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The Relationship between Accounting Earnings Beta and Size of a Company with Systematic Risk in Different Industries: Evidence from the Tehran Stock Exchange

Darush Javid[1] , Asgar Seif[2] and Maryam Mirzaei*[3]

[1]Assistant Professor in department of Accounting, Malayer Branch, Islamic Azad University, Malayer, Iran
[2] Advisor Professor in department Statistics, Hamadan, Branch, Islamic Azad University, Hamedan, Iran
[3]Department of Accounting, Hamadan, Branch, Ialamic azad university, Hamedan, Iran

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ABSTRACT

Being aware of the degree of risk in companies, especially systematic risk which can play a significant role in decision making process is one of the most important issues in the capital market. Because it is believed that return on an investment is dependent on systematic risk and systematic risk reflects changes in a share returns in proportion to those in a total share market return. Thus, the main purpose of this study is to investigate informational contents of accounting earnings beta and size of the company in predicting systematic risk. To achieve this purpose 122 companies in 18 industries whose data for 6 years was available (2006-2011) were selected. In general and based on distinguishing industries, the hypotheses were tested by using Spearman and Pearson correlation coefficients, multiple-variable regression, between-testee one -way variance analysis, and Kruskal-Wallis test. The SPSS 20 software package was used to analyze data. Results indicated that without distinguishing industries, the significant relationship exists only between size of the companies and systematic risk, in addition, information content of size is more in predicting risk. Whereas, in distinguishing industries there is a significant relationship between systematic risk and accounting profit beta among three industries and there is a significant relationship between systematic risk and size in five industries. Besides, the information content of accounting profit beta and size of the company to predict systematic risks in distinguished industries was different.

KEY WORDS: Accounting earnings beta, size of the company, Systematic risk, Information content.

INTRODUCTION

One of the factors affecting investment growth in capital market is helping investors in decision making process and reducing risk. Investors' purpose of investing is to maximize their wealth and to achieve this purpose they try to invest in securities with higher return rate, although alongside this purpose, they attempt to reduce the risk. The concepts of Risk and return are always accompanied with investing and financing concepts and no one can consider them as unrelated concepts, because investment decision is made based on risk and return relations. Therefore, investors always need to get the latest information on risk and return. In investing process, return is a motive power that provides incentive and is considered as a reward for investors, and risk can be defined as a probable difference between actual and expected return. Various kinds of risk are identified in financial literature. Namazi & Khajavi (2004) believe that risk can be divided into two categories: the first category includes the kind of risks which are related to a firm's internal factors depending on certain conditions of that specific firm and not on the other firms' risks, therefore, it can be specific to a certain industry, hence, it is called unsystematic risk (avoidable risk).

The second category includes the kind of risks that aren't related to any particular firm, but rather to whole market. This kind of risk is posed by factors influencing total return and is called systematic risk (unavoidable).It is the certain part of the return fluctuations of an asset due to the simultaneous influence of various factors on the market price of the securities.

Experts in Capital market use numerous ways such as market model, capital asset pricing model (CAPM) and index model to calculate the risks involved. In these models, systematic risk is the main variable to predict each company's return, which is calculated by the market data. Therefore, an approach to estimate the risk is using the market information (price and stock return). But if access to stock market information for companies which have their stock in the stock exchange for the first time or companies operating over the counter market (OTC) is not possible, using accounting information will be an appropriate approach to predict systemic risk. Thus, the primary aim of this study is to examine the relationship between accounting information obtained from accounting profit beta based on two criteria: return and firm size along with systematic risk. And the other aim is to determine the capability of any of the information obtained from the income statement and balance sheet, in predicting the systemic risk of listed companies in Tehran Stock Exchange so that they can later be used as guidance for potential and actual investor's decisions to assess various securities in the capital market. To this end, first we review the domestic and foreign literature. Then, the results of the data analysis and the results obtained from the study will be presented.

***Corresponding Author:** Maryam Mirzaei, Department of Accounting, Hamadan, Branch, Islamic Azad University, Hamedan, Iran,
E- mail : mirzaeimirzaei12@yahoo.com

LITERATURE AND HISTORY

The most important information provided by the accounting information systems is the kind of information that reflects the company financial position, performance and cash flows from several operations. From The American Financial Accounting Standards Board's view, the main objective of the financial statements is to present detailed and classified information about the company's financial position, financial performance and financial flexibility which will be useful to a wide range of financial statements users in making economic decisions **(**Financial Accounting Standards Boards, 1978**).** Accounting information plays an essential role in making economic decisions**.** Managers, investors, creditors and other users use the financial statements prepared by the accounting system to discharge their responsibilities**.** However, without Professional analysis not only is this information useless but it can also be misleading**.** Financial analysts do various analyses using the information in these reports, and provide them to other users of this information. This information is vital, because the users use it for planning and making predictions.

