCEL software, and by EVIEWS software, hypotheses have been tested. In this research, blended data made statistical power of coefficients increase, and linearity among variables decrease, and estimations are done by increasing degree of freedom.

Research variables include variance, semi variance, traditional beta, and downside beta as independent variables, and return mean and stock return mean as dependent variables.

Variance: is an index of risk which return distribution statistically determines a share around its expected amount which is obtained as follows:

$$\sigma^2 = \frac{\sum_{i=1}^{n}(R_i - \mu_i)^2}{n} \quad (1)$$

R_i : monthly return of company stock

μ_i: monthly return mean of company stock

Semi variance: is an index of risk which considers only downside deviations (lower mean) of return. To obtain semi variance, Strada index is used as follows:

$$\sum_i^2 = E\left\{\min[(R_i - \mu_i),0]^2\right\} \quad (2)$$

Traditional beta: is an index of return changeability of an asset or an investment compared to market which measures an asset risk in terms of its effects on a group of assets. If the relationship between stock return rate and market return is proved, β can be obtained through the following relationship:

$$\beta_{im} = \frac{\sigma_{im}}{\sigma_m^2} = \frac{E[(R_i - \mu_i)(R_m - \mu_m)]}{E(R_i - \mu_i)^2} \quad (3)$$

R_i:monthly return of company stock

μ_i: monthly return mean of company stock

Downside beta: it measures company return compared to market return only in periods when market return is lower than mean or riskless return amount or investment minimum acceptable return. To obtain this index, Strada index [10] is used as follows:

$$\beta_i^D = \frac{\sum_{im}}{\sum_m^2} = \frac{E\{\min[(R_i - \mu_i),0].\min[(R_m - \mu_m),0]\}}{E\{\min[(R_m - \mu_m),0]^2\}} \quad (4)$$

Stock return: return is earning which a share brings about for its owner in certain time period. To obtain it, the following relationship is used:

$$R_{it} = \frac{P_1 + D - P_0}{P_0} \quad (5)$$

R_i : is the return of the company i, D: dividend, extra stock, and priority of stock purchase, P_1: stock price at the end of period, P_0: price at the beginning of the period

Surplus return: the models, based on the theory of efficient market including CAPM, believe that no stock has mediated return based on more risk as market return does. Surplus return means getting return more than market after doing mediations relevant to risk of investment risk function.

$$R_i^{ex} = (R_M - R_f)\beta_i \quad (6)$$

R_i^{ex}: surplus returns of company stock i, R_i: riskless return

5. Research hypotheses results

To analyze data, first descriptive data is presented in table 1.

Table1. Descriptive data of research

number of observations	minimum	maxim	median	mean	
60	-0/036	0/197	0/009	0/022	**return mean**
60	-0/614	2/132	0/083	0/123	**surplus return mean**
60	-2/170	0/697	-0/082	-0/126	**traditional beta**
60	0/017	0/656	0/111	0/151	**downsize beta**
60	0/000	2/509	0/029	0/223	**variance**
60	0/002	0/090	0/011	0/018	**semivariance**

To test normality of data, first Jark-Bera test has been used. Since dependent variables were not normally distributed (prob≤0.05), to have normality of dependent variables in Regression procedure, Johnson convert has been used in Minitab (figures 2,1), which causes probability of stock return mean variable to reach to 0.674, and probability of stock surplus return mean variable to increase to 0.574.

