**Female Directors and Corporation Diversification: Evidences from China**

**ABSTRACT**

More and more female directors are elected as the board member in Chinese public listed corporations. This common phenomenon has impact on different aspects of corporate behaviors. In this paper, we select a sample of public list Chinese companies from 2001 to 2010 to analyze how the female directors influence the corporation’s diversification behavior. The study found that: (1) female directors significantly reduce corporation diversification; (2) after we classify female directors into independent directors and non-independent directors, we found predominantly non-independent female directors significantly reduced corporation diversification; (3) the results of further analysis revealed that women in key positions of directors (including the chairman and chief executive office) have the most significant impact in reducing the diversified of corporation compared with other factors. This paper studies the female directors’ role in corporation’s diversification which help us to better understand how different types of directors have influences on corporation diversification.

**Keywords:** Female Directors; Corporation Diversification, China

**INTRODUCTION**

In thousands of years long Chinese history, women have been more often characterized as a family role in traditional Chinese society and that their social role are always be neglected. After the reform and open door in 1978, women began to play a much more important role in society. With the more participation of women in economic activities, the status of women has gradually been raised. It mandated to established a modern enterprise system, to encourage and include high levels of female managers with Chinese Women's Development Program for 2001-2010 published by Chinese government.  State-owned enterprises should actively recruit women in decision-making process as board of directors, board of supervisors and managers of enterprises. So women managers can play a more powerful role in participation and enhances the corporate leadership. The proportion of women in leadership position. On July 30, 2011, Chinese government issued the Outline of the Development of Chinese Women for 2010-2020 which further required that the proportion of women in the board of directors, the board of supervisors and the management of enterprises to gradually increase during the period from 2010 to 2020.

In 2012 world ‘s richest women list issued by Hurun, the proportion of Chinese women has reached 13%. There were 22 self-made female billionaires with 10 billion net worth in the list which include 11 Chinese women accounting for half of the total number. Hurun who was the founder and chief researcher for Hurun report said that Chinese female entrepreneurs like Chinese table tennis team whose status in the world are the absolute No.1 in the world. China Entrepreneur magazine published its 2010 annual report of female executives from listed companies in China showed that the proportion of listed companies with female directors is about 59.65% in the total number of the listed company. The total number of female independent directors and non-independent directors, respectively, are 718 and 814. Female directors usually prefer low risk, have low overconfidence and show other behavioral characteristics in management (Peng and Wei, 2007) which will have impacts on corporation decision-making and change corporation financial behavior (Martin, Nishikawa and Williams 2009).

  Based on the development of female managers and their impact on corporation behaviors, this paper focuses on Chinese listed companies in Shanghai and Shenzhen stock exchange as a sample to investigate how different types and level of female directors affect the diversification of business. The study found that female directors significantly reduce the business diversification, When the female directors are divided into female independent directors and non-independent directors, the results show that the female independent directors have no significant effect on business diversification while female non-independent directors played the role of reducing diversification of business. Further distinguish the female directors into different levels, the results show that the key female directors which include the chairman and CEO reduced business diversification more significantly than the female directors in non- key positions.

Compared with the previous similar research literature, this paper made contribution in the following three aspects: (1) Although there is a large number of paper revealing the characteristics of decision-making behavior of female directors, but very rare literature examines this phenomena in China, especially women director's impact on diversification of business operation, this paper enriches the economic consequences of female directors and the influencing factors of female directors on business diversification. (2) The evaluation of how independent directors make contribution to business has always attracted the attention from academies and practitioners. Different literature shows significant different conclusions. The results from this study shows that the independent female directors have no significant correlation with business diversification, which helps to scientifically evaluate the functions of female directors in China. (3) most of the previous studies that focused on female directors ignored the female directors with different types and different position levels. This paper divides female directors into independent female directors and non-independent directors as well as female non-key positions and female directors with key positions which expanded the domain of female directors in the relevant literature.

The rest paper is arranged as follows: the second part is the literature review, theoretical analysis and research hypothesis, the third part is the sample selection and research model, the fourth part is the empirical analysis and results, and finally a conclusion and discussions.

**LITERATURE REVIEW**

**Female Directors**

 The influence of female directors on the different behaviors of the company has been a problem widely studied by academics in recent years. This study has two main streams. The first stream focuses on the risk-aversion of female directors showed in the financial decision-making process, and second stream focuses on how female directors can improve corporate governance functions of corporation. In different studies, some of the literature may further widen female director due to the differences of the analysis objects. Some studies extended the study from the female directors to female executives, including board of directors, board of supervisor and other senior executives, while some studies only focus on executive members such as CEO or CFO and some senior executive members.

The literature on the first main stream of research includes: Levi and Li (2008) found that smaller the premium for the target company with higher proportion of female directors during mergers and acquisitions. Research by Srinidhi et al. (2011) and Gavious et al.(2012) shows that earnings management is significantly lower when companies own female directors. The findings of Li Xiaorong and Liu Xing (2012) revealed that women CEOs reduce the risk of a share price crash. Du Xingqiang et al (2012) found that female executives are more compassionate, which significantly enhances the amount of corporate donations.

The literature surrounding the second stream of research includes: Studies by Gul et al.(2008) revealed that cost of capital for company will significant decrease with the increase of the proportion of female directors.  The authors concluded that the findings of this study because female directors have improved corporate governance and become risk aversion. This result is consistent with the conclusions from other studies. Adams and Ferreira (2009) found that female directors attended the meeting more regularly than male directors with higher probability of female directors joining specialized oversight committees (such as audit committees, nomination committees and compensation committees) which increase the performance and equity incentive compensation ratio to board of directors. The improvement of corporate governance will undoubtedly improve the quality of accounting information and increase dividend payment which protects the interests of small and medium-sized investors, Gul et al. [14] study showed that female directors significantly improve the information content of share price. Byoun et al. (2011) found that female directors are more inclined to pay dividends and dividend payout rate is higher.

**Corporation Diversification**

 Analysis of the influencing factors of diversification of business has become an important issue in the process of business development. Many academic researches focus on how different factors can influence the diversification of company’s business.