On the other hand, the most important issue currently facing investors and users is to decide which pieces of information provided by the accounting system contain more information content and are more helpful in making decisions. These issues sparked a lot of arguments about the usefulness of the information reported in statements, and therefore, paved the way for conducting more studies on this case (Namazi and khajavi, 2004).

Hitherto, many studies have been done to evaluate the information content of accounting earnings through accounting figures by testing its relation with returns on securities. The famous study by Ball and Brown (1968) was the primary motivation behind the present study. They observed that unexpected changes in earnings are directly related to the remainder of stock return. On the other hand, many studies capital market-based accounting, show that accounting information is useful in determining securities risk, the domestic and foreign studies are as follows:

Beaver & Manegold (1975), examined the relationship between accounting beta and market beta by considering three variables (net income divided by equity, net income divided by total assets and net income divided by the market value of equity) to determine the degree of correlation between accounting betas and market betas of 204 companies listed in New york stock exchange. The results show that at the individual level of securities, 20 percent of the market beta is expressed by the changes in accounting beta, it can be concluded that the detection power of accounting beta in estimating systematic risk is low.

Ismail and Kim (1989), have addressed the relationship between accounting and systemic risk beta of 272 companies during (1967 to 1985). The time-series regression was used to calculate accounting beta and the market model was used to calculate systemic risk, moreover, the degree of correlation between accounting beta and market beta was determined by regression analysis and correlation coefficient. To calculate the accounting beta they used four variables : common shareholders' profits , common shareholders' profits plus depreciation cost , common shareholders' profits plus depreciation cost as well as deferred tax, and cash flows from operating activities .The results show that unlike individual level, there is a significant relationship between systematic risk and accounting beta at portfolio level, the highest correlation is between the cash flows beta and systemic risk ,while the correlation between accounting earnings beta and systemic risk is the lowest.

Karels & Sackley (1993**),** examined the relationship between accounting and market betas in 71 commercial banks in their study. They used two criteria (return on total assets and return on equity) to estimate the accounting beta. The results indicate that considering the market index used the correlation between accounting beta and market beta has fluctuated from 30% to 60%. Results are highly dependent on the duration of the study. The correlation is less during longer periods of time.

Andrew Brimble (2003), studied the role of accounting information to estimate the systematic risk of Australian companies. Accounting variables used in the study include: accounting beta, profits volatilities, growth, size, earnings-paying ratio, current ratio, financial leverage, interest coverage ratio and operating leverage which were obtained from the data of 123 firms during the period 2000-1991 .The results revealed that operating leverage and firm size are important factors for assessing systematic risk. Other accounting variables were important only in some industries which show that the relevance of accounting data in assessing systematic risk differs across different industries. In general, the results revealed that mentioned accounting variables explain more than 57% of the variations in systematic risk. He also found that the accounting models are more efficient than the other models for predicting risk.

Abdolghany (2005), studied the relationship between systematic risk and accounting risk criteria. These criteria include the leverage ratio, assets size, current ratio, earnings variability, earnings growth, dividends payable ratio and accounting beta. The results indicated that among these criteria assets size, current ratio, growth and dividend payable ratio have statistically significant relationship with systematic risk as compared to the other variables.

Kachecha & Strydom (2011**),** investigated the relationship between accounting variables and systematic risk. Variables used in their study are the variability of earnings, liquidity, cash flow standard deviation, stock dividend, operating leverage, financial leverage, accounting beta, asset growth and size. Data was obtained from 47 corporations listed in Johannesburg stock exchange that was available for 1990-2009 periods. The sample was divided into 3share-portflioes and 6share-portflioes by ranking firms based on historical beta to reduce the effect of measurement error on the estimated relationship between market beta and the accounting variables. Then regression analysis of companies on individual level and 3share-portflioes and 6share-portflioes was done .Results indicated that there is a significant

relationship between accounting data and systemic risk. It also showed that accounting variables are more helpful in estimating systematic risk.

Namazi and Khajavi (2004**),** examined the usefulness of accounting variables to predict the systematic risk in the listed companies in Tehran Stock Exchange during 1990-2001. To this end, 40 firms whose required information for 11 years was available were selected for the study. Next, the relationships between 17 accounting variables as the independent variables with systematic risk as the dependent variable were analyzed. Simple regression and multivariable regression techniques were used to test the hypotheses, and finally the sequential selection method was employed to select optimal model. In this study independent variables were divided into four main categories: financial, liquidity, activity, leverage and profitability ratios. The results revealed that the four major accounting variables are related to systematic risk indicator. On the other hand, regarding simple regression, only 12 independent variables are related to systematic risk.

