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**Enterprise risk management and company's performance: An empirical evidence from
Chinese commercial industry**

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Enterprise Risk Management and Company's Performance: An Empirical Evidence from Chinese Commercial Industry

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Abstract: The purpose of this study is to investigate the relationship between ERM and company performance in the Chinese commercial industry. I construct an enterprise risk management index from strategy aspect and operation aspect to find the ERM level of Chinese commercial companies. I also define ERM as an integrated, comprehensive and strategic management with the method of Simona-lulia (2014). Using a sample of 175 Listed Chinese commercial companies from 2009 to 2018, I find that the imperfect ERM in the whole Chinese commercial industry had negative effects on company's performance. I also find that company size, financial leverage and intellectual capital can influence enterprise risk management. These results establish a strong link between enterprise risk management and company performance in Chinese commercial industry.

Keywords: enterprise risk management; company performance; Chinese commercial industry.

Data Availability: The data are publicly available from the sources identified in the paper.

I. INTRODUCTION

Nowadays globalization has made the business environment more and more complex, and many companies are facing increasingly serious challenges. In this situation, more and more companies focus on not only making profits but also on preventing risk. The companies which are facing big challenges put risk management at an increasingly important level. However, risk management keeps developing in these years. Enterprise risk management is different from traditional risk management. Enterprise risk is an extension of traditional risk management. It is not only about preventing risk, but also about how to make full use of company's resources to make more profit (Nocco et al. 2016).

With more and more attention paid to enterprise risk management, many researchers try to explore the relationship between enterprise risk management and company's performance. Mohammed et al (2016) has found that there is a positive relationship between risk management and company performance in listed companies in Prague. Nocco et al (2006) has introduced the differences between enterprise risk management and traditional risk management from theoretical aspects. The positive relationship between company size and enterprise risk management is found by Bertinetti et al (2013) and Pagach et al (2010). Bertinetti et al (2013) have also pointed out the negative influence of financial leverage on enterprise risk management. Besides, there is also existing a positive relationship between enterprise risk management and intellectual capital (Mohammed and Knapkova 2016). Besides, enterprise risk management also has a positive impact on company performance (Bertinetti et al. 2013; Pagach et al. 2010).

No prior study examines the relationship between enterprise risk management and Chinese listed companies, especially in a specific industry. Instead, in order to test the relationship between enterprise risk management and company performance, prior research has focused on the influence of enterprise risk management in Prague listed companies, European listed companies and American listed companies (e.g., Mohammed et al. 2016; Bertinetti et al. 2013; Pagach et al. 2010). However, different countries have different enterprise risk management level and develop enterprise risk management in their own ways. It's hard to apply their results to Chinese companies. In addition, different industries in one country also perform differently towards enterprise risk management. Country-wide levels of risk management and problems cannot be applied to a single industry. By examining the relationship between enterprise risk management and Chinese commercial industry instead of the whole Chinese companies, I can test the influences of enterprise risk management on a specific industry and point out the problems in the development of ERM in Chinese commercial industry. As such, my study complements and extends prior work that examine the relationship between enterprise risk management and company performance.

This research is made to figure out the impact of enterprise risk management on Chinese commercial industry. Since nowadays China is developing quickly and also focusing more on risk management. However, there are some problems for China to do risk management because China's research on risk management is still in its infancy (Liu and Li 2007). The cultural consideration is one of the problems for doing risk management (Liu and Li 2007). If China wants to develop quickly in risk management, China need to learn from foreign countries' risk management model. This research provides a quantitative way to test the effect of ERM in

Chinese commercial industry.

In this research, I construct two regression models based on Mohammed's (2016) model and Sun's (2012) model to analyze the company factors which can influence enterprise risk management and examine the relationship between enterprise risk management and company performance in Chinese commercial companies. I find that firms that do enterprise risk management have worse company performance than the firms that don't do enterprise risk management. Besides, my evidence shows that there are positive influences of company size and intellectual capital on enterprise risk management in Chinese commercial companies. Another finding is that there is a negative relationship between financial leverage and ERM.