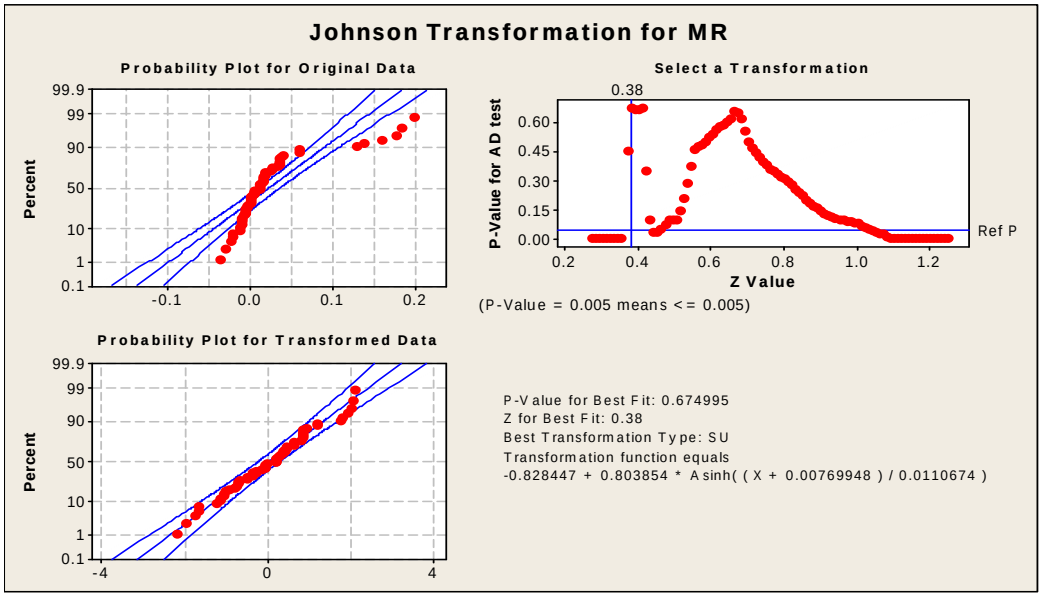

Figure 1. Examining normality of return mean

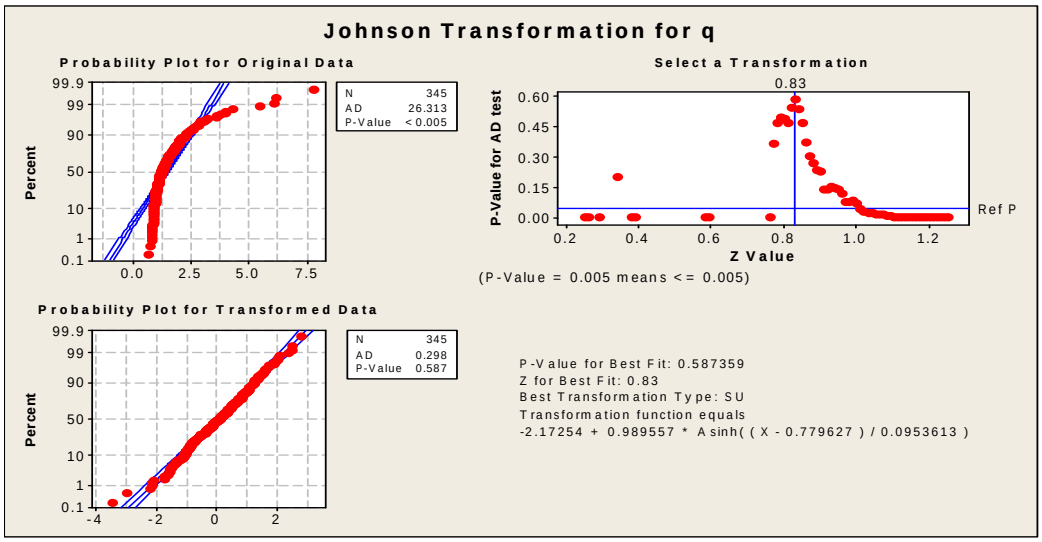

Figure 2. Examining normality of surplus return mean

After normalizing variables, for research variables to be independent from each other, correlation matrix has been used. The results of these matrixes showed that correlation coefficients among each couple of variables are lower than 0.50 which correlation between variables does not lead to sever linearity. In addition, because all estimated coefficients are significant and separable, it shows the fact that movement among variables is not sever.

Then validity of dependent and independent variables has been studied. Validity of the research variables means and variances of variables during the time and covariance of

variables in the studied years should be fixed. As a conclusion, using these variables in this model does not make false regression. To examine validity, Lovin, Lin, and Cho (2002), Bertiong, Im, Pesran and Shin (2003) and expended Dickey Fouller and unified root of Fisher-Filips (1999) have been used. According to this test, because probability amount is lower than 0.05, all variables of the study benefit from validity.

To test blending data, F-Test has been used, and to select proper model, Hasman test and fixed effects have been used. To test heteregenouity of variance, Lagranzh coefficient test, and to test whether in a regression model error sentences are correlated or not, Dourbin-Watson, and to test normality of error sentences, Jark-Bera test have been used.

First hypothesis results

First hypothesis: Downside risk evaluates stock return mean better than traditional risk does.

The results of data blending power test, Hasman test and fixed effects: the first stage in estimating panel data is awareness of proper procedure of estimation. To do so, F-Test has been used. In this test, with regard to the fact that F statistic is smaller, H_0 is accepted. As a conclusion, panel procedure can be used. To estimate equations with regard to sample features, first it should be determined that which of the procedures of fixed and random effects is appropriate. To do so, Hasman is used. In this test, rejecting H_0 is based on implementing fixed effects procedure. Then to prove Hasman, fixed effects procedure has been used.

