**Comparative Investigation of the amount of Systematic Risk in the different industries in Tehran Stock Exchange (TSE) in Tehran Stock Market (2004-2010)**

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**Abstract:** In the financial literatures capital asset valuation model represent the relationship among systematic risk (Beta) with expected return an each share. One of the fundamental problem that portfolio managements and investors face with it in expected ratio measuring is the beta measurement accuracy for investors decision making in stock and exchange market so that they sure in achieve in expected return on their investment. Thus in this study systematic risk amount in various industries survey. Also statistical tests such as Tokey, Scheffe and has done for a sample that include industries monthly return between 2004-2010years. And finally the findings show meaningful deferent in amount of systematic risk in various industries.

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**Keywords:** Systematic Risk; Expected Return; Portfolio Management

**Introduction**

TSE as the main investment institution in Iran couldn’t play its role in production in Iran as many financial theorists believe. The investors in TSE try to achieve the highest return of their investment and consider also the investment risk and in case of accepting risk with the expected return, high investment is achieved. While the actual return of the investment with the expected return of the investors is different. Thus, stock buyers in stock market consider the risk and investment return both at the same time. Thus, the recognition of the risk and its characteristics is of great importance for the investors.

The present study is regarding one of the investment features in stock market and compared the systematic risk size in various industries listed in TSE.

Considering return and risk is one of the greatest issues being raised in investment. Because the investment return is a function of that risk and the higher the risk, the expected return is high. As the total risk of the company is including non-systematic risk is excluded, the identification of the systematic risk and its comparison in stock industries is of great importance for the investors, industries managers, financial institutions such as banks, government and other credit institutions.

The present study by effective investigation of the risk and the identification of their relation helps the beneficiaries of the company to detect the existing risk better and have a good relation for decision making. In CARM model, one was used for all the industries. The stability of beta is the main condition for implementation of pricing model of capital assets, if the beta is varied; the operational problems avoid the application of the mentioned model (Dastgir, 1986).

Beta size depends upon prediction period, the period in which beta is estimated and although there is no agreement about the period of optimized estimation, the monthly data for a five or six period are the best selection (Gronold and Fraser).

**Research hypothesis**

The size of systematic risk had significant difference in various industries listed in TSE.

**Research method**

The current study was applied in terms of aim and based on the method was causative-comparative with semi-experimental design and the comparison of static groups. For data collection and theoretical issues, library method was applied. The study data were collected by organizational documents in TSE. The stock price of the companies, total price of the stock and other information were provided by the existing data in the quarterly, monthly and annual journals of TSE and other organizational documents.

The study scope is dedicated to financial management evaluating the systematic risk size in various industries of the companies listed in TSE during 2004-2010. The place scope of the study was TSE and the study population was the industries listed in TSE.

The time scope of the study in terms of data collection was 2004-2010.

The study population was all the active industries in the stock market from the beginning of Farvardin 2004 to the end of Esfand 2010.

Based on the limitation of the existing industries in TSE, all the industries were selected as sample. In the present stud y, the systematic risk variable of the industries was investigated and the type of variable and their extraction method from the raw data were mentioned in the following.

For classification of the raw data and converting them to study variables and presenting the Measures of central tendency and dispersion, descriptive analysis was applied. The descriptive analyses were done based on mean, SD, variance, skewness, kurtosis, skewness and kurtosis coefficients. For data analysis of the test hypotheses, inference statistics was applied. To evaluate the conceptual model and hypothesis test, parametric tests of one-way variance analysis was used and to compare the mean of two independent population and non-parametric tests and the investigation of other findings in the study, the comparison of univariate mean and the comparison of the mean of some independent population was applied.

**Results and discussion**

The statistical data of beta variable of 20 industries was extracted by monthly data and the period of 2004-2010 as 84 observations. The study variable was obtained by the formula of beta calculation from the raw data. Thus, the present study has 1980 observations being measured in ratio scale. To describe the study variable in the population size, the mean, SD, variance, skewness, kurtosis were applied. The sum of the variables in the studied industries was investigated separately and 20 industries were divided.

1. The description of “sampled industries” beta: the beta of “sampled industries” with the mean 0.496 and SD and variance 1.336 and 1.786, respectively had positive skewness and kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.

**Table 1: The descriptive measures of the sum of the beta of the studied industries in the sample**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Significance level of KS test | Kurtosis deviation | Skewness deviation | kurtosis | skewness | Variance | SD | Mean | N | Variables |
| 0.000 | 4104.727 | 4.688 | 12.499 | 0.280 | 1.786 | 1.336 | 0.498 | 1680 | The sum of industries |

1. The description of “electronic devices industry” beta: the beta of “electronic devices industry” with the mean 0.158 and SD and variance 0.692 and 0.479, respectively had negative skewness and positive kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
2. The description of “technical and engineering industry” beta: the beta of “technical and engineering industry” with the mean 0.456 and SD and variance 1.706 and 2.912, respectively had negative skewness and positive kurtosis. The deviation of skewness was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was bigger than 0.05 and it supported the lack of normality rejection of the distribution of this variable.
3. The description of “oil product industry” beta: the beta of “oil product industry” with the mean 0.368 and SD and variance 1.110 and 1.231, respectively had negative skewness and positive kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
4. The description of “main metals industry” beta: the beta of “oil product industry” with the mean 1.057 and SD and variance 1.899 and 3.606, respectively had negative skewness and positive kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
5. The description of “Transportation industry” beta: the beta of “Transportation industry” with the mean 0.932 and SD and variance 0.970 and 3.880, respectively had positive skewness and kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
6. The description of “non-metal mineral industry” beta: the beta of “non-metal mineral industry” with the mean 0.248 and SD and variance 0.530 and 0.281, respectively had positive skewness and kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was bigger than 0.05 and it supported the lack of normality rejection of the distribution of this variable.
7. The description of “metal mineral industry” beta: the beta of “metal mineral industry” with the mean 1.271 and SD and variance 1.509 and 2.276, respectively had negative skewness and positive kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was bigger than 0.05 and it supported the lack of normality rejection of the distribution of this variable.
8. The description of “car industry” beta: the beta of “car industry” with the mean 0.985 and SD and variance 1.063 and 1.130, respectively had positive skewness and kurtosis. The deviation of skewness and kurtosis was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
9. The description of “Rubber industry” beta: the beta of “Rubber industry” with the mean 0.157and SD and variance 1.477 and 2.180, respectively had negative skewness and positive kurtosis. The deviation of skewness was smaller than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
10. The description of “Metal materials industry” beta: the beta of “Metal materials industry” with the mean 0.431and SD and variance 0.969 and 0.939, respectively had negative skewness and positive kurtosis. The deviation of skewness was smaller than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was bigger than 0.05 and it supported the lack of normality rejection of the distribution of this variable.
11. The description of “paper materials industry” beta: the beta of “paper materials industry” with the mean 0.152and SD and variance 1.541 and 2.374, respectively had negative skewness and positive kurtosis. The deviation of skewness was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
12. The description of “Wooden materials industry” beta: the beta of “Wooden materials industry” with the mean 0.044 and SD and variance 1.273 and 1.621, respectively had negative skewness and positive kurtosis. The deviation of skewness was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
13. The description of “financial industry” beta: the beta of “financial industry” with the mean 0.794 and SD and variance 0.835 and 0.698, respectively had positive skewness and kurtosis. The deviation of skewness was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was bigger than 0.05 and it supported the lack of normality rejection of the distribution of this variable.
14. The description of “textile industry” beta: the beta of “textile industry” with the mean 0.092 and SD and variance 0.761 and 0.580, respectively had positive skewness and kurtosis. The deviation of skewness was smaller than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.