This study contributes to the literature in many ways. Most importantly, this is the first study to test the relationship between ERM and company performance in Chinese commercial industry, and I provide strong evidence in support of the results. Since my sample is big enough to represent the commercial industry in China and my time period for data collected is also long enough to support my results. Furthermore, my empirical tests have several control variables to ensure the accuracy of the results and I still find a strong relationship between ERM and company performance in Chinese commercial industry. The most of results are consistent with the existing literature. Finally, this study contributes to the literature on ERM's impact by applying ERM to a specific industry to analyze. My results suggest that company performance relates to its enterprise risk management level.

The remainder of my paper is organized as follows. In the next section, I briefly review relevant literature and develop some hypotheses. In section 3, I explain my data and research methodology. In section 4, I describe the main results of regression models. In section 5, I make a discussion about the reasons for the results. In section 6, I make a conclusion.

II. LITERATURE REVIEW

Concept Define

Traditional Risk Management

In recent years more and more companies put risk management in an important position. The concept of risk management is getting more and more clear. Traditional risk management is a managerial process to control company's main activities to minimize accidental loss and reduce the potential probability of risk occurrence (Simona-lulia 2014). Traditional risk management has four functions: planning, organizing, leading and controlling. Traditional risk management includes five steps to make a decision. The first step is to find and analysis exposures to unexpected losses. It is essential to know where the risk comes from and what is the probability of risk. The managers also need to find whether there is any potential risk that cannot be estimated. The second step is examining whether alternative risk management techniques are useful for these exposures. This step is about to think up some useful ways to deal with exposures. The third step is selecting the best risk management technique after comparing these ways. The fourth and fifth steps are implementing the chosen risk management technique and monitor the results of it (Simona-lulia 2014).

These steps make the traditional risk management useful to deal with pure risk. However,

traditional risk management focuses more on individual risk. It assumes that there is no interaction between different risks. So company managers in different departments need to deal with risk separately. It is not convenient for a company to control risk management techniques. Nowadays more companies require that the risk should be treated as a whole (Simona-lulia 2014). Besides, other researchers pointed out that traditional risk management is no longer to solve today's business issues. Today's business environment is getting more and more complicated because of intense competition, natural disasters, and regulatory requirements (Layton 2007). For these reasons, the new risk management model called enterprise risk management exists.

Enterprise Risk Management

Enterprise risk management is an extension of traditional risk management. It improves the traditional risk management and summarizes risk management as an integrated, comprehensive and strategic system (Simona-lulia 2014). After business leaders realize the traditional risk management shortcomings, they begin to use enterprise risk management to control company's processes. It is integrated risk management and retains most concepts of traditional risk management. Enterprise risk management focuses more on company's strategic risk. It looks at the company as a whole and analyzes it from the top down. It also uses an enterprise risk management index to identify and estimate company's risk (Beasley 2016). So testing the relationship between ERM and company performance can provide some guidelines for business leaders to manage companies better.

Commercial industry in China

Commercial industry is an industry that focuses on widespread sales. It mainly includes wholesalers and retailers. The commercial industry aims to sell more products and get more profits. China's commercial industry is highly fragmented and composed of many small retailers (Lu 2010). At the same time, there are existing big differences between different retailers in China because of huge income differences between different regions of China (Lu 2010). It is harder for commercial companies to survive in such a competitive market. It is important for commercial companies to do enterprise risk management well. However, most of the commercial companies are at the beginning stage of doing enterprise risk management. Because of the imperfections of the ERM, many small retailers have only resorted to traditional risk management to reduce costs.

Risk Management and Company's performance

The performance of companies can be improved by an effective and integrated risk management system. To achieve this goal, companies need to invest a lot in risk management. However, business leaders expect to gain more from the investment in risk management and want a better improvement in company's performance (Pagach and Warr 2011). Business leaders need to know how to measure company performance in different aspects.

Effective risk management can help the company increase the possibility of getting capital

at a lesser required rate of return. Besides, good risk management can also reduce the possibility of bankruptcy (Mohammed and Knapkova 2016). The cost of getting capital can also be minimized. Because risk management will analyze the alternative ways of getting capital. After analyzing, a company can choose the best way to getting capital at lower risk or at a lower rate of return. The risk management can also make companies stable to earn and reduce costs of capital. So the average cost of capital can be a good measure of company's performance.