 The early literature, for example Montgomery (1994) and other scholars focused on market power theory and resource-based theory as the theoretical basis to explain the diversification of corporations. Market power theory argues that corporations diversify to gain market power and gaining a competitive advantage through horizontal subsidies and reciprocal exchanges to occupy the market. The resource based theory helps corporations to diversify to make full use of specialized assets or resources to gain competitive advantage over competitors.

In recent years, the principal-agent theory gradually become the mainstream research in corporation diversification which focuses on management team. Ownership structure is an important mechanism to solve the principal-agent problem. The relationship between ownership structure and corporation diversification has become the concern to many studies. Denis et al. [18] based on the theory of agency costs, found that corporation diversification is significantly negatively related to the proportion of share held by the management and the external majority shareholders. In addition, their further analysis revealed that the external control threats, financial distress and the frequency of change of management have reduced corporation diversification. Amihud and Lev (1999) further found that the concentration of share will significantly reduce the degree of corporation diversification. Good corporate governance can reduce the agency costs to a certain extent, which can reduce the diversification caused by the business Loss of shareholder value.  Jiraporn et al. (2006) showed that there is a significant negative correlation between the protection of shareholders' rights and the degree of corporation diversification. Further empirical evidence shows that there is higher discount for the value of corporation which has more limitation of shareholders' rights with more constrained corporate governance. Kim et al. (2009) examined the duality of chairperson and CEO on corporation diversification and found the same chairperson and CEO is significantly lead to irrelevant corporation diversification. But the board of directors, institutional investors and other corporation governance mechanism significantly weakens this positive correlation relationship.

**THEORETICAL ANALYSIS AND HYPOTHESIS**

Hambrick and Mason (1984) proposed executive ladder theory and argued that the value s​and other cognitive factors from senior executives which include gender, education and age, etc. will have a significant influence on the corporation behaviors. Regarding to the relationship between female directors and corporation diversification, we can focus on the two dimensions risk aversion and corporate governance to examine this relationship.

(1) risk aversion dimension. In the process of rapid expansion of corporations, choosing to diversify has become an important way for corporation to develop. But it is crucial for corporation to choose a right strategy for corporation diversification because almost all the declines and crises of corporation are related to the process of corporation diversification. Facts show that corporation diversification post a huge risk. Diversification of listed companies will bring huge uncertainty even high risk to corporation and its stakeholders (Zhang and Huang,2009). Relevant empirical evidence shows that diversified investment decreases corporate value (Lang, et al, 1994, Liu, 2009), which also supports from other studies that showed a diversified investment may increase the business risk of the company. There have been numerous studies have shown that female investors are more cautious (Powell, 1997). Women show lower risk appetite when making financial decisions (Powell, 1997). Women are more conservative in investment and they invest less in risk assets (Huang and Kisgen,2013). Corporation diversification will bring more uncertainty, increase the business risks significantly. It is argued that female directors on board will not tend to diversify their businesses because they are more risk averse.

  (2) Corporate governance dimension. Women directors involved in corporate decision-making will bring diversity with new perspective different from male directors to improve the quality of discussions at the meeting (Gul, Srinidhi, Ng,2011). Female directors will devote more time and energy to supervise the behaviors of managers (Adams, Ferreira, 2009). Female directors will use their unique advantages of human capital to build more easily accepted business practices to stakeholders (Terjesen, Seal, Singh, 2009). Female directors will reduce the agency problem when they participate in management (Jurkus, Park, Woodard, 2011). Therefore female directors will inevitably enhance the quality of corporate governance in certain degree. Corporation diversification sometimes is the way that managers use to pursuit of their own interests and an important way to build their empire by exacerbating the problem of agency costs (Goetx, Laeven, Levine 2013). Therefore, female directors can improve corporate governance and reduce the corporation diversification caused by agency issues.

Following the above discussions, we think the risk averse of female directors and the improvement of corporate governance will reduce the corporation diversification.  Based on this, we propose the following hypothesis 1.

*H1 : Female directors are significantly negatively related to corporation diversification.*

 In China, the directors can be categorized as independent directors and non-independent directors. There are obvious differences between these two types of directors because of the importance and role of the two different types of directors in corporate decision-making.  The evidences from Chinese stock market show that independent directors act as rubber stamp in most Chinese listed company because the reputation of independent directors fails to work (Du and Zhu, 2009) and the appointment of independent directors is controlled by company. It is argued that the participation of independent directors in the management is low. So it is difficult for the independent directors to play an effective role in corporation governance. There is no significant correlation relationship between the proportion of independent directors and corporation performance (Hermalin and Weisbach, 1991, Bhagat and Black, 2002).

Non-independent directors are often the senior members of top management team which participate directly in management and have more information to help them to have more voices in business operation. Xue You-zhi et al [40] found that the higher ratio or number of the executive directors and the higher concentration of share executive directors can significantly reduce corporation diversification. According to the above reasoning, it is difficult for independent female directors to have a significant impact on corporation diversification. While non-independent female directors can fully use their own power and influence in business operation, they not only can play an important role in decision making with preference for risk-averse but also improve the corporate governance. These two factors can help to reduce corporation diversification. Based on the above analysis, we propose hypotheses 2.

*H2a: Independent female directors have no significant effect on corporation diversification.*

*H2b: Non-independent female directors are significantly negatively related to corporation diversification.*

For each company, there is a large difference in the roles played by directors at different positions. Fiegener noted that directors in different positions have different power, for example, key positions such as chairman and CEO play a much more important role (Fiegener,2010). In China, corporation law or corporation constitution give chairperson of the board the right to convene and preside the board meeting. The chairperson of board can appoint or dismiss the board members and manager etc. CEO also has power to hire, dismiss the key managers in company. Therefore, the leadership style of the directors in key positions such as chairperson and CEO position will affect the decision-making and other aspects of corporation (Gu, Weng, Xie, 2012). When female directors in key positions to run business, they will make more risk averse decision. They also can help to improve corporate governance. Two impacts can help non-independent female directors in key positions will be less likely to adopt strategy to diversify. In addition, there is a closer alignment between the interests of female directors in key positions and interests of corporation which will further reduce the uncertainty and risk associated with corporation diversification to protect their own interests( Miller and Lester, 2011). So it is a reasonable choice for female non-independent director to reduce the degree of diversification. So we propose the following hypothesis 3.