Table 2. F-Test, Hasman and fixed effects

variable	Test -F obtained) (statistic	tableF	Hasman test (Prob)	fixed effects test (Prob)
σ	2.132	2.895	0.008	**0.000**
β	1.879	2.895	0.004	**0.000**
$\sum^2$	1.865	2.895	0.001	**0.000**
β^D	1.867	2.895	0.002	**0.000**
$\sigma / \sum^2$	2.755	3.122	0.002	**0.000**
β / β^D	2.357	3.122	0.004	**0.000**
$\sigma / \sum^2 / \beta / \beta^D$	2.756	3.343	0.001	**0.000**

Statistic F in all tables of this research shows that all processed Regression models are at the level of 95%. In table 3, regarding highness of R^2semivariance (73%), and downsize beta (72%) compared to traditional beta and variance indicates downsize risk high explanation power compared to traditional risk in evaluating stock return mean. That semi variance coefficient (38.36) and downsize beta (4.83) is high compared to traditional beta and variance indicates there is a significant relationship between downsize risk and stock return mean, and it is more affected by downsize risk.

Table 3. results of test between stock return mean and risk variables

$$MR_i = \alpha_0 + \alpha_1 RV_i + \varepsilon_i$$

RV_i	σ	β	$\sum^2$	β^D
α_0	-0.27(0.000*)	0.04(0.000*)	-0.66(0.000*)	**-0.69(0.000*)**
α_1	1.37(0.003*)	0.7(0.000*)	38.36(0.002*)	**4.83(0.008*)**
R^2	0.63	0.57	0.73	**0.72**
Adj.R^2	0.61	0.55	0.72	**0.71**
F_ statistic	254.9	117.16	281.53	**258.54**
Prob(F-S)	0.000	0.000	0.000	**0.000**
LM(statistic)	2.88	2.63	2.85	**2.73**
Durbin-watson	1.89	2.18	2.09	**2.08**
Jarque-bera	1.09	3.75	2.51	**1.07**
Prob(J-B)	0.57	0.153	0.28	**0.58**

MR: return mean, D.W: Dourbin-Watson Test that statistic should be between 1.5 to 2.5, LM: value of statistic of Lagranzh coefficient which its value should be lower than K of two tables (3.24), Jarque-Bera: the test of normality of error sentences whose probability of statistic should be more than 0.05. The numbers of statistic t are in regression table.

In table 4, as the research variables that is variance and semi variance, traditional beta, and downsize beta, have been inserted two by two, it can be observed that regarding the fact that semi variance coefficient is high (28.8) compared to variance coefficient (0.38), and that downsize beta coefficient (4.68) is high compared to traditional beta coefficient (0.27), when downsize risk criteria are inserted, risk traditional criteria are not significant. That downsize

risk coefficients are positive and high (semi variance, downsize risk) indicates that downsize has more significant relationship with stock return mean.

Table 4. Two-variable results between stock and risk variables

$$MR_i = \alpha_0 + \alpha_1 RV_1 + \alpha_2 RV_2 + \varepsilon_i$$

	RV_1 / RV_2 $\sigma / \sum^2$	RV_1 / RV_2 β / β^D
α_0	**-0.58(0.000*)**	**0.7 (0.000*)**
α_1	**0.38 (0.000*)**	**0.27 (0.001*)**
α_2	**28.8(0.000*)**	**4.68(0.000*)**
R^2	**0.63**	**0.72**
Adj.R^2	**0.61**	**0.71**
F_ statistic	**281.05**	**259.35**
Prob(F-S)	**0.000**	**0.000**
LM(statistic)	**2.85**	**2.85**
Durbin-watson	**2.09**	**1.88**
Jarque-bera	**6.63**	**8.71**
Prob(J-B)	**0.11**	**0.18**

MR: return mean, D.W: Dourbin-Watson Test that statistic should be between 1.5 to 2.5, LM: value of statistic of Lagranzh coefficient which its value should be lower than K of two tables (3.62), Jarque-Bera: the test of normality of error sentences whose probability of statistic should be more than 0.05. The numbers of statistic t are in regression table.

In table 5, all presented variables are inserted in a common multiple regression. The estimated model has determining coefficient of 73% which means independent variables high explanation power. Here, only downsize risk criteria keep their significance. In this situation, regression remains significant. Regarding the fact that beta and variance variables are not significant, it can be concluded that these criteria are not appropriate to calculate risk.

