

Determinants of Corporate Risk Taking and Risk-Return Relationship

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Abstract

This research empirically tests for the determinants of corporate risk taking and the risk-return relationship in China, with the sample of listed companies' financial data from 2004 to 2012 in the electric power and thermal industry in China. The authors use a dynamic model that included risk, corporate performance, industry performance, performance expectations and aspirations. The results presented in the test suggest that corporate performance and past risk both have a negative influence on corporate risk, while performance expectations and aspirations have a positive influence on corporate risk. It provides evidence of the argument on the corporate risk-return relations of Behavioral Theory of Firm. A low-performance corporate will seek risk actively and a high-performance corporate will avoid risk. The phenomenon of "Bowman's paradox" exists in China's enterprises.

Key words: Risk-return relationship; Performance; Behavioral Theory of Firm; Bowman's paradox

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INTRODUCTION

The risk-return relationship has always been the important issues of research in economics and strategic management.

The traditional Finance Theory considers that the association between risk and returns is positive and high risk is accompanied by high returns and vice versa (Sharpe, 1964; Fama & MacBeth, 1973). However, high risk-low profits companies and low risk-high profits companies can be always found in the reality. Many researchers have conducted a research on this phenomenon. Sparked by Bowman (1980, 1982, 1984), many recent studies of strategy have included risk measures. Part of the attention has focused on what Bowman described as a paradox. Using a capital markets analogy, he predicted that risky projects and investments would need to offer higher earnings than other projects to be attractive and that by extension, variable income flows would be associated with high average income. Instead, he found negative associations between variance in returns and the level of returns in most of 85 industries that he chose. Since Bowman (1980), numerous studies have investigated risk-return connections. Fiegenbaum and Thomas (1985, 1986) found some industries with positive associations between returns and variance in returns and some with negative associations. They also found that the associations varied over time. Fiegenbaum and Thomas (1988) reported a positive association between returns and variance in returns for above-average performers and a negative associations for below-average performers. This pattern is consistent with Bowman's concept of "risk seeking by trouble firms" (Bowman, 1982, p.33), which he associated with the prospect theory of Kahneman and Tversky (1979). Related studies have focused on risk and return relative to diversification (Amit & Livnat, 1988; Bettis & Mahajan, 1985; Chang & Thomas, 1987); business unit risk assessed in terms of both accounting-based measures of systematic risk (Aaker & Jacobson, 1987) and a variety of accounting and operational risk measures (Woo, 1987); and corporate risk and return relative to structural and operational variables (Jemison, 1987; Singh, 1986). Fiegenbaum and Thomas (1988) provide an excellent survey of the risk-return literature.

However, the research on risk in enterprise strategic management in China is still in its infancy. Existing literature focus on the risk of specific strategic behavior and related strategy research (Zhu & Zhu, 2003; Liu, 2004), review and evaluation on western strategic risk (Liu & Li, 2003; Zhang, 2009), the formation mechanism of strategic risk (Yang & Xi, 2002), strategic risk identification (Guo, 2005), the analysis of strategic risk elements (Wang & Xiang, 2005) and the strategy control system of risk (Long & Xia, 2006). But there is little research on the relations between enterprise risk and returns. Only Zhu (2008), Zeng (2008) and Zeng (2011) tested the enterprise strategic risk-return relations empirically. They all concluded that there is negative association between risk and returns. But this research considers that there are some problems in their research, which has a direct impact on the credibility of the empirical results. The main problems are: (a) their empirical analysis only focus on analyzing the association between strategic risk and returns, which was rough. The analysis neglected other factors' possible impact on the strategic risk-return relationship and possible structural complex relationship between these factors and risk-return. Further research needs to adopt the multiple regression model or structured model to explore possible relationship between the strategic risk and returns more deeply. (b) Zhu Zhiming used the event study method, Zeng Yongyi used the element analysis while Zeng jin only used the association analysis. They all pointed that the multivariate regression analysis may be a better research method in their papers. (c) Zeng (2008) used conventional variance method to measure risk. But then Zeng (2011) found that because of the left-skewed data, the use of conventional variance method leads to false empirical results. Zhu zhi ming and Zeng (2011) both used the ordinal method to measure strategic risk. The method's applicable conditions are harsh, which requires that industries have a clear boundary and stable structure and companies' risk is steady available for time to be added. These conditions are hard to all be satisfied in the study of multiple industries for a long time window. They all pointed that there are many other risk measures to be selected, such as the standard deviation of the securities analysts' forecasts of earnings per share for the year and so on, which may measure the strategic risk more accurately. But because they could not acquire the related data, they did not use this measure.