Transaction cost

Effective ERM can make companies have good relationships with their customers and suppliers. Good relationships can make each transaction smoother. The transaction cost can also be reduced in a smoother transaction (Blome 2011). However, if one company has poor risk management, it will destroy relationships between companies and external parties (customers or suppliers). Company needs to spend more money and more effort to communicate with the external parties. Some companies may even lose their customers or supplies due to poor risk management. In this way, company needs to consider more about improving risk management to satisfy its customers or suppliers. It is a good way to create a win-win situation for both parties in one transaction. Transaction cost is an important measure to see the relationship between companies and external parties.

Company's stock value and assets

Effective ERM can also make one company outstanding in its industry. It can help companies develop quicker and make profits stably (Is wajuni et al. 2018). With developing and making profits, companies with good ERM will have more assets. Their stock values can also be increased because they can attract more investors by effective ERM. Poor risk management may cause companies to lose some opportunities in the future. In this way, it is essential for business leaders to improve risk management to catch every potential opportunity and get more assets for company to develop. The company's stock value and assets can be a measure of company's performance.

Hypothesis Development

The bigger companies are more likely to focus on enterprise risk management. The larger the companies are, the higher the monitoring and agency costs are. Big companies need to disclose more information to reduce the uncertain of company's performance (Zadeh and Eskandari 2012). Besides, big companies face more risk and have more requirements for risk management. They also have enough money to implement a good risk management plan. So the enterprise risk management index must have a relationship with company size.

H1: There is a positive relationship between enterprise risk management and company size in the Chinese commercial industry.

Effective enterprise risk management can make companies more reliable. A company with good ERM can borrow more money from others (Bertinetti et al 2013). Because proper enterprise risk management lets companies disclose exposures better. Companies with higher

leverage may gain more from effective enterprise risk management.

H2: There is a positive relationship between enterprise risk management and company leverage in the Chinese commercial industry.

The larger intellectual capital one company has, the more value the company will make (Mohammed et al 2016). Because there is always an existing difference between market value and the book value of one company. The difference is mainly caused by the difference in intellectual capital. Intellectual capital can also influence company's performance. There may be a relationship between enterprise risk management and company intellectual capital.

H3: There is a positive relationship between enterprise risk management and company intellectual capital in the Chinese commercial industry.

This research is mainly testing the relationship between enterprise risk management and company's performance. A company with better risk management can deal with risk quickly and minimize the loss (Bertinetti et al. 2013; Pagach et al. 2010). Good risk management can improve company's performance.

H4: There is a positive relationship between enterprise risk management and company's performance in the Chinese commercial industry.

III. RESEARCH METHODOLOGY

Data and Sample

The empirical study is based on commercial industry companies listed on Shanghai stock exchange and Shenzhen stock exchange from 2009-2018. Ten years of annual company reports have been gathered to analysis the relationship between enterprise risk management and Chinese commercial industry company's performance. Currently, there are 175 commercial companies listed in Shanghai stock exchange and Shenzhen stock exchange. Besides, market data of these companies were collected. After the collection, data were checked and filtered. Companies with incomplete records were excluded from the study.

Empirical Model

To test the hypothesis, the research used the linear regression model to analyze the data. I used two regression models based on the methods of Mohammed (2016) and Sun (2012).

The first regression model is used to test whether there are any factors that can influence the enterprise risk management index. In this model, enterprise risk management index is the dependent variable. Company size, financial leverage, intellectual capital and insider are the independent variables.

$$\text{Model 1: } \text{ERMI} = \alpha_0 + \beta_1 \text{company size} + \beta_2 \text{financial leverage} + \beta_3 \text{intellectual capital} + \beta_4 \text{insider} + \varepsilon$$

The second regression model is used to test the impact of enterprise risk management and other factors on company performance. In the analysis, company performance is the dependent.