Table 2: The descriptive measures by separated beta of sampled industries

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Significance level of KS test | Kurtosis deviation | Skewness deviation | kurtosis | skewness | Variance | SD | Mean | N | Variables |
| .005 | 18.453 | -7.742 | 9.589 | -2.033 | 0.479 | 0.692 | 0.158 | 84 | Electronic devices |
| .197 | 4.722 | -1.324 | 2.454 | -0.348 | 2.912 | 1.706 | 0.456 | 84 | Technical and engineering |
| .014 | 13.125 | -2.656 | 6.820 | -0.698 | 1.231 | 1.110 | 0.368 | 84 | Oil products |
| .018 | 23.180 | -7.721 | 12.046 | -2.028 | 3.606 | 1.899 | 1.057 | 84 | Main metals |
| .000 | 15.408 | 10.224 | 8.007 | 2.685 | 3.880 | 1.970 | 0.932 | 84 | Transportation |
| .061 | 17.559 | 5.454 | 9.125 | 1.433 | 0.281 | 0.530 | 0.248 | 84 | Non-metal minerals |
| .105 | 11.457 | -1.192 | 5.954 | -0.313 | 2.276 | 1.509 | 1.271 | 84 | metal minerals |
| .046 | 1.379 | 4.310 | 0.717 | 1.132 | 1.130 | 1.063 | 0.985 | 84 | Car |
| .000 | 18.073 | -0.111 | 9.392 | -0.029 | 2.180 | 1.477 | 0.157 | 84 | Rubber |
| .060 | 11.116 | -1.592 | 5.777 | -0.418 | 0.939 | 0.969 | 0.431 | 84 | Metal materials |
| .000 | 48.287 | -8.028 | 25.093 | -2.108 | 2.374 | 1.541 | 0.152 | 84 | Paper materials |
| .000 | 51.426 | -4.867 | 26.724 | -1.278 | 1.621 | 1.273 | 0.044 | 84 | Wooden materials |
| .706 | 1.341 | 2.254 | 0.697 | 0.592 | 0.698 | 0.835 | 0.794 | 84 | Financial |
| .000 | 27.788 | 1.785 | 14.440 | 0.469 | 0.580 | 0.761 | 0.092 | 84 | Textile |
| .001 | 11.963 | 8.406 | 6.217 | 2.208 | 1.312 | 1.146 | 0.0480 | 84 | Machineries |
| .000 | 73.204 | -20.946 | 38.041 | -5.501 | 0.768 | 0.876 | 0.046 | 84 | Furniture |
| .016 | 10.492 | -1.510 | 5.452 | -0.397 | 3.390 | 1.841 | 1.099 | 84 | Contracting |
| .002 | 6.947 | -0.455 | 3.610 | -0.119 | 1.062 | 1.030 | 0.166 | 84 | Computer |
| .003 | 25.541 | 11.599 | 13.272 | 3.047 | 1.740 | 1.319 | 0.906 | 84 | Chemical |
| .016 | 14.737 | 5.762 | 7.658 | 1.514 | 0.360 | 0.600 | 0.180 | 84 | Food (except sugar) |

1. The description of “machineries industry” beta: the beta of “machineries industry” with the mean 0.480 and SD and variance 1.146 and 1.312, respectively had positive skewness and kurtosis. The deviation of skewness was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
2. The description of “furniture industry” beta: the beta of “furniture industry” with the mean -0.046 and SD and variance 0.876 and 0.768, respectively had negative skewness and positive kurtosis. The deviation of skewness was bigger than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
3. The description of “contractor industry” beta: the beta of “contractor industry” with the mean -1.099 and SD and variance 1.841 and 3.390, respectively had negative skewness and positive kurtosis. The deviation of skewness was smaller than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
4. The description of “computer industry” beta: the beta of “computer industry” with the mean 0.166 and SD and variance 1.030 and 1.062, respectively had negative skewness and positive kurtosis. The deviation of skewness was smaller than absolute value 1.96. The negative skewness showed the observations far from central measures in the left side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
5. The description of “chemical industry” beta: the beta of “chemical industry” with the mean 0.906 and SD and variance 1.319 and 1.740, respectively had positive skewness and kurtosis. The deviation of skewness was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.
6. The description of “food industry (except sugar)” beta: the beta of “food industry (except sugar)” with the mean 0.180 and SD and variance 0.600 and 0.360, respectively had positive skewness and kurtosis. The deviation of skewness was bigger than absolute value 1.96. The positive skewness showed the observations far from central measures in the right side of the scale and positive kurtosis showed the distribution curve longer than normal distribution curve. The significance level of Kolmogrov-Smirnov test was less than 0.05 and it supported the normality rejection of the distribution of this variable.

Based on the research purpose, the comparison of the mean among some independent population was the best method for hypothesis test. To use the mean comparison test among the 20 industries, one-way variance analysis test was applied. This test needs the justification of fundamental assumptions. The first assumption that is not ignored is the minimum distance of the measurement scale. The variable of the study can be justified. The other hypothesis is the normality of the distribution of study variables and beta variable distribution was not normal in most of the industries but the big sample size is ignored. The other assumption is the equal variance that is ignored by the equal volume of the observations. To evaluate the distribution normality and homogeneity of variance, Kolmogrov-Smirnov was applied.

To compare the mean of systematic risk size among 20 industries, mean comparison test of some independent population, one-way variance analysis was used. To respond the study hypothesis, H0, H1 were tests.

H0=The mean systematic risk was not significantly different among various industries.

H1= The mean systematic risk was not significantly different among various industries.



**Table 3: Descriptive measures of systematic risk variable of the study**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SD Error | SD | Mean | N (monthly observations) | Variable |
| .07550 | .69193 | .1582 | 84 | Electronic devices |
| .18619 | 1.70643 | .4558 | 84 | Technical and engineering |
| .12106 | 1.10956 | .3677 | 84 | Oil products |
| .20719 | 1.89895 | 1.0565 | 84 | Main metals |
| .21492 | 1.96981 | .9324 | 84 | Transportation |
| .05781 | .52982 | .2485 | 84 | Non-metal minerals |
| .16460 | 1.50856 | 1.2709 | 84 | metal minerals |
| .11597 | 1.06289 | .9851 | 84 | Car |
| .16111 | 1.47661 | .1572 | 84 | Rubber |
| .10571 | .96880 | .4309 | 84 | Metal materials |
| .16811 | 1.54079 | .1518 | 84 | Paper materials |
| .13891 | 1.27310 | .0437 | 84 | Wooden materials |
| .09115 | .83537 | .7940 | 84 | Financial |
| .08306 | .76129 | .0924 | 84 | Textile |
| .12500 | 1.14560 | .4798 | 84 | Machineries |
| .09559 | .87609 | -.0463 | 84 | Furniture |
| .20089 | 1.84114 | 1.0985 | 84 | Contracting |
| .11242 | 1.03035 | .1664 | 84 | Computer |
| .14394 | 1.31920 | .9064 | 84 | Chemical |
| .06543 | .59966 | .1797 | 84 | Food (except sugar) |

Based on the test result, f calculated statistics with 8.800 was bigger than critical value and the significance level was less than 0.01. Thus, in addition to confidence interval 95%, at confidence interval 99%, there are required evidences to reject null hypothesis. Based on the results of H1 hypothesis as the difference in systematic risk among 20 industries were accepted. This result showed that at least there is a significant difference among the compared industries. Thus, to compare two by two industries, Scheffe post test was applied. This post test is used because it is more efficient when the variables distribution is not normal and inter-group variance is heterogeneous. In other words, in this condition, this post test is conservative. According to the results of Scheffe post test, the studied industries including 20 industries were classified into three groups. The results of the classification are shown in Table 4. By comparison of Scheffe post test, furniture industry has the lowest systematic risk. The systematic risk of this industry compared to three industries of main metals, contracting and metal minerals were significantly small. But it didn’t have significant difference with other industries.