Khani and Mullaei (2009**),**in their work used the operating profit and operating cash flows variables to forecast systematic risk of about 30 companies listed in Tehran Stock Exchange, during 1999- 2005. This study examined the relation between accounting operating earnings beta and operating cash flows beta. The return on profit (operating profit divided by the market value of the common stock) and the return on cash flows (operating cash flow divided by the market value of the common stock) were used to estimate accounting earnings beta and cash flows beta, respectively. The results suggested that both accounting earnings and operating cash flow information are related to systematic risk.

Kheder Alaghi (2013) in a paper investigated the determinants of systematic risk in listed companies in Tehran stock exchange, during 2001-2011. He uses five financial variables including liquidity, leverage, operating efficiency, profitability and firm size and examines their relation with systematic risk. He concluded that size does not have significant impact on risk. Whereas liquidity and operating efficiency are negatively related to systematic risk and leverage and profitability are positively related to systematic risk.

Hypotheses

Many capital market studies concluded that accounting information is useful for calculating the securities market risk. These studies, have demonstrated the high correlation between accounting data and systematic risk. The Present study seeks to examine such a relationship in the Tehran Stock Exchange. For this purpose, size and accounting earnings beta variables calculated by means of the balance sheet and income statement are selected to evaluate the correlation between balance sheet and profit (loss) statement. In this regard, the following hypotheses will be tested:

H1: Accounting earnings beta is directly related to systematic risk.

H2: There is an inverse relationship between systematic and risk Firm size.

H3: The information content of accounting earnings beta to estimate systemic risk of listed companies in Tehran Stock Exchange is more than size information content.

METHODOLOGY

This paper attempts to explore the role of information content of accounting earnings and size in forecasting systemic risk. Therefore, in nature this is a descriptive- correlation and in terms of goal ,this is an applied research.

Variables

Dependent variable: The dependent variable of study is Beta (systematic risk index) which was estimated for each company. Company monthly return and market monthly return data were used to estimate beta during period of 2006-2011. One of the most well-known ways to calculate beta, is CAPM (Capital Asset Pricing Model or Market Model) which is:

Formula 1 $$\bar{R}_i = \alpha_i + \beta_i \bar{R}_m + \bar{\varepsilon}_i$$

In this model, beta is the slope of the regression equation which is obtained by dividing the covariance of return on share (i) and return on market portfolio by dividing the variance of return on market portfolio, it can be represented as follows (Alaghi, 2013):

Formula 2 $$B_i : \frac{\mathrm{cov}\,(R_i \times R_M)}{\mathrm{var}\,(R_M)}$$

Krischenheiter & Jorgensen (2003) argue that, the beta estimated through the covariance of stock returns and market returns divided by the variance of market portfolio returns is consistent with the beta obtained by using the regression method (Sinaee and Khorram,2004).

In equation-2, R (i) is monthly returns on stock and R (M) is market return which calculated based on total stock price index and using the Laspyer index formula.

Independent Variables

Independent variables are; size, accounting earnings beta in terms of return on assets and earnings beta in terms of return on total assets. Annual financial statements during 2006-2011 are used to calculate independent variables.

-SIZE: A strong financial position can reduce the company's overall risk because larger firms usually enjoy a higher level of public safety. Financial analysts believe that's because they are better known (Shourvarzy and Pahlevan, 2010). In other

words, larger companies are more resilient and run lower commercial risks in financial straits due to greater access to product markets and economies of scale. Thus, larger firms are generally expected to run lower risks as compared to smaller companies.(Namazi &Khajavi,2004).

According to portfolio theory it can be stated that larger companies are more efficient than smaller companies due to increasing assets of the portfolio (the company). On the other hand, as long as larger firms are able to invest in assets with a lower average risk compared to average risks associated with smaller company's assets, they will run a lower risk (Beaver et al, 1970). Hence, the forecast that there is an inverse relationship between systematic risk and firm size is based on common sense (and not theory) (Wattss and Zimmerman, 1986).

To calculate the size variable such criteria as the logarithm of total assets or sales are used. Financial analysis may lead to unwanted and misleading results, if there is inflationary pressure when using financial ratios. (Dastgir,2002) .Therefore, and bearing in mind inflationary conditions, this study used the total assets as the basis for determining company value and its logarithm as the size variable.

- **Accounting earnings Beta:** If systematic risk is a market beta and is calculated on the basis of market information, then beta represents the risk obtained from accounting information particularly accounting earnings. Hence, it is expected that accounting earnings beta is directly related to systemic risk (Abdolghany,2005).