The study is to test the impact of enterprise risk management on company performance. So enterprise risk management index is an independent variable. The intellectual capital is also an independent variable. Because it will also influence company performance. As for insider, company size, financial leverage, future opportunity and profitability, these variables may have potential effects on the performance of companies. So they are control variables in this study.

$$\text{Model 2: Performance} = \alpha_0 + \beta_1 ERMI + \beta_2 \text{intellectual captial} + \gamma_1 \text{insider} + \gamma_2 \text{company size} + \gamma_3 \text{financial leverage} + \gamma_4 \text{future opportunity} + \gamma_5 \text{probablity} + \varepsilon$$

These two regression models are both very important. The first regression model is used to find the factors which can influence enterprise risk management in Chinese commercial companies. The results of the regression model 1 is useful for Chinese commercial companies to improve their enterprise risk management. The second regression model is used to find the impact of enterprise risk management on current Chinese commercial companies. It is designed to describe the current situation of enterprise risk management in Chinese commercial companies and figure out how to improve company performance well.

The regression model variables are defined in the following table.

Table 1
Description of study variables

Variables	Description	Type	Source
Enterprise risk management index (ERMI)	ERMI=Strategy + Operation	Independent	Sun, 2012
Intellectual Capital (INTCAP)	Market value of the outstanding stock over book value of the firm	Independent	Mohammed et al, 2016
Performance (PERF)	Net income (loss) over shareholders' equity (ROE)	Dependent	Sun, 2012
Insider (INSID)	Proportion of shares held by senior management in total shares	Control	Sun, 2012
Company size (COMSIZE)	Natural Logarithm of total asset	Control	Mohammed et al, 2016
Financial leverage (FINLEV)	Long term debt over total Equity	Control	Mohammed et al, 2016
Future opportunity (FUOP)	One-year business growth rate	Control	Sun, 2012
Profitability (PROF)	Return on assets	Control	Sun, 2012

Explanation:

$$\text{Strategy index} = \frac{(\text{one year sales volume} - \text{one year industry average sales})}{\text{Standard deviation of sales of all companies in the same industry}} \quad (\text{Sun 2012})$$

$$\text{Operation index} = \frac{\text{Sales}}{\text{Total assets}} \quad (\text{Sun 2012})$$

There are eight variables in the two regression models. There are two independent variables, one dependent variable and five control variables. The ERMI is calculated from strategy aspect and operation aspect (Sun 2012). The strategy index is calculated from one year sales volume minus one year industry average sales, then divided by the standard deviation of sales of all companies in the same industry (Sun 2012). The operation index is calculated from sales divided by total assets. Intellectual capital, performance, insider, company size, financial leverage, future opportunity and profitability are calculated through Sun (2012) and Mohammed's et al. (2016) methods.

IV. Results

4.1 Descriptive Statistics

After using the CSMAR to collect the data for 175 Chinese commercial companies, I find there are some incomplete records, so I further processed and filtered the data to get the table of descriptive statistics for my research variables. The detailed information of each variable is shown in the Table 2.

Table 2
Results of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ERMI	1516	1.365	1.922	-.536	12.887
INTCAP	1516	4.594	14.226	-125.627	348.628
PERF	1516	.069	.34	-4.295	9.498
INSID	1516	.025	.088	0	.63
COMSIZE	1516	22.223	1.264	17.604	26.105
FINLEV	1516	.536	1.211	0	10.956
FUOP	1516	.338	3.268	-.986	87.484
PROF	1516	.037	.099	-.654	2.933

After screening the raw data, 1516 observations for 175 Chinese Commercial Company are retained. There are 8 variables in the Table 1. The variable of ERMI shows a maximum ERMI of 12.887 and a minimum ERMI of -0.536.

The best performance of selected companies is 9.498 and the worst performance of selected companies is -4.295. There are some companies with 0 insider index and 0 financial leverage.

Intellectual Capital and Future Opportunity are the two variables with the largest standard deviation. The standard deviation of intellectual capital is 14.226 and the standard deviation of future opportunity is 3.268. These show the high level of variability of the intellectual capital and future opportunity of the selected companies.

4.2 Correlation Analysis

After describing the data as a whole, I do correlation analysis for each variable. The results are in the Table 3.