*H3 : Compared to other types of directors, female directors in key positions reduce corporation diversification more significantly*

**SAMPLE SELECTION AND RESEARCH MODLE**

**The Sample Selection**

This paper selects all the listed companies in Shanghai and Shenzhen stock markets in China's capital market from 2001 to 2010 as the sample. And with reference to research practice, sample screening in accordance with the following sequence: (1)excluding in the financial insurance industry ( CSRC industry Code I) listed companies; (2) excluding the comapies with simultaneous listing of B / H / N shares in different stock markets; (3) excluding ST , \* ST and other special treated listed companies; (4) excluding insolvent type companies with debt to assets ratio greater than 1; (5) excluding missing data companies; we finally had 10704 observations in our sample, in order to reduce the possible impact of extreme values, we used *winsorize* treatment. In terms of data sources, female director data are compiled from the executive resume data in the CSMAR database and the rest are from CCER China Economic and Financial Index database.

Table 1 reports the distribution of female directors. The average number of female directors ( *FEN* ) and the proportion of female directors ( *FER* ) increase year by year, the average number of female directors in each listed company is about 1.1 and the percentage of female directors is 10.85% respectively. In 2001 China Securities Regulatory Commission issued the guideline to require listed companies to include more independent directors in the board of directors. So in 2002, the number of female independent directors (*FEIN* ) and the proportion of female independent directors (*FEIR* ) have a substantial growth, both increasing more than  5 times. The number of female non-independent *(FEEN)* directors and proportion *(FEER)* essentially changed very little since 2001 with an average of 0.7262 and 7.16% respectively. The number of female directors in key positions *(FENK)* is about 0.0879 which indicates that between 2001 and 2010 listed public the proportion of female directors in key position such as chairperson or CEO is low.

[ Insert Table 1 here ]

**Research Model**

  To test Hypothesis 1, with the reference to the studies by Denis et al.(1997), chen Xinyuan and Huang Jun (2007) , Zhang Min and Huang Jicheng (2009). We construct the research model as following model (1):

*DIV=**α0+* *α 1FE+* *α 2LEV+* *α 3SIZE+* *α 4AGE+* *α 5MOLD+ΣINDUS+ΣYEAR+ε* (1)

In the model (1), *DIV* represents corporation diversification, draw lessons from the research of Jiang Fuxiu (2006) with two dimensions of income diversification measure. Among them, the diversification of business *N* is equal to the listed company's main business income involved the number of industries, income diversification *EI* is equal to ΣPi \*ln(1/P i ), Pi represents the i- industry revenue as a share of total revenue. *The* larger *N* and *EI* indicate the diversification of business is higher. *FE* represents female directors variables. In order to make the study more robust, this paper selects female directors number of high and low dummy using variable *FED*, the number of females using variable *FEN* and the proportion of the females on boards using variable *FER*. In addition, model (1) used control variables such as financial leverage *LEV*, company size *SIZE,*age of listed companies *AGE* , average age of directors *MOLD* , industry dummy variable *INDUS* and annual dummy variable *YEAR*, refer to the table 2 for the definition of specific variables.

[ Insert Table 2 here ]

In order to test hypothesis 2, we used model (2). In model (2) female directors were divided into female independent directors and female non-independent:

 *DIV=α0+* *α 1FEI+* *α 2FEE+* *α 3LEV +α 4SIZE+* *α 5AGE+* *α 6MOLD+ΣINDUS+ΣYEAR+ε* (2)

In model (2), *FEI* and *FEE* represent female independent directors and female non-independent directors with three different measurements using the number of high and low dummy variables, the number of females and the proportion of female directors.

  In order to test the hypothesis 3, we used the following model (3) which include female directors in non-key positions *FENN* (including *FENI* representing an independent female director and *FENE representing* a female non-independent director in non-key position and female director in key positions *FENK* two different levels:

 *DIV=α0+* *α 1FENN+* *α 2FENK+* *α 3LEV +α 4SIZE+* *α 5AGE+* *α 6MOLD+ΣINDUS+ΣYEAR+ε*    (3)

**EMPIRICAL ANALYSIS AND RESULTS**

**Descriptive Statistics**

Table 3 reports the descriptive statistics of the main variables in this article.

[ Insert Table 3 here ]

  (1) Dependent variables: The average of *N* is 4.2282 which indicates that the main business of listed companies on average involving more than 4 industries. The maximum number is 29. In addition, variables *EI* with the maximum and the minimum values ​​were 2.7138 and -1.3586 respectively which indicate a significant difference in the degree of diversification among different companies. The average and median are above 0.70 reflecting the high degree of diversification of the listed companies in China.

(2) The main independent variables, *FED*, *FEID* and *FEED* with the average value are less than 0.50. The average value of *FEN* is 1.1000 with the standard deviation 1.0632 which reveals the large fluctuation of the number of female directors, the female independent directors, female non-independent directors. In addition, the median of *FEN* indicates at least 25% of listed companies have no female directors.

(3) Descriptive statistics of control variables are as follows: *LEV* shows that the financial leverage of listed companies is higher with average of 0.4705. The mean and standard deviation are equal to 21.4660 and 1.1018 for *SIZE* variable reflecting a smaller company size fluctuations. *AGE* variable for sample company is about 7 years, *MOLD* is equal to 48.1226 which shows the average age of listed company directors is younger less than 50 years old.

 **Correlation Analysis**

Table 4 reports Pearson correlation analysis results among the major variables involved in the model presented in this paper. From table 4, we can see that either *N* or *EI* is significant negatively correlate with *FED*, *FEN*, *FER* in 1% significant level. The results indicate that female directors can significantly reduce the corporation diversification. Hypothesis 1 has been supported by correlation analysis but need more analysis. The correlation coefficients between the other test variables in the other models were all less than 0.40 which indicate there is no serious multicollinearity.