In this study two measures (Profit as a percentage of equity and profit as a percentage of total assets) are used to calculate beta. The formulas are as follows:

Formula 3 $$EB_{i(ROE)}:\frac{cov\ (ROE_i \times ROE_M)}{var\ (ROE_M\ )}$$

Formula 3-1 $$ROE_{i.t}=\frac{\text{Earnings After Taxes}}{\text{Equity}} \times 100$$

Formula 3-2 $$ROE_{M.t}=\left(\sum_{t=1}^{N} ROE_i\ \ /N\right)$$

Where : $EB_{i(ROE)}$ is earnings beta on equity of firm(i) ,ROE i is return on equity of firm(i) at the end of time (t), ROAM.t : market return on equity at the of time(i) and N is the number of sample.

Formula 4 $$EB_{i(ROA)}:\frac{cov\ (ROA_i \times ROA_M)}{var\ (ROA_M\ )}$$

Formula 4-1 $$ROA_{i.t}=\frac{\text{Earnings After Taxes}}{\text{Total Assets}} \times 100$$

Formula 4-2 $$ROA_{M.t}=\left(\sum_{t=1}^{N} ROA_i\ \ /N\right)$$

Where, , $EB_{i(ROE)}$ is the earnings beta on total assets of firm(i),ROE_i is the return on total assets of firm(i) at the end of time (t), $ROA_{M.t}$: market return on total assets at the of time(t) and N is the number of sample.

The remarkable point about calculating accounting earnings beta is that although none of the accounting risk variables is explicitly calculated by the covariance of market returns, this variable can show the uncertainty and risk associated with a company from various aspects.

Based on the above mentioned issue, the function of systematic risk is formulated as the following model:

Formula 5 $$SR = \alpha_0 - \alpha_1 size + \alpha_2 EB(ROE) + \alpha_3 EB(ROA) + \varepsilon$$

Where, size is firm size, EB (ROE) is accounting earning beta on equity and EB(ROA) is accounting earning beta on return on total assets.

Population

The population used in this study comprises all the listed companies in Tehran Stock Exchange .Based on the conducted analysis, the population consisted of 426 companies that were accepted in Tehran Stock Exchange from the beginning of April 2006. The selected companies are 426 in number and each of them belongs to a particular industry. The systematic removal method was used to select the samples of the study. First, we examined all the companies that were listed from the beginning of April 2006, then those that meet the following conditions were selected as sample.

1-Having a fiscal year ending on March 22(29 Esfand) which has not changed during 2006-2011.

2-Having no investment activities.

3- Their Symbol is not removed until the end of 2011.

4- Monthly data on returns on their stock and annual financial statements during 2006-2011 are available. The company's

5- Having no interruption more than six months in its stocks transaction during the study period.

On the basis of above conditions, 122 firms belonging to 18 industries were selected.

It should be noted that the sample includes banks active in stock, transportation, automobile industry, electrical equipments, cement and gypsum, chemicals, food products, metals, tiles, metal minerals, non-metal minerals, machinery, pharmaceuticals and metal products. Since after applying the systematic removal only a couple of companies were left operating in financial, petroleum, rubber and plastic industries, these companies had been classified as the other industries. Thus, the number of industries in the study is 14.

Findings

In this study, descriptive statistics were used to analyze the descriptive data for each industry. Then, using one-way analysis of variance (0ne-way ANOVA), the difference between the variables was measured in different industries. The Kolmogorov - Smirnov test was also used to determine the normality of variables.

If the significant level is greater than 0/05, the variables are normal. Considering that the variables are normal in some industries and in some others they are not normal, the Kruskal-Wallis test (The equivalent of nonparametric analysis of variance between testee) was used to determine significant differences in terms of average profit beta return on equity (ROE), return on total assets by profit-beta (ROA), firm size, and systematic risk in various industries.

Table (1): Kruskal Wallis Test

	Size	EB(ROE)	EB(ROA)	SR
Chi-Square	155.849	117.763	158.582	29.066
df	13	13	13	13
Sig	.000	.000	.000	.006

Based on the obtained significance levels, there is a significant difference in the average earnings beta (ROE), earnings beta (ROA), size and systematic risk in different industries (P-Value <0.05).

Considering the fact that this study explores the presence or absence of a relationship between variables, the correlation method was used to analyze the data. If the sample size is more than or equal to 30 the Pearson correlation test, If it is under 30, provided it is normal, the Pearson correlation coefficient and otherwise the Spearman correlation coefficient is used. (Behboudian, 1998, 147).Considering the normality of variables of the study, for industries whose sample size under 30 the Pearson was used to test hypotheses.