Table 3
Results of Pairwise correlations test

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ERMI	1.000							
(2) INTCAP	-0.060**	1.000						
(3) PERF	-0.030	-0.076***	1.000					
(4) INSID	-0.046*	-0.009	0.008	1.000				
(5) COMSIZE	0.443***	-0.252***	0.057**	-0.085***	1.000			
(6) FINLEV	0.080***	-0.066***	0.022	-0.078***	0.368***	1.000		
(7) FUOP	0.025	0.122***	0.010	0.001	0.046*	0.175***	1.000	
(8) PROF	-0.024	0.012	0.265***	0.034	-0.051**	-0.050*	-0.003	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The results of the Pairwise correlation show the relationships and significance of the variables. In this table, three stars mean that p is smaller than 0.01, two stars mean that p is smaller than 0.05 but bigger than 0.01, one star means that p is smaller than 0.1 but bigger than 0.05. Three stars indicate that the significance is at the 1 percent level and two stars indicate significance is at the five percent level. One star suggests that significance is at 10 percent level. Table 3 can show in detail the relationship between each of the two variables and the significance of the relationship. There are some positive and negative relationships shown in the table 3. The highest correlation coefficient is 0.443 between the variables of ERMI and company size. There was a strong relationship between ERMI and company size. This correlation coefficient is significant because its significance is at the 1 percent level. The lowest correlation coefficient is 0.001 between the variables of insider and future opportunity. However, this correlation coefficient is significant.

4.3 Results of the Variance Inflation Factor Test

In order to ensure that the two regression models are more accurate, I do the variance inflation factor test to find out whether there are any problems of multicollinearity in these two models.

Table 4
Variance inflation factor of model 1

	VIF	1/VIF
COMSIZE	1.236	.809
FINLEV	1.16	.862
INTCAP	1.07	.935

INSID	1.011	.989
Mean VIF	1.119	.

This table tests the variance inflation factor of model 1. The mean VIF of these four variables in table 4 is a small value of 1.119. It is much smaller than the benchmark of 10, which means there was no problem of multicollinearity in regression model 1's variables.

Table 5
Variance inflation factor of model 2

	VIF	1/VIF
COMSIZE	1.542	.648
ERMI	1.262	.793
FINLEV	1.208	.828
INTCAP	1.094	.914
FUOP	1.052	.951
INSID	1.012	.988
PROF	1.005	.995
Mean VIF	1.168	.

This table tests the variance inflation factor of model 2. The mean VIF of these seven variables in table 5 is also a small value of 1.168. The benchmark of 10 is much bigger than this test value, so there was no problem of multicollinearity in regression model 2's variables.

4.4 Hausman Test

The probability value of Hausman test can help me make a decision between the fixed effect regression model and the random effect regression model. From the Hausman test, I can know which regression model can give a more accurate result. In the Hausman test, the null hypothesis is that random effect model is appropriate. The alternative hypothesis is that fixed effect model is appropriate.

Table 6
Hausman (1978) specification test of model 1

	Coef.
Chi-square test value	5.07
P-value	.28

The P-value of the Hausman specification test is 0.28, which is much bigger than 0.05. So I can't reject the null hypothesis. The result of the Hausman specification of model shows that it is better to choose random effect regression model for model 1.

Table 7
Hausman (1978) specification test of model 2

	Coef.
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Chi-square test value	14.272
P-value	.047

The P-value of the Hausman specification test is 0.047, which is very close to 0.05. So it is reasonable to choose either fixed effect model or random effect model. In this research, I chose the random effect regression model for model 2.

4.5 Results of Random effect regression model 1

The model 1 is used to test whether there are any factors that can influence the enterprise risk management index.

Table 8
Regression results of ERMI factors model

ERMI	Coef.	St.Err.	t-value	p-value	[95% Conf Interval]	Sig
COMSIZE	.584	.036	16.04	0	.513	.655 ***
FINLEV	-.054	.029	-1.89	.059	-.11	.002 *
INTCAP	.003	.002	1.65	.1	-.001	.007 *
INSID	.294	.526	0.56	.576	-.737	1.325
Constant	-11.642	.813	-14.32	0	-13.235	-10.048 ***
Mean dependent var		1.365	SD dependent var		1.922	
Overall r-squared		0.203	Number of obs		1516.000	
Chi-square		276.203	Prob > chi2		0.000	
R-squared within		0.147	R-squared between		0.217	

*** $p < .01$, ** $p < .05$, * $p < .1$

The results of ERMI factors regression model show that overall R-squared is 0.203. It means that 20.3% of the cross-sectional variability in ERMI is accounted for by the variables of company size, financial leverage, intellectual capital and insider. The coefficient between ERMI and company size is 0.584. The coefficient is at 1 percent significance level. The coefficient between financial leverage and ERMI is -0.054. The coefficient between intellectual capital and ERMI is 0.003. These two coefficients are at 10 percent significance level. The relationship between insider and ERMI is significant.