 [ Insert Table 4 here ]

  **Female Directors and Corporation Diversification**

Table 5 reports results from OLS regression to show the relationship between female directors and corporation diversification. All regression results are adjusted by White method to reduce the possible impact of different in variance. As shown in Panel A, column (1), *FED* is significantly negatively correlated with N (coefficient = -0.0982, T Value = -1.9666, 1% significant level), indicating that when there are more female directors in the board of directors can significantly reduce the corporation diversification. Further, the regression results in columns (2) and (3) show that *FEN,* *FER* are significantly negatively correlated with *N* (coefficient = -0.0371, T Value = -1.7189, 10% significant level and coefficient = -0.4697, T Value = -2.1466, 5% significant level). The significant negative correlation relationship indicates that the more female directors and the higher the proportion of female directors correlates with lower degree of corporation diversification.

 In Panel B columns (4), (5) and (6), *FED,* *FEN,* *FER* are negatively correlated with *EI* at 5% significant level with coefficient = -0.0227 , T value = -2.2855, at 10% significant level with coefficient = -0.0080, T = -1.8410 value and at 5% significant level with coefficient = -0.1058, T = -2.4289 value. These above results jointly support the hypothesis 1. In terms of control variables, columns (1) to (6) in Table 5 are basically the same.

[ Insert Table 5 here ]

  Table 6 reports results from OLS regression to show the relationship between female directors and corporation diversification. As shown in Panel A, column (1), *FEID* is positively correlated with N but not significant (coefficient = 0.0811, T value = 1.5600), indicating that female independent directors have no significant effects on corporation diversification. But the results show that *FEED*is significantly negatively correlated with N (coefficient = -0.1679, T value = -2.8382, 1% significant level) which indicates that female non-independent directors significantly reduced the level of corporation diversification. These results support hypothesis H2a and H2b.

From panel A, column (2) the results show *FEIN*is positively correlated to *N* but not significantly (coefficient = 0.0357, T value = 0.8758). It can see *FEEN*is significantly negatively correlated with *N* (coefficient = -0.0705, T value = -2.7403, 1% significant level). From panel A column (3), the results reveal that *FEIR*is positively correlated to N but not significantly (coefficient. 0.2689, T value = .6714), *FEER*is significantly negatively correlated with N (coefficient = -0.8229, T value = -3.1617, 1% significant level). From panel B column (4) show *FEID*is positively correlated to *EI* but not significantly (coefficient = 0.0103, T value =1.0302), *FEED*is significantly negatively correlated with *EI*at 5% significant level (coefficient = -0.0247, T value = -2.0758). From panel B column (5), it can see that *FEIN*is positively correlated to *EI* but not significantly (coefficient = 0.0015, T value = 0.1911), *FEEN*is significantly negatively correlated with *EI*at 5% significant level (coefficient = -0.0123, T value = -2.3381). From panel B column (6), *FEIR*is positively correlated to *EI* but not significantly (coefficient =0.0046, T value = 0.0596) , *FEER*is significantly negatively correlated with *EI*at 1% significant level (coefficient = -0.1586 , T value = -2.9892). All the results support that female independent directors have no significant effects on corporation diversification while female non-independent directors can significantly reduce corporation diversification. Therefore the above analyses support the hypothesis H2a and H2b.

[ Insert Table 6 here ]

  Table 7 shows the multiple variables regression results for different levels of female director and corporation diversification. Column (1) and (2) are used to compare the differences between *FENN* and *FENK*. Column (3) and (4) compare the differences between *FENE* and *FENK.* Column (5) and (6) compare the differences between *FENI, FENE* and *FENK*.

The *FENK* row from column (1) to (6), *FENK*is 1% significantly negatively correlated with N and EI. The column (1) shows the different effects between *FENK*and *FENN* with coefficient equal to -0.2096 and Wald test F value = 8.7910, P value = 0.0030. The column (2) shows the different effects between *FENK*and *FENN*with coefficient equal to -0.0481 and Wald test with F value = 11.3330, P value = 0.0008. The column (3) also shows the different effects between *FENK*and *FENE* with coefficient equal to -0.1835 and Wald test F value = 6.4647, P value = 0.0110.

Column (4) shows the different effects between *FENK*and *FENE* with coefficient equal to -0.0453 and Wald test F value = 9.6488, P value = 0.0019. Column (5) shows the different effects between *FENK*and *FENE*with coefficient equal to 0.1837 and Wald test F value =6.4839, P value =0.0109. Column (6) shows the different effects between *FENK*and *FENI*with coefficient equal to 0.2681 and Wald test F value = 11.3288, P value = 0.0008. *FENK*is also different from *FENE*with coefficient equal to -0.0453 and Wald test F value = 9.6523, P value = 0.0019. *FENK* is different from *FENI*with coefficient equal to -0.0507 and Wald test F value =11.4263, P value = 0.0007. All the results show the influence from FENK is different from other types of directors. All of the above results support that female directors in key positions reduce the degree of corporation diversification is more significant than other types of female directors. Therefore hypothesis 3 is supported.

[ Insert Table 7 here ]

**CONCLUSIONS AND DISCUSSIONS**

With the rapid development of global economy, corporation diversified will getting more popular especially for the corporation from emerging economies. How to choose right strategy for corporation diversification and how different factors influence this process have become an important issue which attract a lot of attention from academia and practitioners. Previous studies mostly focus on perspectives from corporate structure, market power, resource utility, etc. This paper extends the perspective from corporate governance view. This paper focuses on the decision-making process from top management especially how female directors can play a role in the process of corporation diversification. From this unique starting point, we conducted an empirical study of female directors with two dimensions risk aversion and better corporate governance. The topic is how these two dimensions from female directors can influence corporation diversification. Findings reveal that female directors significantly reduce corporation. further empirical evidence has shown that female independent directors have no significant effects on corporation diversification but female non-independent directors can significantly inhibit corporation diversification. Furthermore, when female directors are divided into two categories as key position director and non-key position directors, it shows that female directors in key positions significantly reduce corporation diversification.