Metal minerals industry had the highest systematic risk. The systematic risk of the industry was significantly high compared to seven industries of wooden materials, textile, paper materials, rubber, electronic devices, computer, food and furniture and it didn’t have significant difference with other industries.

According to the comparison of Scheffe post test, nine industries including non-metal minerals, oil products, metal materials, technical and engineering, machineries, financial, chemical, transportation and car didn’t have significant difference and they didn’t have significant difference with none of the other industries.

**Table 4: The results of hypothesis test based on one-way variance analysis**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Error level | statistics F | Mean of square | Degree of freedom | The sum of squares | Variable and group |
| 0.000 | 8.80 | 14.439 | 19 | 274.349 | Inter-group | Systematic risk |
|  |  | 1.641 | 1660 | 2723.77 | Intragroup |
|  |  |  | 1679 | 2998.11 | Sum |

**Table 5: The results of Scheffe post test among 20 industries**

|  |  |  |
| --- | --- | --- |
| The classification based on 0.05 level | The number of observations | Industry |
| Group 3 | Group 2 | Group 1 |
|  |  | -.0463 | 84 | Furniture |
|  | .0437 | .0437 | 84 | Wooden materials |
|  | .0924 | .0924 | 84 | Textile |
|  | .1518 | .1518 |  | Paper materials |
|  | .1572 | .1572 |  | Rubber |
|  | .1582 | .1582 | 84 | Electronic devices |
|  | .1664 | .1664 | 84 | Computer |
|  | .1797 | .1797 | 84 | Food (except sugar) |
| .2485 | .2485 | .2485 | 84 | Non-metal minerals |
| .3677 | .3677 | .3677 | 84 | Oil products |
| .4309 | .4309 | .4309 | 84 | Metal materials |
| .4558 | .4558 | .4558 | 84 | Technical and engineering |
| .4798 | .4798 | .4798 | 84 | Machineries |
| .7940 | .7940 | .7940 | 84 | Financial |
| .9064 | .9064 | .9064 | 84 | Chemical |
| .9324 | .9324 | .9324 | 84 | Transportation |
| .9851 | .9851 | .9851 | 84 | Car |
| 1.0565 | 1.0565 |  | 84 | Main metals |
| 1.0985 | 1.0985 |  | 84 | Contracting |
| 1.2709 |  |  | 84 | metal minerals |
| .112 | .076 | 0.101 |  | Significance level |

The details of the two by two comparison results of the industries based on Scheffe post test are as:

1. The comparison of the electronic devices industry with other industries: The mean of this industry is significantly smaller than metal minerals and it doesn’t have significant difference with other industries.

**Table 6: The results of Tukey post test to compare electronic devices industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard err or | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | -.29754 | Technical and engineering | Electronic devices |
| The difference is not significant | 1.000 | .19765 | -.20950 | Oil products | Electronic devices |
| The difference is not significant | .358 | .19765 | -.89827 | Main metals | Electronic devices |
| The difference is not significant | .700 | .19765 | -.77419 | Transportation | Electronic devices |
| The difference is not significant | 1.000 | .19765 | -.09026 | Non-metal minerals | Electronic devices |
| It is smaller significantly | .035 | .19765 | -1.11268(\*) | metal minerals | Electronic devices |
| The difference is not significant | .556 | .19765 | -.82690 | Car | Electronic devices |
| The difference is not significant | 1.000 | .19765 | .00107 | Rubber | Electronic devices |
| The difference is not significant | 1.000 | .19765 | -.27264 | Metal materials | Electronic devices |
| The difference is not significant | 1.000 | .19765 | .00640 | Paper materials | Electronic devices |
| The difference is not significant | 1.000 | .19765 | .11457 | Wooden materials | Electronic devices |
| The difference is not significant | .943 | .19765 | -.63572 | Financial | Electronic devices |
| The difference is not significant | 1.000 | .19765 | .06587 | Textile | Electronic devices |
| The difference is not significant | 1.000 | .19765 | -.32152 | Machineries | Electronic devices |
| The difference is not significant | 1.000 | .19765 | .20451 | Furniture | Electronic devices |
| The difference is not significant | .256 | .19765 | -.94027 | Contracting | Electronic devices |
| The difference is not significant | 1.000 | .19765 | -.00815 | Computer | Electronic devices |
| The difference is not significant | .764 | .19765 | -.74814 | Chemical | Electronic devices |
| The difference is not significant | 1.000 | .19765 | -.02143 | Food (except sugar) | Electronic devices |

1. The comparison of technical and engineering industry with other industries: The mean of this industry doesn’t have significant difference with other industries.

**Table 7: The results of Tukey post test to compare the technical engineering industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | .29754 | Electronic devices | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .08805 | Oil products | Technical and engineering |
| The difference is not significant | .969 | .19765 | -.60073 | Main metals | Technical and engineering |
| The difference is not significant | .998 | .19765 | -.47665 | Transportation | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .20729 | Non-metal minerals | Technical and engineering |
| The difference is not significant | .589 | .19765 | -.81514 | metal minerals | Technical and engineering |
| The difference is not significant | .993 | .19765 | -.52936 | Car | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .29861 | Rubber | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .02490 | Metal materials | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .30394 | Paper materials | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .41212 | Wooden materials | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | -.33818 | Financial | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .36341 | Textile | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | -.02398 | Machineries | Technical and engineering |
| The difference is not significant | .997 | .19765 | .50205 | Furniture | Technical and engineering |
| The difference is not significant | .937 | .19765 | -.64273 | Contracting | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .28939 | Computer | Technical and engineering |
| The difference is not significant | .999 | .19765 | -.45060 | Chemical | Technical and engineering |
| The difference is not significant | 1.000 | .19765 | .27611 | Food (except sugar) | Technical and engineering |

1. The comparison of oil product industry with other industries: The mean of this industry doesn’t have significant difference with other industries.