Based on summarizing the scholars' research, this research adopts the standard deviation of the securities analysts' forecasts of earnings to measure enterprises' risk and build the risk model based on Cyert and March's (1963) behavioral theory of the firm. This research selects the listed companies in the electric power, heat production and supply industry in China as our sample and adopts the multivariate regression analysis to identify the determinants of enterprise risk and the possible association

between risk and performance in China. The answers to the questions addressed in this research may contribute to knowledge in three areas. First, by specifying and testing a model of corporate risk taking, this work attempts to advance understanding of the determinants of Chinese corporate risk taking and performance. It advances the research on risk by (a) presenting and estimating a dynamic model based on a specific theory of organizations, (b) using an ex ante measure of risk taking. Second, because Cyert and March's (1963) behavioral theory of the firm underlies the model tested, the research can be seen as a large sample test of that theory in China. Third, the research provide robust empirical evidence from listed companies for the existence of *Bowman paradox* in China.

1. LITERATURE REVIEW AND THEORETICAL ANALYSIS

The risk-return relations research dates back to the Knight's (1921) pioneer work in the 1920s. With strategic management has gradually become an independent discipline in 1970s, the risk-return relations research got the attention by the strategic management researchers. Researchers generally consider that Bowman's (1980) research is origin of risk issues research in strategic management. Compared to the positive association between risk and returns, Bowman assumed that enterprise's high risk project needs to offer higher returns than other projects in order to be attractive, namely the variance in returns and average returns needs to be positive associated. However, among 85 American industries Bowman tested, there is significant negative association between the variance in enterprises' ROE and its averages in 56 industries, while the association presents positive only in 21 industries and the rest 8 industries presents no association at all. This discovery has violated the mainstream theory "high risk with high returns" at that time, so was called "Bowman paradox". Since Bowman's significant discovery, many researchers conducted a large number of further research on the enterprises' risk-return association and have made huge progress in the empirical and theoretical research. At present, there are two mainstream theories to explain the enterprises' risk-return association in academia: Contingent risk decision hypothesis and Strategic Endowment hypothesis. Ruefli and other researchers conducted a comprehensive review on it (e.g., Ruefli, 1999; Nickel, 2002).

Currently, the most widely accepted theory about enterprises' risk-return association is "Contingent risk decision hypothesis". Decision theory accepts three attitudes towards risk (a) risk averse: investments with less risk will be referred at the same expected return level. (b) risk seeking: investments with higher risk will be preferred at the same expected return level. These decision makers will assume higher risk because they will get higher

probability of reaching extraordinary returns because of the high variance values. (c) risk neutral: the higher expected return investment will be selected, independent of its risk level. The conventional finance theory usually assumed that decision makers are risk averse in the investment choice model (Kahneman & Tversky, 1979). This assumption leads to the risk-return association presents positive (Oviatt, 1991). Since Bowman's discovery, researchers began to doubt the traditional assumption of risk aversion. If decision makers are risk seeking, the risk-return association may be negative. That is to say, decision makers' attitude and behavior in face of risk affect the risk-return association. Risk averse leads to the positive risk-return association and risk seeking leads to the negative risk-return association. Contingent risk decision hypothesis covers two main theories: Prospect Theory and Behavioral Theory of the Firm.