 The results from this paper have some policy implications: This article is mainly focusing in the context of Chinese companies and their motivation to diversification. It provides a new interpretation to show that director and their decision-making style will impact on corporation diversification. Therefore it can provide to design a better management team to guide corporation diversification from a theoretical perspective. Companies can reduce the risks associated with corporation diversification by having certain percentage of female directors on board. When companies want to take high risk and expand rapidly, it is proper to reduce the proportion of female directors. In addition, this study contributes to the positive role of female directors on corporate governance. When companies train more female managers and let them participate in the relevant decision-making, companies can help to improve diversify and improve the quality of corporate governance. This can help improve status of women and follow the government regulation. Also companies can benefit from more female directors who play roles in key positions.

This study has some limitations need to address. The topic is limited at one country context. The focus of this paper is the relationship between female directors and corporation diversification in China. Future research can be considered to expand in the following two aspects: (1) there are other characteristics associated with female directors can impact on corporation diversification. In addition to gender, the education level, age, experience can influence on female directors’ decision on corporation diversification; (2) it is argued that female directors will reduce the corporation diversification with other motives such as economic incentive. These two areas will be some important directions for future research.

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|  |  |
| --- | --- |
|  | Table1 Distribution of female directors |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |   | 2007 | 2008 | 2009 | 2010 | overall |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FEN | 0.9784 | 1.0380 | 1.0427 | 1.0852 | 1.0556 | 1.0481 |   | 1.0919 | 1.1364 | 1.1533 | 1.2208 | 1.1000 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FEIN | 0.0446 | 0.2456 | 0.3440 | 0.3754 | 0.3753 | 0.3917 |   | 0.4027 | 0.4260 | 0.4464 | 0.4691 | 0.3738 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FEEN | 0.9338 | 0.7924 | 0.6987 | 0.7098 | 0.6803 | 0.6565 |   | 0.6892 | 0.7105 | 0.7068 | 0.7517 | 0.7262 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FER | 0.0982 | 0.0978 | 0.0979 | 0.1030 | 0.1030 | 0.1030 |   | 0.1080 | 0.1113 | 0.116 | 0.1266 | 0.1085 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FEIR | 0.0040 | 0.0234 | 0.0327 | 0.0359 | 0.0371 | 0.0385 |   | 0.0397 | 0.0413 | 0.0446 | 0.0490 | 0.0370 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FEER | 0.0941 | 0.0744 | 0.0653 | 0.0671 | 0.0659 | 0.0646 |   | 0.0683 | 0.0699 | 0.0713 | 0.0776 | 0.0716 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FENN | 0.8959 | 0.9456 | 0.9668 | 1.0095 | 0.9811 | 0.9778 |   | 1.0058 | 1.0491 | 1.0603 | 1.1241 | 1.0154 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FENE | 0.8527 | 0.7051 | 0.6263 | 0.6372 | 0.6101 | 0.5870 |   | 0.6040 | 0.6248 | 0.6161 | 0.6569 | 0.6439 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FENK | 0.0824 | 0.0937 | 0.0819 | 0.0799 | 0.0786 | 0.0731 |   | 0.0886 | 0.0915 | 0.0960 | 0.1011 | 0.0879 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Note : *FEN* *,* *FEIN* *,* *FEEN* Representing the number of female directors, the number of female independent directors, the number of female non-independent directors, *FER,* *FEIR,* *FEER* representing the proportion of female directors, female independent directors, female non-independent directors, *FENN* *,FENE* *,* *FENK* representing the number of female non-key directors, number of non-key female non-independent directors and number of female key positions in the board of directors.

|  |  |  |  |
| --- | --- | --- | --- |
|   |   | Table 2 variable definitions |   |
|   |   |   |   |   |   |   |   |
|   |   | Variable nature | Variable code | Variable name | Variable definitions |   |
|   |   |   |   |   |   |   |   |
|   |   | Dependent variables | N | Business diversification | The main business income of listed companies involved in the number of industries |   |
|   |   |   |   |   |   |   |
| EI | Income diversification | Is equal to ΣPi \*ln(1/P i ), Pi represents the i- industry revenue as a share of total revenue |   |
|   |   |   |   |
|   |   |   | FE | Female director | Is measured by low or high dummy(FED), the number of people(FEN) and proportion of females(FER) |   |
|   |   |   |   |   |   |   |   |
|   |   | Independent variables | FEI | Independent female director | Using low or high dummy (FEID), the number of people (FEIN) and the proportion of female (FEIR)  |   |
|   |   |   |   |   |   |   |   |
|   |   |   | FEE | Female non-independent director | Using measures of low or high dummy (FEED), number of people(FEEN) and proportion of females (FEER) |   |
|   |   |   |   |   |   |   |   |
|   | LEV | Financial leverage | Equal to total liabilities at the end of the year / total assets at the end of the year |   |
|   |   |   |   |   |
|   | SIZE | Company Size | The size of the company is equal to the natural logarithm of the total assets at the end of the year |   |
|   |   |   |   |   |
| Control variables | AGE | Listing years | The time to market is equal to the difference between the research year and the listed year |   |
|   |   |   |   |
| MOLD | The average age of the directors | Equal to the average age of all directors |   |
|   |   |   |   |   |   |
|   | INDUS | Industry dummy variables | Involved12 | Industry ( see CSRC standard ) , set 11 dummy variables |   |
|   |   |   |   |   |   |
|   | YEAR | Annual dummy variable | Involved10 | A natural year, set 9 dummy variables |   |