4.6 Results of Random effect regression model 2

The model 2 is used to test the impact of enterprise risk management and other factors on company performance.

Table 9
Regression results of company performance factors model

PERF	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
ERMI	-.011	.005	-2.30	.021	-.021	-.002	**
INTCAP	-.002	.001	-2.49	.013	-.003	0	**
INSID	.009	.096	0.09	.925	-.179	.197	
COMSIZE	.022	.008	2.64	.008	.006	.038	***
FINLEV	.001	.008	0.16	.877	-.014	.016	
FUOP	.002	.003	0.61	.542	-.004	.007	
PROF	.918	.085	10.85	0	.752	1.083	***
Constant	-.427	.18	-2.37	.018	-.779	-.074	**
Mean dependent var		0.069	SD dependent var			0.340	
Overall r-squared		0.083	Number of obs			1516.000	
Chi-square		135.809	Prob > chi2			0.000	
R-squared within		0.049	R-squared between			0.501	

*** $p < .01$, ** $p < .05$, * $p < .1$

The results of company performance factors model show that the overall R-squared is 0.083. The correlation coefficient between ERMI and company performance is -0.011. It is at five percent significance level. The correlation coefficient of -0.002 between intellectual capital is also at five percent significance level. The coefficients of company size and profitability are at 1 percent significance level. The coefficients of these two variables are 0.022 and 0.918. They are positive relationships.

V. Discussion

Main Results and Explanation

ERMI and Company Size

For the hypothesis 1, it is important to find the specific relationship between ERMI and company size. The correlation analysis table 3 shows that the correlation coefficient between ERMI and company size is 0.443. It has three stars behind it which means it is at 1 percent significance level. From the table 8, the coefficient of 0.584 between ERMI and company size in the results of regression model indicates that there was a strong positive relationship between company size and ERMI. From the results of these two tests, the hypothesis 1 that there is a positive relationship between company size and ERMI in Chinese commercial industry should be accepted. The result of this positive relationship between company size and ERMI is similar with the previous research made by Bertinetti et al (2013). Another research made by Pagach et al (2010) pointed out that the bigger companies were more likely to implement enterprise risk management. The bigger the company was, the bigger probability of it had enterprise risk management. The bigger the company was, the higher the level of its enterprise risk management was. Because big companies had enough resources to do enterprise risk management.

ERMI and Financial Leverage

For the hypothesis 2, the relationship between ERMI and financial leverage can be analyzed from table 3 and table 8. In table 3, the correlation coefficient between ERMI and financial leverage is 0.080. The results show a 1 percent significance level. It shows the high correlation between ERMI and financial leverage. However, after considering other variables, the regression results in table 8 show a negative relationship between financial leverage and ERMI. So hypothesis 2 should be rejected. The results show that there was a negative relationship between company leverage and ERMI in Chinese commercial companies. The results were consistent with the previous research made by Bertinetti et al (2013). They pointed out that there was a negative effect of company leverage on enterprise risk management. For hypothesis 2's result, it is unexpected because it shows a negative relationship between company leverage and ERMI in Chinese commercial companies. The regression model tests the variable of company leverage's effects on ERMI. It shows the larger company leverage was, the harder the company did good enterprise risk management. Actually, from the definition of enterprise risk management, good enterprise risk management can help a company manage the risk well, which allows the company to have a larger financial leverage to make more profit. However, conversely, the positive relationship did not exist between financial leverage and ERMI. It is because a company which has higher leverage also have bigger amounts of debt. The bigger amount of debt can put the company in higher risk (Kesavan 2019). The high risk was hard for companies to manage. So high company leverage pushed a company to do risk management but most of the companies in Chinese commercial industry couldn't do enterprise risk management well. As a result, there was a negative relationship between company leverage and ERMI in Chinese commercial companies.