**Table 8: The results of Tukey post test to compare the oil product industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | .20950 | Electronic devices | Oil products |
| The difference is not significant | 1.000 | .19765 | -.08805 | Technical and engineering | Oil products |
| The difference is not significant | .879 | .19765 | -.68878 | Main metals | Oil products |
| The difference is not significant | .985 | .19765 | -.56470 | Transportation | Oil products |
| The difference is not significant | 1.000 | .19765 | .11924 | Non-metal minerals | Oil products |
| The difference is not significant | .345 | .19765 | -.90318 | metal minerals | Oil products |
| The difference is not significant | .958 | .19765 | -.61741 | Car | Oil products |
| The difference is not significant | 1.000 | .19765 | .21056 | Rubber | Oil products |
| The difference is not significant | 1.000 | .19765 | -.06315 | Metal materials | Oil products |
| The difference is not significant | 1.000 | .19765 | .21589 | Paper materials | Oil products |
| The difference is not significant | 1.000 | .19765 | .32407 | Wooden materials | Oil products |
| The difference is not significant | 1.000 | .19765 | -.42623 | Financial | Oil products |
| The difference is not significant | 1.000 | .19765 | .27537 | Textile | Oil products |
| The difference is not significant | 1.000 | .19765 | -.11202 | Machineries | Oil products |
| The difference is not significant | 1.000 | .19765 | .41400 | Furniture | Oil products |
| The difference is not significant | .802 | .19765 | -.73077 | Contracting | Oil products |
| The difference is not significant | 1.000 | .19765 | .20135 | Computer | Oil products |
| The difference is not significant | .991 | .19765 | -.53864 | Chemical | Oil products |
| The difference is not significant | 1.000 | .19765 | .18806 | Food (except sugar) | Oil products |

1. The comparison of Main metals industry with other industries: The mean of this industry doesn’t have significant difference with other industries.

**Table 9: The results of Tukey post test to compare the Main metals industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | .358 | .19765 | .89827 | Electronic devices | Main metals |
| The difference is not significant | .969 | .19765 | .60073 | Technical and engineering | Main metals |
| The difference is not significant | .879 | .19765 | .68878 | Oil products | Main metals |
| The difference is not significant | 1.000 | .19765 | .12408 | Transportation | Main metals |
| The difference is not significant | .609 | .19765 | .80802 | Non-metal minerals | Main metals |
| The difference is not significant | 1.000 | .19765 | -.21441 | metal minerals | Main metals |
| The difference is not significant | 1.000 | .19765 | .07137 | Car | Main metals |
| The difference is not significant | .355 | .19765 | .89934 | Rubber | Main metals |
| The difference is not significant | .952 | .19765 | .62563 | Metal materials | Main metals |
| The difference is not significant | .341 | .19765 | .90467 | Paper materials | Main metals |
| The difference is not significant | .125 | .19765 | 1.01285 | Wooden materials | Main metals |
| The difference is not significant | 1.000 | .19765 | .26255 | Financial | Main metals |
| The difference is not significant | .206 | .19765 | .96415 | Textile | Main metals |
| The difference is not significant | .980 | .19765 | .57675 | Machineries | Main metals |
| The difference is not significant | .040 | .19765 | 1.10278(\*) | Furniture | Main metals |
| The difference is not significant | 1.000 | .19765 | -.04200 | Contracting | Main metals |
| The difference is not significant | .379 | .19765 | .89012 | Computer | Main metals |
| The difference is not significant | 1.000 | .19765 | .15013 | Chemical | Main metals |
| The difference is not significant | .415 | .19765 | .87684 | Food (except sugar) | Main metals |

1. The comparison of Transportation industry with other industries: The mean of this industry doesn’t have significant difference with other industries.

**Table 10: The results of Tukey post test to compare the Transportation industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | .700 | .19765 | .77419 | Electronic devices | Transportation |
| The difference is not significant | .998 | .19765 | .47665 | Technical and engineering | Transportation |
| The difference is not significant | .985 | .19765 | .56470 | Oil products | Transportation |
| The difference is not significant | 1.000 | .19765 | -.12408 | Main metals | Transportation |
| The difference is not significant | .886 | .19765 | .68394 | Non-metal minerals | Transportation |
| The difference is not significant | 1.000 | .19765 | -.33849 | metal minerals | Transportation |
| The difference is not significant | 1.000 | .19765 | -.05271 | Car | Transportation |
| The difference is not significant | .697 | .19765 | .77526 | Rubber | Transportation |
| The difference is not significant | .997 | .19765 | .50155 | Metal materials | Transportation |
| The difference is not significant | .684 | .19765 | .78059 | Paper materials | Transportation |
| The difference is not significant | .383 | .19765 | .88876 | Wooden materials | Transportation |
| The difference is not significant | 1.000 | .19765 | .13847 | Financial | Transportation |
| The difference is not significant | .519 | .19765 | .84006 | Textile | Transportation |
| The difference is not significant | .999 | .19765 | .45267 | Machineries | Transportation |
| The difference is not significant | .179 | .19765 | .97870 | Furniture | Transportation |
| The difference is not significant | 1.000 | .19765 | -.16608 | Contracting | Transportation |
| The difference is not significant | .721 | .19765 | .76604 | Computer | Transportation |
| The difference is not significant | 1.000 | .19765 | .02605 | Chemical | Transportation |
| The difference is not significant | .753 | .19765 | .75276 | Food (except sugar) | Transportation |

1. The comparison of Non-metal minerals industry with other industries: The mean of this industry doesn’t have significant difference with other industries.

**Table 11: The results of Tukey post test to compare the Non-metal minerals industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | .09026 | Electronic devices | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | -.20729 | Technical and engineering | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | -.11924 | Oil products | Non-metal minerals |
| The difference is not significant | .609 | .19765 | -.80802 | Main metals | Non-metal minerals |
| The difference is not significant | .886 | .19765 | -.68394 | Transportation | Non-metal minerals |
| The difference is not significant | .112 | .19765 | -1.02242 | Metal minerals | Non-metal minerals |
| The difference is not significant | .789 | .19765 | -.73665 | Car | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | .09132 | Rubber | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | -.18239 | Metal materials | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | .09665 | Paper materials | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | .20483 | Wooden materials | Non-metal minerals |
| The difference is not significant | .990 | .19765 | -.54547 | Financial | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | .15613 | Textile | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | -.23126 | Machineries | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | .29476 | Furniture | Non-metal minerals |
| The difference is not significant | .490 | .19765 | -.85001 | Contracting | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | .08211 | Computer | Non-metal minerals |
| The difference is not significant | .920 | .19765 | -.65788 | Chemical | Non-metal minerals |
| The difference is not significant | 1.000 | .19765 | .06882 | Food (except sugar) | Non-metal minerals |

1. The comparison of metal minerals industry with other industries: The mean of this industry was significantly higher than rubber, textile, computer, furniture and food except sugar and it didn’t have significant difference with other industries.