|  |  |
| --- | --- |
|    Table3 Descriptive statistics of major variables  |   |
|   |
| variable | Observations | average value | Standard deviation | Minimum | 25% points | median | 75% points |  Maximum |  |    |
| N | 10704  | 4.2282  | 2.4617  |   | 1.0000  | 3.0000  | 4.0000  | 5.0000  | 29.0000  |   |
|   |   |  |
| EI | 10704 | 0.7307 | 0.5015 | -1.3586 | 0.3217 | 0.7136 | 1.0919 | 2.7138 |  |
|   |   |   |   |   |   |   |   |   |   |
| FED  | 10704  | 0.3019  | 0.4591  | 0.0000  | 0.0000  | 0.0000  | 1.0000  | 1.0000  |   |
|   |
| FEID | 10704 | 0.3228 | 0.4676 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FEED | 10704 | 0.1700 | 0.3757 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FEN | 10704 | 1.1000 | 1.0632 | 0.0000 | 0.0000 | 1.0000 | 2.0000 | 7.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FEIN | 10704 | 0.3738 | 0.5841 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 4.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FEEN | 10704 | 0.7262 | 0.8779 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | 7.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FER | 10704 | 0.1085 | 0.1055 | 0.0000 | 0.0000 | 0.1000 | 0.1667 | 0.6667 |   |
|   |   |   |   |   |   |   |   |   |   |
| FEIR | 10704 | 0.0370 | 0.0589 | 0.0000 | 0.0000 | 0.0000 | 0.0833 | 0.4000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FEER | 10704 | 0.0716 | 0.0865 | 0.0000 | 0.0000 | 0.0625 | 0.1111 | 0.6364 |   |
|   |   |   |   |   |   |   |   |   |   |
| FENN | 10704 | 1.0154 | 1.0184 | 0.0000 | 0.0000 | 1.0000 | 2.0000 | 7.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FENE | 10704 | 0.6440 | 0.8250 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 7.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| FENK | 10704 | 0.0879 | 0.3139 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| LEV | 10704 | 0.4705 | 0.1884 | 0.0091 | 0.3363 | 0.4820 | 0.6135 | 0.9970 |   |
|   |   |   |   |   |   |   |   |   |   |
| SIZE | 10704 | 21.4660 | 1.1018 | 18.1572 | 20.7150 | 21.3156 | 22.0525 | 28.1356 |   |
|   |   |   |   |   |   |   |   |   |   |
| AGE | 10704 | 7.0646 | 4.5057 | 0.0000 | 3.0000 | 7.0000 | 10.0000 | 20.0000 |   |
|   |   |   |   |   |   |   |   |   |   |
| MOLD | 10704 | 48.1226 | 3.8234 | 34.6667 | 45.5000 | 48.1000 | 50.7000 | 60.7778 |   |
|   |   |   |   |   |   |   |   |   |   |

|  |
| --- |
|  Table4 Pearson correlation analysis of main variables |
|   | variable | N | EI | FED | FEID | FEED | FEN | FEIN |   | FEEN | FER | FEIR | FEER | FENN | FENE | FENK | LEV | SIZE | AGE | MOLD |
|   | N | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | EI | 0.7266 \*\*\* | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | FED | 0.0293 \*\*\* | 0.0323 \*\*\* | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | FEID | 0.0187 \* | 0.0196 \*\* | 0.4264 \*\*\* | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | FEED | 0.0389 \*\*\* | 0.0388 \*\*\* | 0.6882 \*\*\* | 0.0125 | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | FEN | 0.0261 \*\*\* | 0.0287 \*\*\* | 0.8349 \*\*\* | 0.5202 \*\*\* | 0.6781 \*\*\* | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | FEIN | 0.0117 | 0.0127 | 0.4742 \*\*\* | 0.9270 \*\*\* | 0.0199 \*\* | 0.5643 \*\*\* | 1 |   |   |   |   |   |   |   |   |   |   |   |   |
|   | FEEN | 0.0394 \*\*\* | 0.0432 \*\*\* | 0.6957 \*\*\* | 0.0132 | 0.8081 \*\*\* | 0.8356 \*\*\* | 0.0181 \* |   | 1 |   |   |   |   |   |   |   |   |   |   |
|   | FER | 0.0323 \*\*\* | 0.0327 \*\*\* | 0.7999 \*\*\* | 0.5113 \*\*\* | 0.6338 \*\*\* | 0.9535 \*\*\* | 0.5455 \*\*\* |   | 0.7919 \*\*\* | 1 |   |   |   |   |   |   |   |   |   |
|   | FEIR | 0.0086 | 0.0123 | 0.4529 \*\*\* | 0.9098 \*\*\* | 0.0055 | 0.5355 \*\*\* | 0.9683 \*\*\* |   | 0.0043 | 0.5726 \*\*\* | 1 |   |   |   |   |   |   |   |   |
|   | FEER | 0.0452 \*\*\* | 0.0482 \*\*\* | 0.6674 \*\*\* | 0.0045 | 0.7693 \*\*\* | 0.7985 \*\*\* | 0.0064 |   | 0.9629 \*\*\* | 0.8299 \*\*\* | 0.0179 \* | 1 |   |   |   |   |   |   |   |
|   | FENN | 0.0169 \* | 0.0170 \* | 0.8007 \*\*\* | 0.5386 \*\*\* | 0.6222 \*\*\* | 0.9586 \*\*\* | 0.5820 \*\*\* |   | 0.7738 \*\*\* | 0.9032 \*\*\* | 0.5491 \*\*\* | 0.7279 \*\*\* | 1 |   |   |   |   |   |   |
|   | FENE | 0.0295 \*\*\* | 0.0305 \*\*\* | 0.6549 \*\*\* | 0.0126 | 0.7528 \*\*\* | 0.7853 \*\*\* | 0.0139 |   | 0.9418 \*\*\* | 0.7307 \*\*\* | -0.0039 | 0.8938 \*\*\* | 0.8198 \*\*\* | 1 |   |   |   |   |   |
|   | FENK | 0.0319 \*\*\* | 0.0407 \*\*\* | 0.2230 \*\*\* | 0.0072 | 0.2734 \*\*\* | 0.2721 \*\*\* | 0.0165 \* |   | 0.3187 \*\*\* | 0.2961 \*\*\* | 0.0257 \*\*\* | 0.3436 \*\*\* | -0.0080 | -0.0083 | 1 |   |   |   |   |
|   | LEV | 0.0752 \*\*\* | -0.0042 | -0.0161 \* | 0.0197 \*\* | -0.0168 \* | -0.0087 | 0.0105 |   | -0.0175 \* | -0.0314 \*\*\* | -0.0054 | -0.0346 \*\*\* | -0.0054 | -0.0141 | -0.0122 | 1 |   |   |   |
|   | SIZE | 0.0876 \*\*\* | 0.0093 | -0.0562 \*\*\* | -0.0146 | -0.0614 \*\*\* | -0.0768 \*\*\* | -0.0043 |   | -0.0902 \*\*\* | -0.1177 \*\*\* | -0.0344 \*\*\* | -0.1201 \*\*\* | -0.0671 \*\*\* | -0.0802 \*\*\* | -0.0436 \*\*\* | 0.3297 \*\*\* | 1 |   |   |
|   | AGE | 0.0428 \*\*\* | 0.0614 \*\*\* | 0.0343 \*\*\* | 0.0446 \*\*\* | 0.0141 | 0.0417 \*\*\* | 0.0471 \*\*\* |   | 0.0192 \*\* | 0.0408 \*\*\* | 0.0464 \*\*\* | 0.0182 \* | 0.0422 \*\*\* | 0.0180 \* | -0.0017 | 0.2898 \*\*\* | 0.2320 \*\*\* | 1 |   |
|   | MOLD | 0.0255 \*\*\* | 0.0182 \* | -0.0522 \*\*\* | -0.0051 | -0.0617 \*\*\* | -0.0724 \*\*\* | -0.0057 |   | -0.0839 \*\*\* | -0.0942 \*\*\* | -0.0208 \*\* | -0.1007 \*\*\* | -0.0632 \*\*\* | -0.0756 \*\*\* | -0.0390 \*\*\* | 0.0311 \*\*\* | 0.3425 \*\*\* | 0.1410 \*\*\* | 1 |