ERMI and Intellectual Capital

For the hypothesis 3, The results can be found from table 3 and table 8. Table 2 shows the high correlation between ERMI and intellectual capital. The regression model in table 8 indicates that there was a positive relationship between intellectual capital and ERMI. The hypothesis 3 can be also accepted. The results prove that there was a positive relationship between intellectual capital and ERMI in Chinese commercial companies. It is consistent with the results made by Mohammed et al (2016). They also showed that companies with greater intellectual capital can have a better risk management (Mohammed and Knapkova 2016). Intellectual is about company's goodwill and employees' skills. It can add up company's value potentially. The more the employees had good skills, the better the company's enterprise risk management was. Because these employees could be easily trained to do good enterprise risk management. The better a company's goodwill was, the better the enterprise risk management was. Because nice goodwill could provide a good environment for company to develop its enterprise risk management.

ERMI and Company Performance

For the hypothesis 4, the table 3 shows that there was a low correlation between company performance and ERMI in Chinese commercial companies. The regression model from table 9 also indicates that there was a negative relationship between enterprise risk management and Chinese commercial companies' performance. The hypothesis 4 should be rejected. However, the results were inconsistent with the previous researches. The findings of Bertinetti et al (2013), Pagach et al (2010) and Mohammed et al (2016) showed that there was a positive relationship between enterprise risk management and company performance. However, the result in this research that there was a negative relationship between enterprise risk management and Chinese commercial companies' performance was unexpected. Different company or industries could have different situations. Enterprise risk management actually can improve a company's performance. However, in Chinese commercial industry, most companies focused on how to reduce costs. Most of these companies only used traditional risk management. Some commercial companies were at the beginning stage of implementing ERM. It was a long process for them to improve their enterprise risk management. In Chinese commercial industry, enterprise risk management hasn't been perfected and popularized. The companies that did enterprise risk management may spend more money. It would increase its transaction costs. As a result, the imperfect ERM in the whole Chinese commercial industry had negative effects on company's performance.

The regression analysis also shows other significant relationships. It indicates that there was a strong positive relationship between company size and company performance. The bigger a company was, the better performance it had. Another finding is that there is a strong positive relationship between company's profitability and company's performance. It means that company's profitability was a strong representative of the company's performance.

Limitation of this research

This research only focused on the strategy and operate parts of enterprise risk management. The ERMI can't fully reflect the actual enterprise risk management level of each company. The ERMI can be further improved. This research only chooses one specific industry in China to analysis the relationship between enterprise risk management and company performance. Besides, in order to collect complete data, the research only chooses the listed Chinese commercial companies. And the ERMI factors model and company performance factors model can add more variables to analyze more detailed.

Reliability and Validity of this research

The reliability of my results is good. There is no participant error because I choose a long time period of 10 years to observe each variable of Chinese commercial companies. There is no participant bias because I collect the data from CSMAR and each company's data is independent and accurate. There is no research error because I collect the same time period data and set the same variables for each company. There is also no research bias because I use an objective way to get and analyze the data.

The construct validity of this research is good because I made the Hausman test to help me choose my research strategy. I also made the VIF test to make the variables more accurate in

this research. The external validity is also good because the sample of this research includes the whole Chinese commercial industry. The sample is enough representative of this research.

Theoretical Contribution

This study is about the relationship between enterprise risk management and company performance in the Chinese commercial industry. The enterprise risk management index and company performance are the main variables in this study. It provides a quantitative way to test the impact of enterprise risk management on company performance. Besides, this study chooses one specific industry in China to analysis. It is more detailed and can provide a guideline for other industries in China to develop. It took the strategy of companies as a measurement of enterprise risk management. So companies can improve their strategy from the results. Nowadays China is at the beginning stage of developing risk management and Chines business environment is getting more and more complex. So this study can provide a point that the importance of enterprise risk management and how enterprise risk management affects company performance. Especially for commercial companies, they can get more information from this study. Last but not least, from this study, the same research in other industries can also be done in the future. And more detailed research about enterprise risk management can also be made from this study because this study provides some basic information and points that can be discussed in the future.