**Table 12: The results of Tukey post test to compare the metal minerals industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | .035 | .19765 | 1.11268(\*) | Electronic devices | Metal minerals |
| The difference is not significant | .589 | .19765 | .81514 | Technical and engineering | Metal minerals |
| The difference is not significant | .345 | .19765 | .90318 | Oil products | Metal minerals |
| The difference is not significant | 1.000 | .19765 | .21441 | Main metals | Metal minerals |
| The difference is not significant | 1.000 | .19765 | .33849 | Transportation | Metal minerals |
| The difference is not significant | .112 | .19765 | 1.02242 | Non-metal minerals | Metal minerals |
| The difference is not significant | 1.000 | .19765 | .28577 | Car | Metal minerals |
| It is bigger significantly | .035 | .19765 | 1.11375(\*) | Rubber | Metal minerals |
| The difference is not significant | .519 | .19765 | .84003 | Metal materials | Metal minerals |
| The difference is not significant | .032 | .19765 | 1.11907(\*) | Paper materials | Metal minerals |
| The difference is not significant | .005 | .19765 | 1.22725(\*) | Wooden materials | Metal minerals |
| The difference is not significant | .998 | .19765 | .47696 | Financial | Metal minerals |
| It is bigger significantly | .013 | .19765 | 1.17855(\*) | Textile | Metal minerals |
| The difference is not significant | .655 | .19765 | .79116 | Machineries | Metal minerals |
| It is bigger significantly | .001 | .19765 | 1.31719(\*) | Furniture | Metal minerals |
| The difference is not significant | 1.000 | .19765 | .17241 | Contracting | Metal minerals |
| It is bigger significantly | .039 | .19765 | 1.10453(\*) | Computer | Metal minerals |
| The difference is not significant | 1.000 | .19765 | .36454 | Chemical | Metal minerals |
| It is bigger significantly | .047 | .19765 | 1.09125(\*) | Food (except sugar) | Metal minerals |

1. The comparison of car industry with other industries: The mean of this industry didn’t have significant difference with other industries.

**Table 13: The results of Tukey post test to compare the car industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | .556 | .19765 | .82690 | Electronic devices | Car |
| The difference is not significant | .993 | .19765 | .52936 | Technical and engineering | Car |
| The difference is not significant | .958 | .19765 | .61741 | Oil products | Car |
| The difference is not significant | 1.000 | .19765 | -.07137 | Main metals | Car |
| The difference is not significant | 1.000 | .19765 | .05271 | Transportation | Car |
| The difference is not significant | .789 | .19765 | .73665 | Non-metal minerals | Car |
| The difference is not significant | 1.000 | .19765 | -.28577 | Metal minerals | Car |
| The difference is not significant | .553 | .19765 | .82797 | Rubber | Car |
| The difference is not significant | .988 | .19765 | .55426 | Metal materials | Car |
| The difference is not significant | .538 | .19765 | .83330 | Paper materials | Car |
| The difference is not significant | .253 | .19765 | .94148 | Wooden materials | Car |
| The difference is not significant | 1.000 | .19765 | .19118 | Financial | Car |
| The difference is not significant | .372 | .19765 | .89278 | Textile | Car |
| The difference is not significant | .996 | .19765 | .50539 | Machineries | Car |
| The difference is not significant | .101 | .19765 | 1.03141 | Furniture | Car |
| The difference is not significant | 1.000 | .19765 | -.11337 | Contracting | Car |
| The difference is not significant | .579 | .19765 | .81875 | Computer | Car |
| The difference is not significant | 1.000 | .19765 | .07876 | Chemical | Car |
| The difference is not significant | .616 | .19765 | .80547 | Food (except sugar) | Car |

1. The comparison of rubber industry with other industries: The mean of this industry didn’t have significant difference with other industries.

**Table 14: The results of Tukey post test to compare the rubber industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | -.00107 | Electronic devices | Rubber |
| The difference is not significant | 1.000 | .19765 | -.29861 | Technical and engineering | Rubber |
| The difference is not significant | 1.000 | .19765 | -.21056 | Oil products | Rubber |
| The difference is not significant | .355 | .19765 | -.89934 | Main metals | Rubber |
| The difference is not significant | .697 | .19765 | -.77526 | Transportation | Rubber |
| The difference is not significant | 1.000 | .19765 | -.09132 | Non-metal minerals | Rubber |
| The difference is not significant | .035 | .19765 | -1.11375(\*) | Metal minerals | Rubber |
| The difference is not significant | .553 | .19765 | -.82797 | Car | Rubber |
| The difference is not significant | 1.000 | .19765 | -.27371 | Metal materials | Rubber |
| The difference is not significant | 1.000 | .19765 | .00533 | Paper materials | Rubber |
| The difference is not significant | 1.000 | .19765 | .11351 | Wooden materials | Rubber |
| The difference is not significant | .942 | .19765 | -.63679 | Financial | Rubber |
| The difference is not significant | 1.000 | .19765 | .06481 | Textile | Rubber |
| The difference is not significant | 1.000 | .19765 | -.32259 | Machineries | Rubber |
| The difference is not significant | 1.000 | .19765 | .20344 | Furniture | Rubber |
| The difference is not significant | .253 | .19765 | -.94134 | Contracting | Rubber |
| The difference is not significant | 1.000 | .19765 | -.00922 | Computer | Rubber |
| The difference is not significant | .761 | .19765 | -.74921 | Chemical | Rubber |
| The difference is not significant | 1.000 | .19765 | -.02250 | Food (except sugar) | Rubber |

1. The comparison of metal materials industry with other industries: The mean of this industry didn’t have significant difference with other industries.

**Table 15: The results of Tukey post test to compare the metal materials industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | .27264 | Electronic devices | Metal materials |
| The difference is not significant | 1.000 | .19765 | -.02490 | Technical and engineering | Metal materials |
| The difference is not significant | 1.000 | .19765 | .06315 | Oil products | Metal materials |
| The difference is not significant | .952 | .19765 | -.62563 | Main metals | Metal materials |
| The difference is not significant | .997 | .19765 | -.50155 | Transportation | Metal materials |
| The difference is not significant | 1.000 | .19765 | .18239 | Non-metal minerals | Metal materials |
| The difference is not significant | .519 | .19765 | -.84003 | Metal minerals | Metal materials |
| The difference is not significant | .988 | .19765 | -.55426 | Car | Metal materials |
| The difference is not significant | 1.000 | .19765 | .27371 | Rubber | Metal materials |
| The difference is not significant | 1.000 | .19765 | .27904 | Paper materials | Metal materials |
| The difference is not significant | 1.000 | .19765 | .38722 | Wooden materials | Metal materials |
| The difference is not significant | 1.000 | .19765 | -.36308 | Financial | Metal materials |
| The difference is not significant | 1.000 | .19765 | .33852 | Textile | Metal materials |
| The difference is not significant | 1.000 | .19765 | -.04887 | Machineries | Metal materials |
| The difference is not significant | .998 | .19765 | .47715 | Furniture | Metal materials |
| The difference is not significant | .909 | .19765 | -.66763 | Contracting | Metal materials |
| The difference is not significant | 1.000 | .19765 | .26449 | Computer | Metal materials |
| The difference is not significant | .998 | .19765 | -.47550 | Chemical | Metal materials |
| The difference is not significant | 1.000 | .19765 | .25121 | Food (except sugar) | Metal materials |

1. The comparison of paper materials industry with other industries: The mean of this industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries.

**Table 16: The results of Tukey post test to compare the paper materials industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | -.00640 | Electronic devices | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.30394 | Technical and engineering | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.21589 | Oil products | Paper materials |
| The difference is not significant | .341 | .19765 | -.90467 | Main metals | Paper materials |
| The difference is not significant | .684 | .19765 | -.78059 | Transportation | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.09665 | Non-metal minerals | Paper materials |
| It is significantly small | .032 | .19765 | -1.11907(\*) | Metal minerals | Paper materials |
| The difference is not significant | .538 | .19765 | -.83330 | Car | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.00533 | Rubber | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.27904 | Metal materials | Paper materials |
| The difference is not significant | 1.000 | .19765 | .10818 | Wooden materials | Paper materials |
| The difference is not significant | .937 | .19765 | -.64212 | Financial | Paper materials |
| The difference is not significant | 1.000 | .19765 | .05948 | Textile | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.32791 | Machineries | Paper materials |
| The difference is not significant | 1.000 | .19765 | .19811 | Furniture | Paper materials |
| The difference is not significant | .242 | .19765 | -.94666 | Contracting | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.01454 | Computer | Paper materials |
| The difference is not significant | .749 | .19765 | -.75454 | Chemical | Paper materials |
| The difference is not significant | 1.000 | .19765 | -.02783 | Food (except sugar) | Paper materials |

1. The comparison of wooden materials industry with other industries: The mean of this industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries.