Table 5. The results of four variable test between stock return mean and risk variables

$$MR_i = \alpha_0 + \alpha_1 RV_1 + \alpha_2 RV_2 + \varepsilon_i$$

	RV_1 / RV_2 $\sigma / \sum^2$	RV_1 / RV_2 β / β^D
α_0	-0.58(0.000*)	0.7 (0.000*)
α_1	0.38 (0.000*)	0.27 (0.001*)
α_2	28.8(0.000*)	4.68(0.000*)
R^2	0.63	0.72
Adj.R^2	0.61	0.71
F_ statistic	281.05	259.35
Prob(F-S)	0.000	0.000
LM(statistic)	2.85	2.85
Durbin-watson	2.09	1.88
Jarque-bera	6.63	8.71
Prob(J-B)	0.11	0.18

MR: return mean, D.W: Dourbin-Watson Test that statistic should be between 1.5 to 2.5, LM: value of statistic of Lagranzh coefficient which its value should be lower than K of two tables (3.86), Jarque-Bera: the test of normality of error sentences whose probability of statistic should be more than 0.05. The numbers of statistic t are in regression table.

The second hypothesis results

The second hypothesis: Downside risk evaluates stock surplus return mean better than traditional risk does.

Table 6. F-Test, Hasman and fixed effects

variable	Test -F estimated) (statistic F	Hasman Test (Prob)	fixed effect test
β/σ	**2.63**	**0.007**	**0.000**
$\beta/\sum^2$	**2.76**	**0.002**	**0.000**
β^D/σ	**2.12**	**0.001**	**0.000**
$\beta^D/\sum^2$	**2.56**	**0.001**	**0.000**
(3.62)value of table F			

Table 7. The results of surplus return mean and risk variables

$$MR_i^{ex} = \alpha_0 + \alpha_1\beta_{im} + \alpha_2 RV_i + \varepsilon_i$$

RV_i	σ	$\sum^2$
α_0	**0.26(0.000*)**	**-0.63 (0.000*)**
α_1	**0.16 (0.014*)**	**0.18 (0.000*)**
α_2	**1.41(0.007*)**	**35.44 (0.000*)**
R^2	**0.47**	**0.52**
Adj.R^2	**0.47**	**0.51**
F_ statistic	**252.10**	**1572.18**
Prob(F-S)	**0.000**	**0.000**
LM(statistic)	**2.52**	**2.63**
Durbin-watson	**1.88**	**2.24**
Jarque-bera	**2.32**	**1.05**
Prob(J-B)	**0.31**	**0.59**

MR: return mean, D.W: Dourbin-Watson Test that statistic should be between 1.5 to 2.5, LM: value of statistic of Lagranzh coefficient which its value should be lower than K of two tables (3.62), Jarque-Bera: the test of normality of error sentences whose probability of statistic should be more than 0.05. The numbers of statistic t are in regression table.

Table 8. The results of surplus return mean and risk variables

$$MR_i^{ex} = \lambda_0 + \lambda_m \beta_{im}^D + \lambda_1 RV_i + \varepsilon_i$$

RV_i	σ	$\sum^2$
α_0	-0.39(0.000*)	**0.71 (0.000*)**
α_1	1.38 (0.014*)	**1.73 (0.001*)**
α_2	1.008(0.007*)	**26.42 (0.003*)**
R^2	0.68	**0.63**
Adj.R^2	0.67	**0.63**
F_ statistic	1583.36	**285.17**
Prob(F-S)	0.000	**0.001**
LM(statistic)	2.76	**2.86**
Durbin-watson	1.89	**1.89**
Jarque-bera	4.51	**4.32**
Prob(J-B)	**0.10**	**0.11**

MR: return mean, D.W: Dourbin-Watson Test that statistic should be between 1.5 to 2.5, LM: value of statistic of Lagranzh coefficient which its value should be lower than K of two tables (3.62), Jarque-Bera: the test of normality of error sentences whose probability of statistic should be more than 0.05. The numbers of statistic t are in regression table.

The obtained results from model estimation are significant at the level of 95%. Regression results are showed at tables 7, 8. Semi variance and downsize beta coefficients in both models are variance and traditional beta coefficients. It means that downsize risk better shows stock surplus return changes. In addition, the results indicate that if any of the variables of downsize risk is inserted in the model, they will have higher determining coefficients. The highness of the obtained R^2 by traditional beta and semi variance (52%) compared to variance and traditional beta (47%), and downsize beta and variance (63%), downsize beta and semi variance (68%) has higher explanation power than variance and traditional beta (47%) for downsize risk to traditional risk in evaluating stock surplus return mean. Statistic F indicates the whole regression significance.