Prospect theory considers that the decision makers' attitude towards risk is affected by their current situation and forecast decision consequences, which is associated with the reference point selected at decisions making time. When the expected results of an alternative are "good"-that is to say, they are higher than the reference point-the decision maker shows a risk-averse attitude (Fiegenbaum et al, 1995). When the expected results are "bad"-lower than the reference point-the decision maker will be risk seeking (Johnson, 1992; Sinha, 1994). High expected results lead to a risk-averse attitude and, therefore, a positive risk-return relationship, while low expected results lead to a risk-seeking attitude and, hence, a negative relationship. Prospect theory also points out that this second relationship will be steeper than the first (Kahneman & Tversky, 1979). Prospect theory has been proven by some empirical research (e.g., Chang & Thomas, 1989; Fiegenbaum & Thomas, 1988; Sinha, 1994).

Behavioral theory is the second theory that explains the paradox from the attitude towards risk showed by the firms, and it leads to similar hypotheses to prospect theory. With this focus, firms are described as large systems of standard operating procedures, where managers take decisions based on two different measures: the performance level they aspire to (aspirations), and the performance level they expect (expectations). According to this theory, the amount of risk managers will accept will depend on the expected performance in relation to the aspiration. When the expected performance is higher than the aspirations, managers consider that the firm is performing well, so no change is needed. Therefore, the association between risk and return present positive. If managers expect performance to fall below the aspiration level, creating a gap between aspirations and performance sufficient to create a sense of crisis, a major organizational change in the firm will be needed to find procedures and techniques that increase the performance. This change involves risk for the firm, because the consequences of change are usually less well known than the consequences

of the status quo. Finally, if no solution is found, managers will be forced to set lower aspirations. Therefore, the association between risk and return present negative.

Behavioral theory has been proven by some empirical research (e.g., Bromiley, 1991; Greve, 1998; Palmer & Wiseman, 1999). According to Strategic Endowment hypothesis, strategic risk and return both are two dimensions of the natural results that corporate strategic endowment causes and they are interdependent, but there is no causal relationship between them. Some enterprises own monopoly of strategic resources such as the dominant market position, managers with high ability, diversification strategy, consumer orientation and product patent and so on, which enable the enterprises to maintain low risk level and obtain high return at the same time. Strategic Endowment hypothesis considers this negative association may be natural results of corporate strategic endowment heterogeneity. Strategic Endowment hypothesis has also been proven by some empirical research (e.g., Andersen, Denrell, Bettis, 2007; Kim et al, 1993).

In addition, a few scholars tried to explain the risk-return relationship from Risks with Implicit Costs Hypothesis and Statistical Artifacts Hypothesis. According to Risks with Implicit Costs Hypothesis, companies' high risk and large variation of performance will increase the possibility of company defaults. It makes the company stakeholders such as suppliers, employees and customers unwilling to trade with companies and put specific investment into companies under the same currency compensation conditions. So high risk will reduce companies' operating income and increase operating costs, finally reduce companies' performance. This hypothesis has been proven by a few empirical research (e.g., Deephouse & Wiseman, 2000; Zeng, 2011). However, Statistical Artifacts Hypothesis considers that the strategic risk-return empirical relationship is only caused by the model misspecification. Maybe the association between risk and return is significantly negative, but this association has nothing to do with causality and so there is no need to discuss its causal meaning from the theoretical perspective. Some researchers have tested on it (e.g., Denrell, 2008; Henkel, 2009).

In conclusion, we can infer that academia reaches no agreement in the risk-return causal relations, but most scholars' research all support the mainstream theory: Contingent risk decision hypothesis and Strategic Endowment hypothesis. Compared to western listed companies, under Chinese special national conditions, the listing age of listed companies in China is short and their development is not mature. It means that our country's listed companies have a long way to go in raising management ability, training company core competitiveness in order to gain "high performance, low risk" sustainable development. So Strategic Endowment hypothesis is not suitable for our country's enterprises

(Zeng & Yang, 2011). In two theories explanations of Contingent risk decision hypothesis, Behavioral Theory of the Firm is more convincing and scientific than Prospect Theory. The reasons are as follows: (a) Behavioral Theory of the Firm researches enterprises' behavior, while Prospect Theory researches individuals' behavior; (b) compared to Prospect Theory, Behavioral Theory of the Firm considers the risk-return relationship is not only influenced by the risk attitude, and also influenced by other corporate traits. The model in this research is established on Behavioral Theory of the Firm and is a large sample test of Behavioral Theory of the Firm under China's unique conditions.