**Table 17: The results of Tukey post test to compare the wooden materials industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | -.11457 | Electronic devices | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.41212 | Technical and engineering | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.32407 | Oil products | Wooden materials |
| The difference is not significant | .125 | .19765 | -1.01285 | Main metals | Wooden materials |
| The difference is not significant | .383 | .19765 | -.88876 | Transportation | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.20483 | Non-metal minerals | Wooden materials |
| It is significantly smaller | .005 | .19765 | -1.22725(\*) | Metal minerals | Wooden materials |
| The difference is not significant | .253 | .19765 | -.94148 | Car | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.11351 | Rubber | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.38722 | Metal materials | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.10818 | Paper materials | Wooden materials |
| The difference is not significant | .759 | .19765 | -.75029 | Financial | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.04870 | Textile | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.43609 | Machineries | Wooden materials |
| The difference is not significant | 1.000 | .19765 | .08993 | Furniture | Wooden materials |
| The difference is not significant | .076 | .19765 | -1.05484 | Contracting | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.12272 | Computer | Wooden materials |
| The difference is not significant | .454 | .19765 | -.86271 | Chemical | Wooden materials |
| The difference is not significant | 1.000 | .19765 | -.13601 | Food (except sugar) | Wooden materials |

1. The comparison of financial industry with other industries: The mean of this industry didn’t have significant difference with other industries.

**Table 18: The results of Tukey post test to compare the financial industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | .943 | .19765 | .63572 | Electronic devices | Financial |
| The difference is not significant | 1.000 | .19765 | .33818 | Technical and engineering | Financial |
| The difference is not significant | 1.000 | .19765 | .42623 | Oil products | Financial |
| The difference is not significant | 1.000 | .19765 | -.26255 | Main metals | Financial |
| The difference is not significant | 1.000 | .19765 | -.13847 | Transportation | Financial |
| The difference is not significant | .990 | .19765 | .54547 | Non-metal minerals | Financial |
| The difference is not significant | .998 | .19765 | -.47696 | Metal minerals | Financial |
| The difference is not significant | 1.000 | .19765 | -.19118 | Car | Financial |
| The difference is not significant | .942 | .19765 | .63679 | Rubber | Financial |
| The difference is not significant | 1.000 | .19765 | .36308 | Metal materials | Financial |
| The difference is not significant | .937 | .19765 | .64212 | Paper materials | Financial |
| The difference is not significant | .759 | .19765 | .75029 | Wooden materials | Financial |
| The difference is not significant | .858 | .19765 | .70159 | Textile | Financial |
| The difference is not significant | 1.000 | .19765 | .31420 | Machineries | Financial |
| The difference is not significant | .518 | .19765 | .84023 | Furniture | Financial |
| The difference is not significant | 1.000 | .19765 | -.30455 | Contracting | Financial |
| The difference is not significant | .950 | .19765 | .62757 | Computer | Financial |
| The difference is not significant | 1.000 | .19765 | -.11242 | Chemical | Financial |
| The difference is not significant | .960 | .19765 | .61429 | Food (except sugar) | Financial |

1. The comparison of textile industry with other industries: The mean of this industry was significantly smaller than metal minerals and didn’t have significant difference with other industries.

**Table 19: The results of Tukey post test to compare the textile industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | -.06587 | Electronic devices | Textile |
| The difference is not significant | 1.000 | .19765 | -.36341 | Technical and engineering | Textile |
| The difference is not significant | 1.000 | .19765 | -.27537 | Oil products | Textile |
| The difference is not significant | .206 | .19765 | -.96415 | Main metals | Textile |
| The difference is not significant | .519 | .19765 | -.84006 | Transportation | Textile |
| The difference is not significant | 1.000 | .19765 | -.15613 | Non-metal minerals | Textile |
| It is significantly smaller | .013 | .19765 | -1.17855(\*) | Metal minerals | Textile |
| The difference is not significant | .372 | .19765 | -.89278 | Car | Textile |
| The difference is not significant | 1.000 | .19765 | -.06481 | Rubber | Textile |
| The difference is not significant | 1.000 | .19765 | -.33852 | Metal materials | Textile |
| The difference is not significant | 1.000 | .19765 | -.05948 | Paper materials | Textile |
| The difference is not significant | 1.000 | .19765 | .04870 | Wooden materials | Textile |
| The difference is not significant | .858 | .19765 | -.70159 | Financial | Textile |
| The difference is not significant | 1.000 | .19765 | -.38739 | Machineries | Textile |
| The difference is not significant | 1.000 | .19765 | .13863 | Furniture | Textile |
| The difference is not significant | .135 | .19765 | -1.00614 | Contracting | Textile |
| The difference is not significant | 1.000 | .19765 | -.07402 | Computer | Textile |
| The difference is not significant | .593 | .19765 | -.81401 | Chemical | Textile |
| The difference is not significant | 1.000 | .19765 | -.08731 | Food (except sugar) | Textile |

1. The comparison of Machineries industry with other industries: The mean of this industry didn’t have significant difference with other industries.

**Table 20: The results of Tukey post test to compare the Machineries industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | .32152 | Electronic devices | Machineries |
| The difference is not significant | 1.000 | .19765 | .02398 | Technical and engineering | Machineries |
| The difference is not significant | 1.000 | .19765 | .11202 | Oil products | Machineries |
| The difference is not significant | .980 | .19765 | -.57675 | Main metals | Machineries |
| The difference is not significant | .999 | .19765 | -.45267 | Transportation | Machineries |
| The difference is not significant | 1.000 | .19765 | .23126 | Non-metal minerals | Machineries |
| The difference is not significant | .655 | .19765 | -.79116 | Metal minerals | Machineries |
| The difference is not significant | .996 | .19765 | -.50539 | Car | Machineries |
| The difference is not significant | 1.000 | .19765 | .32259 | Rubber | Machineries |
| The difference is not significant | 1.000 | .19765 | .04887 | Metal materials | Machineries |
| The difference is not significant | 1.000 | .19765 | .32791 | Paper materials | Machineries |
| The difference is not significant | 1.000 | .19765 | .43609 | Wooden materials | Machineries |
| The difference is not significant | 1.000 | .19765 | -.31420 | Financial | Machineries |
| The difference is not significant | 1.000 | .19765 | .38739 | Textile | Machineries |
| The difference is not significant | .994 | .19765 | .52602 | Furniture | Machineries |
| The difference is not significant | .957 | .19765 | -.61875 | Contracting | Machineries |
| The difference is not significant | 1.000 | .19765 | .31337 | Computer | Machineries |
| The difference is not significant | 1.000 | .19765 | -.42662 | Chemical | Machineries |
| The difference is not significant | 1.000 | .19765 | .30008 | Food (except sugar) | Machineries |

1. The comparison of furniture industry with other industries: The mean of this industry was significantly smaller than metal minerals, contracting and main metals and it didn’t have significant difference with other industries.