VI. Conclusion

This research investigates the link between enterprise risk management and company performance in a sample of 175 Chinese commercial companies listed on Shanghai Stock Exchange and Shenzhen Stock Exchange. The first hypothesis which stated as there was a strong positive relationship between company size and enterprise risk management in Chinese commercial companies should be accepted. Big companies could do better risk management. The result is consistent with the previous researches made by Bertinetti et al (2013) and Pagach et al (2010). My findings also indicate that there was a negative relationship between company leverage and ERMI in Chinese commercial companies. The second hypothesis should be rejected. Higher leverage can make it harder for Chinese commercial companies to do enterprise risk management well. This result is consistent with what Bertinetti et al (2013) found. The positive between intellectual capital and enterprise risk management in Chinese commercial companies is consistent with what I expected. Because nice goodwill and skilled employees could provide a good environment for a company to develop its enterprise risk management. As a result, the third hypothesis need to be accepted. The result of hypothesis four was unexpected, but it met the conditions of Chinese commercial industry. The result was that there was a negative relationship between enterprise risk management and Chinese commercial companies' performance. Companies which did enterprise risk management may have lower performance than companies which didn't do. Chinese commercial companies need to improve the whole industry's enterprise risk management level to deal with this problem.

This research is important to provide a guideline for enterprise risk management to develop quicker in Chinese commercial industry. It can also reflect the problems of developing enterprise risk management in China.

The limitation of this study is that it is only about enterprise risk management in Chinese commercial industry. The results can't be applied to the whole companies in China. Besides, this research doesn't provide any detailed solutions for Chinese commercial industry to develop enterprise risk management better.

Further research is needed to focus more on enterprise risk management in other industries in China and list some specific ways to improve enterprise risk management in China.

Reference

- Beasley, M.S., Clune, R. and Hermanson, D.R., 2005. Enterprise risk management: An empirical analysis of factors associated with the extent of implementation. *Journal of accounting and public policy*, 24(6), pp.521-531.
- Bertinetti, G.S., Cavezzali, E. and Gardenal, G., 2013. The effect of the enterprise risk management implementation on the firm value of European companies. Department of Management, Università Ca'Foscari Venezia Working Paper, (10).
- Blome, C., & Schoenherr, T. (2011). Supply chain risk management in financial crises—A multiple case-study approach. *International journal of production economics*, 134(1), 43-57.
- Iswajuni, I., Manasikana, A. and Soetedjo, S., 2018. The effect of enterprise risk management (ERM) on firm value in manufacturing companies listed on Indonesian Stock Exchange year 2010-2013. *Asian Journal of Accounting Research*, 3(2), pp.224-235.
- Kesavan Balasubramaniam, 2019. Operating Leverage and Financial Leverage.
- Liu, J., Li, B., Lin, B. and Nguyen, V., 2007. Key issues and challenges of risk management and insurance in China's construction industry: An empirical study. *Industrial Management & Data Systems*, 107(3), pp.382-396. Vancouver
- Layton, M. and Wagner, S., 2007. Traditional Risk Management Inadequate To Deal with Today's Threats. International Risk Management Institute.
- Lu, S., 2010. Understanding China's Retail Market.
- Mohammed, H.K. and Knapkova, A., 2016. The impact of total risk management on company's performance. *Procedia-Social and Behavioral Sciences*, 220, pp.271-277.
- Nocco, B. W., & Stulz, R. M. Fall 2016. *Applied Corporate Finance*.
- Pagach, D.P. and Warr, R.S., 2010. The effects of enterprise risk management on firm performance. Available at SSRN 1155218.
- Pagach, D. and Warr, R., 2011. The characteristics of firms that hire chief risk officers. *Journal of risk and insurance*, 78(1), pp.185-211.
- Simona-lulia, C., 2014. Comparative study between traditional and enterprise risk management—a theoretical approach. *The Annals Of The University Of Oradea*, P.274.
- Sun, Y., 2012. Study of the Relationship between Enterprise Risk Management and Corporate Performance.
- Zadeh, F.O. and Eskandari, A., 2012. Firm size as company's characteristic and level of risk disclosure: Review on theories and literatures. *International Journal of Business and Social Science*, 3(17).