2. RESEARCH DESIGN

2.1 Model Development

The model used herein is based on Cyert and March's behavioral theory of the firm. Bowman (1980) and other researchers wish to make causal statements but are dealing with strictly cross-sectional data. Their analyses usually associate variance in returns with average returns calculated using data from the same period, making it impossible to ascertain the determinants of risk taking and the impact of performance on risk taking. Both Singh (1986) and Woo (1987) argued that time series models incorporating lags were needed to test such relations more clearly. Following their suggestions, this research attempts to establish time series models to research the impact of performance on risk.

Cyert and March viewed firms as large systems of standard operating procedures. Managers in firms have both levels of performance they aspire to (aspirations) and levels of performance they expect (expectations). If expectations fall below aspirations, managers search for solutions that can raise expected performance to the aspirations level, and if they cannot find such solutions, they lower aspirations.

Following the behavioral theory of the firm, the current model includes four basic variables: performance, aspirations, expectations, and risk. The model of risk taking in this research is :

$$\text{Risk}_{t+1} = b_0 + b_1 \text{performance}_t + b_2 \text{industry performance}_t + b_3 \text{expectations}_t + b_4 \text{aspirations}_t + b_5 \text{risk}_t + e,$$

where

b_i = parameters to be estimated,

t = year,

and

e = error term.

2.2 Hypotheses

Performance. The direct impact of performance on risk taking is central to work by Bowman (1980, 1982, 1984) and by Fiegenbaum and Thomas (1985, 1986, 1988) and was significant in Singh's (1986) research. Fisher and Hall (1969) presented an economic argument for the impact

of performance on risk taking: If the utility to a firm of each additional dollar in profits is slightly less than the utility of a previously gained profit dollar (declining marginal utility of income), the expected utility of an investment will decline with increases in the variance of returns for that investment will decline with increases in the variance of returns for that investment. For a high-variance investment to have equivalent utility to a low-variance investment, the high-variance investment would need to show higher mean performance. Fisher and Hall concluded that "this implies that earnings should be larger, on the average, for firms with greater variation in their earnings than for firms with little earnings variability" (1962, p.82). At the same time, some empirical research in China also found that China's listed companies' risk-return association presented significant negative (Zhu, 2008; Zeng, 2011; Zeng, 2008).

Hypothesis 1: Performance has a negative influence on risk ($b_1 < 0$)

Industry performance It is hypothesized by industry performance will have a negative influence on risk. The argument parallels that for individual companies. If low performance results in firms taking risky actions, an industry that on the average has low performance will be populated with firms taking risky actions. If competitors are taking risky actions, such as introducing new technologies and new products, a firm of interest will be forced to take such actions to keep up, even if its performance level is high.

Consider, for example, a high-profit firm in a low-profit industry, in which the introduction of new products is the main area of competition. Most firms in the industry are making low profits and consequently take risks by introducing new products. The high-profit firm will be under pressure to match the competitive moves of the other firms in the industry and so will also take risks by introducing new products. Thus, low industry performance should increase risk taking by the firms in an industry over and above the influence of a firm's own performance level.

Hypothesis 2: Average industry performance has a negative influence on risk ($b_2 < 0$)

Aspirations and Expectations Cyert and March (1963), March and Shapira (1987) suggested that if a firm aspires to a higher level of performance than it expects to attain under the status quo, it looks for ways to raise its performance. Given the role of routines in increasing predictability (March & Simon, 1958), it is likely that some of the changes to routines occasioned by attempts to increase performance will reduce organizational predictability. Such reductions should increase uncertainty with respect to the outcomes the organization may incur and may in particular increase income stream uncertainty. In an examination of players' responses to a strategic marketing game, Lant and Montgomery (1987) found that performance below aspirations resulted in riskier choices and more innovative search than performance

that met or exceeded aspirations. Although Lant and Montgomery used actual performance to predict risk, I followed the behavioral theory of the firm and used expected performance. Doing so allowed differentiation between the direct effects of performance on risk taking and the effects of the aspirations-expectations process. The income stream of a firm that makes few changes should be more predictable-less risky-than the income stream of a firm that makes many changes. Thus, the level of aspirations should have a positive influence on risk taking, and expectations should have a negative influence.