**Table 21: The results of Tukey post test to compare the furniture industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | -.20451 | Electronic devices | Furniture |
| The difference is not significant | .997 | .19765 | -.50205 | Technical and engineering | Furniture |
| The difference is not significant | 1.000 | .19765 | -.41400 | Oil products | Furniture |
| It is significantly smaller | .040 | .19765 | -1.10278(\*) | Main metals | Furniture |
| The difference is not significant | .179 | .19765 | -.97870 | Transportation | Furniture |
| The difference is not significant | 1.000 | .19765 | -.29476 | Non-metal minerals | Furniture |
| It is significantly smaller | .001 | .19765 | -1.31719(\*) | Metal minerals | Furniture |
| The difference is not significant | .101 | .19765 | -1.03141 | Car | Furniture |
| The difference is not significant | 1.000 | .19765 | -.20344 | Rubber | Furniture |
| The difference is not significant | .998 | .19765 | -.47715 | Metal materials | Furniture |
| The difference is not significant | 1.000 | .19765 | -.19811 | Paper materials | Furniture |
| The difference is not significant | 1.000 | .19765 | -.08993 | Wooden materials | Furniture |
| The difference is not significant | .518 | .19765 | -.84023 | Financial | Furniture |
| The difference is not significant | 1.000 | .19765 | -.13863 | Textile | Furniture |
| The difference is not significant | .994 | .19765 | -.52602 | Machineries | Furniture |
| It is significantly smaller. | .022 | .19765 | -1.14478(\*) | Contracting | Furniture |
| The difference is not significant | 1.000 | .19765 | -.21266 | Computer | Furniture |
| The difference is not significant | .229 | .19765 | -.95265 | Chemical | Furniture |
| The difference is not significant | 1.000 | .19765 | -.22594 | Food (except sugar) | Furniture |

1. The comparison of contracting industry with other industries: The mean of this industry was significantly bigger than furniture and it didn’t have significant difference with other industries.

**Table 22: The results of Tukey post test to compare the contracting industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | .256 | .19765 | .94027 | Electronic devices | Contracting |
| The difference is not significant | .937 | .19765 | .64273 | Technical and engineering | Contracting |
| The difference is not significant | .802 | .19765 | .73077 | Oil products | Contracting |
| The difference is not significant | 1.000 | .19765 | .04200 | Main metals | Contracting |
| The difference is not significant | 1.000 | .19765 | .16608 | Transportation | Contracting |
| The difference is not significant | .490 | .19765 | .85001 | Non-metal minerals | Contracting |
| The difference is not significant | 1.000 | .19765 | -.17241 | Metal minerals | Contracting |
| The difference is not significant | 1.000 | .19765 | .11337 | Car | Contracting |
| The difference is not significant | .253 | .19765 | .94134 | Rubber | Contracting |
| The difference is not significant | .909 | .19765 | .66763 | Metal materials | Contracting |
| The difference is not significant | .242 | .19765 | .94666 | Paper materials | Contracting |
| The difference is not significant | .076 | .19765 | 1.05484 | Wooden materials | Contracting |
| The difference is not significant | 1.000 | .19765 | .30455 | Financial | Contracting |
| The difference is not significant | .135 | .19765 | 1.00614 | Textile | Contracting |
| The difference is not significant | .957 | .19765 | .61875 | Machineries | Contracting |
| It is significantly bigger | .022 | .19765 | 1.14478(\*) | Furniture | Contracting |
| The difference is not significant | .274 | .19765 | .93212 | Computer | Contracting |
| The difference is not significant | 1.000 | .19765 | .19213 | Chemical | Contracting |
| The difference is not significant | .306 | .19765 | .91884 | Food (except sugar) | Contracting |

1. The comparison of computer industry with other industries: The mean of this industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries.

**Table 23: The results of Tukey post test to compare the computer industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | .00815 | Electronic devices | Computer |
| The difference is not significant | 1.000 | .19765 | -.28939 | Technical and engineering | Computer |
| The difference is not significant | 1.000 | .19765 | -.20135 | Oil products | Computer |
| The difference is not significant | .379 | .19765 | -.89012 | Main metals | Computer |
| The difference is not significant | .721 | .19765 | -.76604 | Transportation | Computer |
| The difference is not significant | 1.000 | .19765 | -.08211 | Non-metal minerals | Computer |
| It is significantly smaller | .039 | .19765 | -1.10453(\*) | Metal minerals | Computer |
| The difference is not significant | .579 | .19765 | -.81875 | Car | Computer |
| The difference is not significant | 1.000 | .19765 | .00922 | Rubber | Computer |
| The difference is not significant | 1.000 | .19765 | -.26449 | Metal materials | Computer |
| The difference is not significant | 1.000 | .19765 | .01454 | Paper materials | Computer |
| The difference is not significant | 1.000 | .19765 | .12272 | Wooden materials | Computer |
| The difference is not significant | .950 | .19765 | -.62757 | Financial | Computer |
| The difference is not significant | 1.000 | .19765 | .07402 | Textile | Computer |
| The difference is not significant | 1.000 | .19765 | -.31337 | Machineries | Computer |
| The difference is not significant | 1.000 | .19765 | .21266 | Furniture | Computer |
| The difference is not significant | .274 | .19765 | -.93212 | Contracting | Computer |
| The difference is not significant | .782 | .19765 | -.73999 | Chemical | Computer |
| The difference is not significant | 1.000 | .19765 | -.01328 | Food (except sugar) | Computer |

1. The comparison of chemical industry with other industries: The mean of this industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries.

**Table 24: The results of Tukey post test to compare the chemical industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | .764 | .19765 | .74814 | Electronic devices | Chemical |
| The difference is not significant | .999 | .19765 | .45060 | Technical and engineering | Chemical |
| The difference is not significant | .991 | .19765 | .53864 | Oil products | Chemical |
| The difference is not significant | 1.000 | .19765 | -.15013 | Main metals | Chemical |
| The difference is not significant | 1.000 | .19765 | -.02605 | Transportation | Chemical |
| The difference is not significant | .920 | .19765 | .65788 | Non-metal minerals | Chemical |
| The difference is not significant | 1.000 | .19765 | -.36454 | Metal minerals | Chemical |
| The difference is not significant | 1.000 | .19765 | -.07876 | Car | Chemical |
| The difference is not significant | .761 | .19765 | .74921 | Rubber | Chemical |
| The difference is not significant | .998 | .19765 | .47550 | Metal materials | Chemical |
| The difference is not significant | .749 | .19765 | .75454 | Paper materials | Chemical |
| The difference is not significant | .454 | .19765 | .86271 | Wooden materials | Chemical |
| The difference is not significant | 1.000 | .19765 | .11242 | Financial | Chemical |
| The difference is not significant | .593 | .19765 | .81401 | Textile | Chemical |
| The difference is not significant | 1.000 | .19765 | .42662 | Machineries | Chemical |
| The difference is not significant | .229 | .19765 | .95265 | Furniture | Chemical |
| The difference is not significant | 1.000 | .19765 | -.19213 | Contracting | Chemical |
| The difference is not significant | .782 | .19765 | .73999 | Computer | Chemical |
| The difference is not significant | .810 | .19765 | .72671 | Food (except sugar) | Chemical |

1. The comparison of Food (except sugar) industry with other industries: The mean of this industry didn’t have significant difference with other industries.