It is worth noting that, if the absolute value of the correlation coefficients is 001 to 0029, 003 to 0049 and 005 to 1, the relationship between independent variable and dependent variable would be weak, average and stronger, respectively.

Ultimately, the multiple regression technique with the simultaneous selection approach was used to decide on the optimal model that forecasts the systematic risk through the independent variables. Before fitting the model we ensured the significance of the linear model, normality, constant variance, independence of errors, and the lack of linearity phenomenon between the independent variables.

We will go on to test the hypothesis, first without and then with distinguishing industries later.

Test the hypotheses in general (without distinguishing industry)

Table (2): Correlations

N (732)	Correlation	Sig	Result
SR – EB (ROE)	.043	. 125	No Relation
SR – EB (ROA)	.037	. 157	No Relation
SR - Size	.114**	. 001	Weak and Direct Relation

H1: Accounting earnings beta is directly related to systematic risk.

According to the results displayed in the Table 2, this hypothesis is rejected in general. So, accounting earnings beta contains information content in forecasting the systematic risk.

H2: Firm size is in an inverse relationship with systematic risk.

According to the results displayed in the Table 2, there is a relation between systematic risk and size. However, since the correlation coefficient is positive, the relationship between these two variables is direct .So in general, the size contains useful information content for forecasting the systematic risk.

H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than size information content.

Considering the absolute value of the correlation coefficient obtained from the first and second hypothesis test, the information content of size in predicting systemic risk is greater than accounting profit. Thus, in general the third hypothesis is rejected.

After making that sure the linear model assumptions results are correct and regarding the results shown in the Table 3, the following model is presented:

$$SR = -0.867 + 0.220 * Size$$

Table (3): Summarized Multiple Regression to estimate model in general

Adjusted R Square	.011	F		3.691
Durbin-Watson	2.108	Sig		.012
Variables	B	T	Sig.	Result
(Constant)	-.867	-2.004	.045	significant
Size	.220	3.024	.003	significant
EB (ROE)	.024	.757	.449	No- significant
EB (ROA)	.031	.716	.474	No- significant

Test the hypothesis with distinguishing industry

1- The hypotheses test of the banks operating in Stock

Table (4): Correlations			
N (18)	**Correlation**	**Sig**	**Result**
SR – EB (ROE)	-.380	.060	No Relation
SR – EB (ROA)	.028	.457	No Relation
SR - Size	.634**	.002	Strong and Direct Relation

H1: Accounting earnings beta is directly related to systematic risk.

Based on the results shown in the Table 4, the first hypothesis is rejected. And the accounting earnings beta of the listed banks doesn't contain useful information content for predicting the systematic risk.

H2: Firm size is inversely related to systematic risk.

As shown in the above table, there is a positive relation between systematic risk and size. Hence, the size contains useful information content for forecasting the systematic risk in the listed banks.

H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than the size information content.

Since correlation coefficient obtained from the information content of size in predicting systematic risk is more than the accounting profit beta, the third hypothesis is rejected for the listed banks in the stock exchange.

After making sure of the fitness of linear model assumptions and considering the results shown in the table 3, the following model is presented:

$$SR = -10.196 + 1.404^{*} Size$$

Table (5): Summarized Multiple Regression to estimate the model				
Adjusted R Square	.408	F		4.910
Durbin-Watson	2.071	Sig		.016
Variables	B	t	Sig.	Result
(Constant)	-10.196	-2.622	.020	Significant
Size	1.404	3.177	.007	significant
EB (ROE)	-.922	-1.225	.241	No- significant
EB (ROA)	2.081	1.480	.161	No- significant

2- The hypotheses test in the transportation industry.

Table (6): Correlations			
N (18)	**Correlation**	**Sig**	**Result**
SR – EB (ROE)	.410*	.046	Direct and Moderate Relation
SR – EB (ROA)	.016	.475	No Relation
SR - Size	-.306	.109	No Relation

H1: Accounting earnings beta is directly related to systematic risk.

Considering the results shown in the Table 6, the first hypothesis is confirmed in transportation industry.

H2: Firm size is inversely related to systematic risk.

Considering the results shown in the Table 6, the second hypothesis is rejected.

H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than size information content.

Since correlation coefficient obtained from the information content of earning beta in forecasting systematic risk is greater than the same on size, the third hypothesis is confirmed for transportation industry.

Since the linear model fitness was not verified, the model could not be presented.

3- The hypotheses test in the automobile industry.

Table (7): Correlations			
N (120)	**Correlation**	**Sig**	**Result**
SR – EB (ROE)	-.039	. 338	No Relation
SR – EB (ROA)	. 037	. 345	No Relation
SR - Size	. 321**	. 000	Direct and Moderate Relation

H1: Accounting earnings beta is directly related to systematic risk.