Note : \* , \*\* , \*\*\* , respectively 10% , 5% and 1% level significant ( two-tailed )

|  |  |  |
| --- | --- | --- |
|  | Table5 Female Directors and Business Diversification |   |
|   |  | variable | Panel A : Diversification of female directors and businesses | Panel B : Female Directors and Income Diversity |   |
|   |  | (1) | (2) | (3) | (4) | (5) | (6) |   |
|   |  |   |   |
|   |  | Intercept term | 1.6597 \*\*\* | 1.6841 \*\*\* | 1.7730 \*\*\* | 0.9148 \*\*\* | 0.9183 \*\*\* | 0.9397 \*\*\* |   |
|   |  | (2.9315) | (2.9520) | (3.0850) | (8.2019) | (8.1973) | (8.3299) |   |
|   |  |   |   |
|   |  | FED | -0.0982 \*\* | - | - | -0.0227 \*\* | - | - |   |
|   |  | (-1.9666) | (-2.2855) |   |
|   |  |   |   |   |   |   |   |
|   |  | FEN | - | -0.0371 \* | - | - | -0.0080 \* | - |   |
|   |  | (-1.7189) | (-1.8410) |   |
|   |  |   |   |   |   |   |   |
|   |  | FER | - | - | -0.4697 \*\* | - | - | -0.1058 \*\* |   |
|   |  | (-2.1466) | (-2.4289) |   |
|   |  |   |   |   |   |   |   |
|   |  | LEV | 1.0866 \*\*\* | 1.0892 \*\*\* | 1.0856 \*\*\* | 0.1130 \*\*\* | 0.1136 \*\*\* | 0.1128 \*\*\* |   |
|   |  | (8.3699) | (8.3859) | (8.3579) | (4.0624) | (4.0847) | (4.0530) |   |
|   |  |   |   |
|   |  | SIZE | 0.2195 \*\*\* | 0.2191 \*\*\* | 0.2167 \*\*\* | 0.0083 | 0.0083 | 0.0077 |   |
|   |  | (8.5288) | (8.4890) | (8.3679) | (1.6304) | (1.6203) | (1.5042) |   |
|   |  |   |   |
|   |  | AGE | -0.0481 \*\*\* | -0.0481 \*\*\* | -0.0480 \*\*\* | -0.0106 \*\*\* | -0.0106 \*\*\* | -0.0106 \*\*\* |   |
|   |  | (-8.3723) | (-8.3680) | (-8.3579) | (-9.0114) | (-9.0065) | (-8.9945) |   |
|   |  |   |   |
|   |  | MOLD | -0.0053 | -0.0054 | -0.0058 | -0.0002 | -0.0002 | -0.0003 |   |
|   |  | (-0.7550) | (-0.7662) | (-0.8218) | (-0.1174) | (-0.1230) | (-0.1917) |   |
|   |  |   |   |
|   |  | YEAR / INDUS | control | control | control | control | control | control |   |
|   |  | Obs | 10704 | 10704 | 10704 | 10704 | 10704 | 10704 |   |
|   |  | Adj R 2 | 0.0618 | 0.0617 | 0.0618 | 0.0962 | 0.0960 | 0.0962 |   |
|   |  | F value | 29.1851 \*\*\* | 29.1465 \*\*\* | 29.2119 \*\*\* | 46.5492 \*\*\* | 46.4738 \*\*\* | 46.5740 \*\*\* |   |

Note: \*, \*\*, \*\*\* represent of 10%, 5% and 1% levels of significant (two-tailed)