**Table 25: The results of Tukey post test to compare the Food (except sugar) industry with other industries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Result | Significance level | Standard error | Industries difference (I-J) | Industry (J) | Industry (I) |
| The difference is not significant | 1.000 | .19765 | .02143 | Electronic devices | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | -.27611 | Technical and engineering | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | -.18806 | Oil products | Food (except sugar) |
| The difference is not significant | .415 | .19765 | -.87684 | Main metals | Food (except sugar) |
| The difference is not significant | .753 | .19765 | -.75276 | Transportation | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | -.06882 | Non-metal minerals | Food (except sugar) |
| It is significantly smaller | .047 | .19765 | -1.09125(\*) | Metal minerals | Food (except sugar) |
| The difference is not significant | .616 | .19765 | -.80547 | Car | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | .02250 | Rubber | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | -.25121 | Metal materials | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | .02783 | Paper materials | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | .13601 | Wooden materials | Food (except sugar) |
| The difference is not significant | .960 | .19765 | -.61429 | Financial | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | .08731 | Textile | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | -.30008 | Machineries | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | .22594 | Furniture | Food (except sugar) |
| The difference is not significant | .306 | .19765 | -.91884 | Contracting | Food (except sugar) |
| The difference is not significant | 1.000 | .19765 | .01328 | Computer | Food (except sugar) |
| The difference is not significant | .810 | .19765 | -.72671 | Chemical | Food (except sugar) |

For two by two comparisons of the industries, Tukey post test was applied. Based on the results of the post test, the compared industries were in six groups.

1. Furniture industries and wooden materials significantly were smaller than financial, chemical, transportation, car, main metals, contracting and metal industries and they didn’t have significant difference with textile, paper materials, electronic devices, computer, food except sugar, non-metal minerals, oil products, metal materials, technical and engineering and machineries.
2. Textile, paper materials, rubber, electronic devices, computer and food except sugar industries significantly were smaller than chemical, transportation, car, main metals, contracting and metal minerals industries and they didn’t have significant difference with non-metal minerals, oil products, metal materials, technical and engineering, machineries and financial industries.
3. Non-metal minerals industry significantly was smaller than car, main metals and metal minerals industries and didn’t have significant difference with non-metal minerals, oil products, metal materials, technical and engineering, machineries, financial, chemical and transportation.
4. Oil product industry is significantly smaller than contracting and metal minerals and it didn’t have significant difference with metal materials, technical and engineering, machineries, financial, chemical and transportation.
5. Metal materials, technical and engineering and machineries industries were significantly smaller than metal minerals industry and they didn’t have significant difference with financial, chemical, transportation, car, main metals and contracting industries.
6. Metal minerals industry significantly was higher than furniture, wooden materials, textile, paper materials, rubber, electronic devices, computer, food except sugar, non-metal minerals, oil products, metal materials, technical and engineering and machineries industries and it didn’t have significant difference with financial, chemical, transportation, car, main metals and contracting industries.

**Table 26: The results of the comparison after Tukey test among 20 industries**

|  |  |  |
| --- | --- | --- |
| The classification based on 0.05 level | N | Industry |
| Group 6 | Group 5 | Group 4 | Group 3 | Group 2 | Group 1 |
|  |  |  |  |  | -.0463 | 84 | Furniture |
|  |  |  |  |  | .0437 | 84 | Wooden materials |
|  |  |  |  | .0924 | .0924 | 84 | Textile |
|  |  |  |  | .1518 | .1518 | 84 | Paper materials |
|  |  |  |  | .1572 | .1572 | 84 | Rubber |
|  |  |  |  | .1582 | .1582 | 84 | Electronic devices |
|  |  |  |  | .1664 | .1664 | 84 | Computer |
|  |  |  |  | .1797 | .1797 | 84 | Food (except sugar) |
|  |  |  | .2485 | .2485 | .2485 | 84 | Non-metal minerals |
|  |  | .3677 | .3677 | .3677 | .3677 | 84 | Oil products |
|  | .4309 | .4309 | .4309 | .4309 | .4309 | 84 | Metal materials |
|  | .4558 | .4558 | .4558 | .4558 | .4558 | 84 | Technical and engineering |
|  | .4798 | .4798 | .4798 | .4798 | .4798 | 84 | Machineries |
| .7940 | .7940 | .7940 | .7940 | .7940 |  | 84 | Financial |
| .9064 | .9064 | .9064 | .9064 |  |  | 84 | Chemical |
| .9324 | .9324 | .9324 | .9324 |  |  | 84 | Transportation |
| .9851 | .9851 | .9851 |  |  |  | 84 | Car |
| 1.0565 | 1.0565 | 1.0565 |  |  |  | 84 | Main metals |
| 1.0985 | 1.0985 |  |  |  |  | 84 | Contracting |
| 1.2709 |  |  |  |  |  | 84 | metal minerals |
| .651 | .085 | .062 | .066 | .050 | .458 |  | Significance level |

**Conclusion**

In this study, based on theoretical and conceptual bases, it is assumed that the mean systematic risk of the companies listed in Iran stock market in various industries with each other had significant difference. To review this issue, the systematic risk of 7 years (2004-2010) of 20 industries was extracted annually and was compared.

The results supported the significant difference of the mean of systematic risk among 20 industries and the details of the results were as following: The mean of electronic devices industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries. The mean of technical and engineering industry didn’t have significant difference with other industries. The mean of oil product industry didn’t have significant difference with other industries. The mean of main metals industry didn’t have significant difference with other industries. The mean of transportation industry didn’t have significant difference with other industries. The mean of non-metal minerals industry didn’t have significant difference with other industries. The mean of metal minerals industry significantly was bigger than rubber, textile, computer, furniture and food except sugar industries and it didn’t have significant difference with other industries. The mean of car industry didn’t have significant difference with other industries. The mean of rubber industry didn’t have significant difference with other industries. The mean of metal materials industry didn’t have significant difference with other industries. The mean of paper materials industry significantly was smaller than metal minerals and it didn’t have significant difference with other industries. The mean of wooden materials industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries. The mean of financial industry didn’t have significant difference with other industries. The mean of textile industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries. The mean of machineries industry didn’t have significant difference with other industries. The mean of furniture industry was significantly smaller than metal minerals, contracting and main metals and it didn’t have significant difference with other industries. The mean of contracting industry was significantly bigger than furniture and it didn’t have significant difference with other industries. The mean of computer industry was significantly smaller than metal minerals and it didn’t have significant difference with other industries. The mean of chemical industry didn’t have significant difference with other industries. The mean of food except sugar industry didn’t have significant difference with other industries.

The effect of the type of industry on systematic risk of the commercial units is justified based on various conditions of each of the industries. Furniture industry had the lowest systematic risk and metal minerals industry had the highest systematic risk. This condition seems logical based on the conditions of market and government and parliament policies. The security in furniture industry arising from government policy based on limitation on import shows the low risk of this industry. The global crisis and economical stagnation at international level and reduction of price and products export of metal minerals industry can be the major reasons of high systematic risk in this industry.

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