Based on the results shown in the Table 7, the first hypothesis is rejected in automobile industry.

H2: Firm size is inversely related to systematic risk.

As shown in the above table, there is a positive relation between systematic risk and size

H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than the size information content.

Since correlation coefficient obtained from the information content of size in predicting systematic risk is more than the accounting beta, the third hypothesis is rejected for the automobile industry.

After making sure of the fitness of linear model assumptions and considering the results shown in the table 8, the following model is presented:

SR = -1.667 +.325* Size

Table (8): Summarized Multiple Regression Results to estimate the model

Adjusted R Square	.084	F		4.655
Durbin-Watson	1.508	Sig		.004
Variables	B	t	Sig.	Result
(Constant)	-1.667	-2.988	. 003	Significant
Size	. 325	3.683	. 000	Significant
EB (ROE)	-.028	-.574	. 567	No-Significant
EB (ROA)	. 050	-2.988	. 611	No-significant

4- The hypotheses test in the other industries

Table (9): Correlations

N (54)	Correlation	Sig	Result
SR – EB (ROE)	. 119	. 195	No-Relation
SR – EB (ROA)	. 120	. 194	No-Relation
SR - Size	. 083	. 276	No-Relation

According to the results shown in the Table 9 there is no significant relation between size and systematic. Hence, first and second hypotheses are rejected. Moreover, since independent variables are not correlated to systematic risk within other industries, it was not possible testing the third hypothesis. Since the linear model fitness was not verified, the model could not be presented.

5- The hypotheses test in the electronic equipments

Table (10): Correlations

N (24)	Correlation	Sig	Result
SR – EB (ROE)	. 046	. 416	No-Relation
SR – EB (ROA)	. 057	. 395	No-Relation
SR – Size	. 490**	. 008	Direct and Moderate Relation

H1: Accounting earnings beta is directly related to systematic risk.
Considering the results shown in the Table 10, the first hypothesis is rejected in electronic industry.
H2: Firm size is inversely related to systematic risk.
Considering the results shown in the Table 10, there is relation between systematic risk and size.
Since correlation coefficient obtained from the information content of size in forecasting systematic risk is greater than the same on accounting earnings, the third hypothesis is rejected for electronic industry.
Since the fitness of linear model was not verified, the model could not be presented.

6- The hypotheses test in cement and gypsum industry

Table (11): Correlations

N (84)	Correlation	Sig	Result
SR – EB (ROE)	-. 13	. 452	No-Relation
SR – EB (ROA)	. 035	. 378	No-Relation
SR - Size	-. 03	. 490	No-Relation

Based on the results shown in the Table 11 there is no significant relation between size and systematic. Hence, the first and second hypotheses are rejected. As independent variables are not correlated to systematic risk industry, the third hypothesis could not be tested .Also, the linear model fitness was not verified, and therefore, the model could not be presented.

7- The hypotheses test in chemical industry

Table (12): Correlations

N (42)	Correlation	Sig	Result
SR – EB (ROE)	-.118	. 229	No-Relation
SR – EB (ROA)	-.101	. 263	No-Relation
SR - Size	. 343*	. 013	Direct and Moderate Relation

H1: Accounting earnings beta is directly related to systematic risk.
Considering the results shown in the Table 12, the first hypothesis is rejected in chemical industry.

H2: Firm size is inversely related to systematic risk.

Considering the results shown in the Table 12, there is direct relation between systematic risk and size.

H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than size information content.

Since correlation coefficient obtained from the information content of size in forecasting systematic risk is greater than the same on earnings beta, the third hypothesis is rejected.

Since the linear model fitness was not verified, the model could not be presented.

8- The hypotheses test in food productions

Table (13): Correlations

N (48)	Correlation	Sig	Result
SR – EB (ROE)	-.057	. 351	No-Relation
SR – EB (ROA)	-.074	. 308	No-Relation
SR - Size	-.029	. 422	No-Relation

H1: Accounting earnings beta is directly related to systematic risk.

Considering the results shown in the Table 13, there is no significant relation between systematic risk and size ; hence ,the first and second hypotheses are rejected for food industry.

As independents variables are not correlated to systematic risk, the third hypothesis could not be tested.

Since the linear model fitness was not verified, the model could not be presented.

9- The hypotheses test in base metal industry

Table 14): Correlations

N (72)	Correlation	Sig	Result
SR – EB (ROE)	. 040	. 368	No-Relation
SR – EB (ROA)	. 170	. 077	No-Relation
SR - Size	. 235*	. 023	Direct and Weak Relation

H1: Accounting earnings beta is directly related to systematic risk.