|  |  |  |  |
| --- | --- | --- | --- |
|   | Table 6 Female directors and the type of business diversification |   |   |
|   |  | A Panel : Women Directors and business diversification | B Panel : Women Directors and income diversification |   |
|   | (1) | (2) |   | (3) | (4) | (5) | (6) |   |
|   |  variable |   |   |
|   | Intercept | 1.5925 \*\*\* | 1.6885 \*\*\* | 1.7718 \*\*\* | 0.8974 \*\*\* | 0.9189 \*\*\* | 0.9395 \*\*\* |   |
|   | (2.7865) | (2.9607) |   | (3.0824) | (8.0301) | (8.2012) | (8.3264) |   |
|   |   |   |   |
|   | FEID | .0811 |  |   |  | 0.0103 |  |  |   |
|   | (1.5600) |   | (1.0302) |   |
|   |   |   |   |   |   |   |   |
|   | FEED | -0.1679 \*\*\* | - |   | - | -0.0247 \*\* | - | - |   |
|   | (-2.8382) |   | (-2.0758) |   |
|   |   |   |   |   |   |   |   |
|   | FEIN | - | 0.0357 |   | - | - | 0.0015 | - |   |
|   | (0.8758) |   | (0.1911) |   |
|   |   |   |   |   |   |   |   |
|   | FEEN | - | -0.0705 \*\*\* | - | - | -0.0123 \*\* | - |   |
|   | (-2.7403) | (-2.3381) |   |
|   |   |   |   |   |   |   |
|   | FEIR | - | - |   | .2689 | - | - | 0.0046 |   |
|   |   | (0.6714) | (0.0596) |   |
|   |   |   |   |   |   |   |   |
|   | FEER | - | - |   | -0.8229 \*\*\* | - | - | -0.1586 \*\*\* |   |
|   |   | (-3.1617) | (-2.9892) |   |
|   |   |   |   |   |   |   |   |
|   | LEV | 1.0767 \*\*\* | 1.0815 \*\*\* | 1.0780 \*\*\* | 0.1120 \*\*\* | 0.1126 \*\*\* | 0.1116 \*\*\* |   |
|   | (8.2737) | (8.3052) |   | (8.2821) | (4.0259) | (4.0446) | (4.0091) |   |
|   |   |   |   |
|   | SIZE | 0.2210 \*\*\* | 0.2188 \*\*\* | 0.2165 \*\*\* | 0.0087 \* | 0.0083 | 0.0077 |   |
|   | (8.5554) | (8.4883) |   | (8.3699) | (1.7023) | (1.6118) | (1.5010) |   |
|   |   |   |   |
|   | AGE | -0.0482 \*\*\* | -0.0481 \*\*\* | -0.0481 \*\*\* | -0.0107 \*\*\* | -0.0106 \*\*\* | -0.0106 \*\*\* |   |
|   | (-8.3830) | (-8.3734) | (-8.3699) | (-9.0232) | (-9.0112) | (-9.0034) |   |
|   |   |   |
|   | MOLD | -0.0050 | -0.0053 |   | -0.0057 | -0.0001 | -0.0002 | -0.0002 |   |
|   | (-0.7141) | (-0.7517) | (-0.8074) | (-0.0563) | (-0.1133) | (-0.1805) |   |
|   |   |   |
|   | YEAR / INDUS | control | control |   | control | control | control | control |   |
|   | Obs | 10704 | 10704 |   | 10704 | 10704 | 10704 | 10704 |   |
|   | R ADJ 2 | 0.0622 | 0.0620 |   | 0.0622 | .0961 | .0961 | 0.0964 |   |
|   | F value | 28.3059 \*\*\* | 28.2157 \*\*\* | 28.2900 \*\*\* | 44.7532 \*\*\* | 44.7670 \*\*\* | 44.8971 \*\*\* |   |

Note: \* , \*\* , \*\*\* representatives of 10% , 5% and 1% on a significant level ( two-tailed )

|  |  |  |
| --- | --- | --- |
|  Table 7 Female directors and corporation diversification: differences in key positions with non-key positions |   |   |
| variable | (1) N |   | (2) EI | (3) N | (4) EI | (5) N | (6) EI |   |
| Intercept | 1.7197 \*\*\* |   | 0.9269 \*\*\* | 1.7587 \*\*\* | 0.9289 \*\*\* | 1.7212 \*\*\* | 0.9272 \*\*\* |   |
| (3.0110) |   | (8.2722) | (3.0995) | (8.3098) | (3.0135) | (8.2733) |   |
|   |   |   |
| FENN | -0.0194 | -0.0040 |  |  |  |  |   |
|  |  |   |
|   |  (-0.8545)  |  (-0.8905) |   |   |   |
| FENI |  |  |  |  | 0.0361 | 0.0016 |   |
| (0.8861) | (0.2051) |   |
|   |   |   |   |   |   |
| FENE |  |  | -0.0477 \* | -0.0070 | -0.0483 \* | -0.0070 |   |
| (-1.7383) | (-1.2534) | (-1.7599) | (-1.2580) |   |
|   |   |   |   |
| FENK | -0.2290 \*\*\* | -0.0521 \*\*\* | -0.2312 \*\*\* | -0.0523 \*\*\* | -0.2320 \*\*\* | -0.0523 \*\*\* |   |
| (-3.4113) | (-3.8161) | (-3.4435) | (-3.8311) | (-3.4556) | (-3.8327) |   |
|   |   |
| LEV | 1.0840 \*\*\* | 0.1124 \*\*\* | 1.0808 \*\*\* | 0.1120 \*\*\* | 1.0786 \*\*\* | 0.1119 \*\*\* |   |
| (8.3398) | (404.16) | (8.3112) | (4.0230) | (8.2807) | (4.0188) |   |
|   |   |
| SIZE | 0.2186 \*\*\* | 0.0082 | 0.2177 \*\*\* | 0.0081 | 0.2183 \*\*\* | 0.0082 |   |
| (8.4697) | (1.5948) | (8.4709) | (1.5857) | (8.4715) | (1.5903) |   |
|   |   |
| AGE | -0.0486 \*\*\* | -0.0108 \*\*\* | -0.0485 \*\*\* | -0.0107 \*\*\* | -0.0486 \*\*\* | -0.0107 \*\*\* |   |
| (-8.4717) | (-9.1033) | (-8.4573) | (-9.1014) | (-8.4675) | (-9.1025) |   |
|   |   |
| MOLD | -0.0055 | -0.0002 | -0.0057 | -0.0002 | -0.0055 | -0.0002 |   |
| (-0.7877) | (-0.1505) | (-0.8066) | (-0.1523) | (-0.7755) | (-0.1449) |   |
|   |   |
| YEAR / INDUS | control | control | control | control | control | control |   |
| Obs | 10704 | 10704 | 10704 | 10704 | 10704 | 10704 |   |
| R & lt ADJ 2 | 0.0622 | 0.0967 | 0.0624 | 0.0968 | 0.0624 | 0.0967 |   |
| F value | 28.3209 \*\*\* | 45.0932 \*\*\* | 28.4071 \*\*\* | 45.1251 \*\*\* | 27.3844 \*\*\* | 43.4513 \*\*\* |   |

Note: \*, \*\*, \*\*\* representatives of 10% , 5% and 1% on a significant level ( two-tailed )