Discussion and conclusion

Using the models based on variance mean behavior for explaining Tehran stock exchange companies is not appropriate. Because in most parts of market, normality of return can not be used. Therefore, inappropriate risk indexes (semi variance and downsize beta) have been used in evaluating return mean, and surplus return mean, and it was proved that they are better

than risk traditional indexes. The direct and linear relationship between return and risk various indexes has been proved. The results show that downsize indexes have higher explanation power than traditional indexes for return and surplus return.

Therefore, analysts and activators of investment market can focus on downsize and falling risks to evaluate their predictions, and obtain more satisfactory results. The results of this research, in the first hypothesis, are in line with Quiric and Saposnik (1962), Estrada (2002, 2007), Harvey (2002), and Pederson and Howang (2002), and Don (2007). The results of the second hypothesis prove the researches done by StivenBech (2011), and Saídi and Safdaripour (2008).

Suggestions for further research

1. Using downsize risk criteria to evaluate appropriateness of investment projects

2. Evaluating performance of common funds investment basket through downsize risk approach

3. Evaluating downsize risk criteria in financial institutes and investment companies

4. Semi variance analysis under target rate at the level of companies return.

References

Ang, A., Chen, J., & Xing, Y. (2002). Downside correlation and expected stock returns,EFA 2002 Berlin Meetings Presented Paper: USC Finance & Business Econ.

Bawa, V., & Lindenberg, E. (1977). Capital market equilibrium in mean –lower partial moment farmwork. *Journal of Financial Economics, 5,* 189-200.

Don U. A. Galagedera. (2007). An alternative perspective on the relationship between downside beta and CAPM beta. *Emerging Market Review, 8,* 4-19

Estrada, J. (2002). Systematic risk in emerging market: The D-CAPM. *Emerging Markets Review, 4,* 365-379. http://dx.doi.org/10.1016/S1566-0141(02)00042-0

Estrada, J. (2004). Mean-semi variance behavior: an alternative behavioral model. *Journal of Emerging Market Finance, 3*, 231-248

Estrada, J. (2007). Mean –Semi variance behavior: Downside risk and capital asset pricing. *International Review of Economics and Finance, 16*, 169-185. http://dx.doi.org/10.1016/j.iref.2005.03.003

Harlow,V., & Rao, R. (1989). Asset pricing in a generalized mean-lower partial moment framework: Theory and evidence. *Journal of Financial and Quantitative Analysis, 24,* 285-311.

Harvey, C. R. (2002). Drivers of expected returns international market. *Emerging market Quarterly,* 32-48.

Hawang, S., & Pedersen, C. (2004). Asymmetric risk measures when modeling emerging markets equities: Evidence for regional timing effects. *Emerging Markets Review, 5,* 109-128.

Hogan,W., & Warren, J. (1974). Toward the development of equilibrium capital market model based on semi variance. *Journal of Financial and Quantitative Analysis, 9,* 1-11. http://dx.doi.org/10.2307/2329964

Mao, James C.T. (1970). Models of capital budgeting E-V vs. E-S. *Journal of Financial and Quantitative Analysis, 5*(5), 657-676.

Markowitz, H. (1952). Portfolio Selection. *Journal of Finance, 46*, 469-477.

Qaiser, A. A, Usman. M., Shahid. S, K., & Saeed. (2011) From regular- beta CAPM to downside-beta CAPM. *European Journal of social sciences, 21*(2), 189-203.

Qurik, J. P., & R. Saposnik. (1962). Admissibility and measurable utility functions. *Review of Economics Studies.* http://dx.doi.org/10.2307/2295819

Raí R., & Khosravi, A. (2007). Explaining CAPM with downsize risk approach in Tehran stock exchange. *Journal Human and Social Sciences, 26.*

Raí, R., & Saídi, A. (2004). The basics of financial engineering and risk management, Samt publication, Management Faculty of University of Tehran.

Roy,A.D.(1952). Safety first and the holding of assets. *Econometrics, 20*(3), 431-449.

Saídi, A., & Safdaripour, A. (2008). Comparative evaluation of downsize risk indexes performance, and normal risk criteria performance in predicting stock surplus return mean in Tehran stock exchange. *Quarterly of stock exchange, 4,* 7-33.

Steven L. Beach. (2011). Semi variance decomposition of country- level returns. *International Review of Economics and Finance,* 1720-34.

Weston, J. F., & Brigham E.F. (1970). *Essentials of Managerial Finance, 3.*