Based on the results shown in the Table 14, the first hypothesis is rejected in base metal industry.

H2: Firm size is inversely related to systematic risk.

Considering the results shown in the Table 14, systematic risk is directly related to the size.

H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than size information content.

Since correlation coefficient obtained from the information content of size in predicting systematic risk is greater than the same on earnings beta, the third hypothesis is rejected for base metal industry.

Since the linear model fitness was not verified, the model could not be presented.

10- The hypotheses test in tile industry

Table (15): Correlations

N (36)	Correlation	Sig	Result
SR – EB (ROE)	-.127	. 230	No-Relation
SR – EB (ROA)	-.163	. 171	No-Relation
SR - Size	. 038	. 412	No-Relation

Considering the results shown in the Table 15, there is no significant relation between systematic risk and size; hence, the first and second hypotheses are rejected in tile industry.

As independents variables are not correlated to systematic risk, the third hypothesis could not be tested.

Since the linear model fitness was not verified, the model could not be presented.

11- The hypotheses test in metal mineral industry

Table (16): Correlations

N (36)	Correlation	Sig	Result
SR – EB (ROE)	.0 31	.429	No-Relation
SR – EB (ROA)	.0 22	.450	No-Relation
SR - Size	.221	.097	No-Relation

Based on the results shown in the Table 16, systematic risk is not related to the size; hence, the first and second hypotheses are rejected in metal mineral industry.

As independents variables are not correlated to systematic risk, the third hypothesis could not be tested.

Since the fitness of linear model was not verified, the model could not be presented.

12- The hypotheses test in non-metal mineral industry

Table (17): Correlations			
N (36)	**Correlation**	**Sig**	**Result**
SR – EB (ROE)	-.487**	. 001	Moderate and Inverse Relation
SR – EB (ROA)	. 179	. 149	No-Relation
SR - Size	. 009	. 480	No-Relation

H1: Accounting earnings beta is directly related to systematic risk.
Based on the results shown in the Table 17, accounting earnings beta is inversely related to systematic risk.
H2: Firm size is inversely related to systematic risk.
Based on the table 17, the second hypothesis is rejected.
H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than the size information content.
Since correlation coefficient obtained from the information content of accounting beta in predicting systematic risk is more than the size, the third hypothesis is confirmed.
After making sure of the fitness of linear model assumptions and considering the results shown in the table 18, the following model is presented:

SR =.736* Size -.112*EB (ROE)

Table (18): Summarized Multiple Regression Results to estimate the model				
Adjusted R Square	.277	F		5.481
Durbin-Watson	2.222	Sig		.004
Variables	B	t	Sig.	Result
(Constant)	-3.844	-1.934	. 062	No-Significant
Size	. 736	2.107	. 043	Significant
EB (ROE)	.112	-3.735	. 001	Significant
EB (ROA)	. 208	1.804	. 081	No-Significant

13- The hypotheses test in machinery industry

Table (19): Correlations			
N (48)	**Correlation**	**Sig**	**Result**
SR – EB (ROE)	. 518**	.000	Strong and Direct Relation
SR – EB (ROA)	-.193	.094	No -Relation
SR - Size	-.024	.436	No -Relation

H1: Accounting earnings beta is directly related to systematic risk.
Based on Table 19, the first hypothesis is accepted.
H2: Firm size is inversely related to systematic risk.
Considering the result shown in table 19 the second hypothesis is rejected in this industry.
H3: The information content of accounting earnings beta to estimate systematic risk of listed companies in Tehran Stock Exchange is more than the size information content.
Since correlation coefficient obtained from the information content of accounting profit beta in predicting systematic risk is more than the size, the third hypothesis is confirmed.
After making sure of the fitness of linear model assumptions and considering the results shown in the table 20, the following model is presented:

SR =.399*EB (ROE)

Table (20): Summarized Multiple Regression Results to estimate the model				
Adjusted R Square	.268	F		6.743
Durbin-Watson	1.681	Sig		.001
Variables	B	t	Sig.	Result
(Constant)	1.660	. 783	. 438	No-Significant
Size	-.260	-.677	. 502	No-Significant
EB (ROE)	. 399	4.219	. 000	Significant
EB (ROA)	-.257	-1.582	. 121	No-Significant

14- The hypotheses test in pharmaceuticals industry

Table (21): Correlations			
N (96)	**Correlation**	**Sig**	**Result**
SR – EB (ROE)	-.046	. 329	No -Relation
SR – EB (ROA)	-.025	. 406	No -Relation
SR - Size	-.110	. 144	No -Relation

Considering the results shown in the Table 21, systematic risk is not related to the size; hence, the first and second hypotheses are rejected in pharmaceuticals industry.
As independents variables are not correlated to systematic risk, the third hypothesis could not be tested.
Since the fitness of linear model was not verified, the model could not be presented.

Summary of data analysis results

In the overall analysis of the data, there is no statistically significant relationship between accounting beta and systematic risk in terms of return on equity .Thus, in terms of return on equity, accounting earnings beta is not contain informational content useful for forecasting the systematic risk. But the results obtained through distinguishing different industries show that there is a direct and moderate relation between accounting beta based on equity returns and systematic risk in the transportation industry, direct and strong in the machinery industry, and a strong and inverse relation in the non-metal minerals industry. Thus, it can be concluded that the type of industry is a decisive factor concerning the presence or absence of relation. Moreover, amount and direction of the relationship between beta and size may vary in different industries**.** As Brymbl (2003) suggests this relation differs in various industries.

In the analysis of the data both in general and by distinguishing different industries, the results revealed that there is no significant relation between accounting beta in terms of return on total assets and systematic risk. Thus, in this case accounting beta doesn't contain useful informational content for forecasting risk.

The results obtained from testing hypothesis-2, in general, show the direct and weak relationship between size and systematic risk, while in distinguishing industries, the relation is direct and strong in banks, direct and moderate in automobile, electronic and chemical and direct and weak in metal industries, respectively. Thus, the amount and of the relation in various industries and in general differs but the overall direction is direct. It may be due to government policies and political pressures mostly leveled at larger companies. On the other hand, based on the size assumption, if all other conditions remain constant, larger firms are more politically sensitive and bear more political costs compared to smaller firms (watts and zimberman, 2009). So, as the results show, the relationship between systematic risk and size may be direct. This finding is consistent with that of Astrydvm Kachcha (2011), Namazi & Khajavi (2004) and Brimbl (2003), however, the relationship is inverse in their work .This finding is also inconsistent with that of Kheder Alaghi (2013). . He concludes that size does not have significant impact on systematic risk. It may be due to a longer period of his study (ten years).

The third hypothesis is rejected in general because the accounting beta is not related to the systematic risk, and the correlation between beta and systematic risk is smaller than the correlation between size and systemic risk. When testing hypothesis-3 based on distinguishing industries, for the above- mentioned reasons, the hypothesis is confirmed in transportation, non-metal and machinery industries, while it is rejected in banks, automobile, electronic devices and base metal industries.

Conclusion and suggestions

Financial management and accounting are two important paths to calculate the risk of companies. The main aim of this study is to investigate the relation between a number of accounting variables to determine whether the information provided by the accounting system can help forecast the systematic risk associated with companies**.** The other aim is to identify the variable that contains more information content for forecasting the systematic risk. The results of Pearson correlation test showed that**,** in the analysis of the data without distinguishing industries, firm size has only a weak direct relation with systematic risk, while the other two variables have no significant relationship with systematic risk during 2006-2011. So, the information content of size to forecast systemic risk is more than that of accounting earnings**.** However, in the analysis of the data with distinguishing industries among the examined fourteen industries, there is a statistically significant relationship between accounting earnings beta and systematic in terms of return on equity only in the transportation, non-metal minerals and machinery industries. Hence, the information content of accounting earnings beta in terms of return on equity (ROE) in forecasting systematic risk is more than that of the size. Besides, firm size is significantly related to systematic risk in listed banks in Tehran Stock Exchange, automotive, electrical appliances, chemicals and basic metals .Therefore, the information content of size is more than accounting earnings to forecast systemic risk**.** Since the information content of accounting earnings and firm size vary within different industries, it cannot be conclusively determined that the information content of which financial statement (Income Statement and Balance Sheet) is more useful for forecasting systematic risk .

Ultimately, through multivariate regression and using accounting information a model was developed to forecast systemic risk. For this purpose, first, regression assumptions were examined, and then the model was developed if possible.

The following recommendations are suggested:

Stock Exchange officials require the companies to report timely accounting information to investors, so that they can use the information as an alternative to systematic risk for making economic decisions. Investors should learn about the analysis of financial statements and get expert advice before making any invest**.**

It is suggested that future researchers investigate the relationship between the other accounting variables and systematic risk**.** Moreover, the relation between the accounting variables and total risk, and on the hand, relation between the economic, social and political crises as well as systematic risk and the factors causing stability or reduction in systematic risk should be

examined .Since during the present study, systematic risk is influenced by economic, political and social factors, the future studies should replicate the research and the results will be compared with those of the present study.

Limitations

The present study was carried out during 2006-2011**.** Therefore, we must be cautious in generalizing the results to other periods of time**.** Moreover, due to the limited sample, generalizing the findings to other companies and industries should be done with caution.

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