Similar hypotheses can be based on prospect theory (Kahneman & Tversky, 1979). According to that theory, the level of a firm's aspirations serves as a target or reference level; firms that anticipate returns below that level will be risk taking, and those that anticipate returns above it will be risk avoiding. Thus, increases in aspirations (the target) will be associated with increases in risk taking, and increases in expectations (anticipated returns) will be associated with decreases in risk taking.

Because the sources of the data on aspirations and expectations used here differed, the scales on which they were measured may not be identical. Consequently, in this research the difference between aspirations and expectations could not be usefully calculated. But if risk is a function of aspirations minus expectations, aspirations should have a positive influence on risk and expectations a negative influence.

Hypothesis 3: Expectations have a negative influence on risk ($b_3 < 0$)

Hypothesis 4: Aspirations have a positive influence on risk ($b_4 > 0$)

Finally, the model includes past risk to control for firm-specific historical influences on risk.

2.3 Measurement

2.3.1 Measuring Risk

Previous studies of risk-return relations have defined risk as the unpredictability of a firm's income stream (Bowman, 1980; Conrad & Plotkin, 1968; Fiegenbaum & Thomas, 1985; Fisher & Hall, 1969). These studies have measured risk by ex post, or actual, variance of a firm's return on investment or equity.

In this research, risk was measured as the ex ante uncertainty of a firm's earnings stream. Conventional measures of income stream risk, such as the variance in a firm's return on assets (ROA) or ROE, PE ratio and the variance of ROA or ROE, PE ratio around a time trend, measure ex post uncertainty, which may differ substantially from the uncertainty occurring before the time period. Ex ante measures of risk may be preferable to ex post measures (Bowman, 1982; Silhan & Thomas, 1986). If a number of analysts forecast the earnings of a given corporation, the variance in their forecasts should be strongly associated with the ex ante uncertainty of that earnings stream. Extensive research on capital markets has used the divergence of analysts' forecasts as a measure

of uncertainty (e.g., Brown, Richardson, & Schwager, 1987; Givoly & Lakonishok, 1988; Imhoff & Lobo, 1987). Further, Conroy and Harris (1987) provided results supporting use of this measure. In China, Zhu (2008) and Zeng (2011) also pointed out that use of this measure may be more accurate than conventional variance measures and ordinal measures. Bromiley (1991) pointed that use of ROA, ROE and PE as measures can get the same conclusion. So, this research select securities analysts forecast of PE ratio to measure risk. The data used herein comes from WIND.

2.3.2 Other Measures

Bromiley and other scholars found that use of ROA, ROE or ROS as measures of corporate performance can reach the same conclusion. So, this research use ROE as measure of performance and industry average ROE as measure of industry performance.

Expectations were measured by the mean of the PE ratio forecasts produced by securities analysts. A substantial body of literature indicates that such forecasts not only predict earnings reasonably well, but also contain new information that the stock market has not previously considered (e.g., Hassell & Jennings, 1986; O'Brien, 1988). Management and analysts' forecasts correlated .90 in the data described in McNichols (1989) and .97 in the data described in Hassell and Jennings (1986). Thus, analysts' forecasts correlate sufficiently highly with those of management to be considered a reasonable proxy.

This research considers that different companies should select different proxies to measure aspirations. Based on reviewing previous research, it can be concluded that there are two main factors influencing aspirations: past performance and average industry performance. March and Simon (1958) argued that past performance and comparison to the performance of others will strongly influence aspiration levels. Other researchers (e.g., Cyert & March, 1963; Lant & Montgomery, 1987; Levinthal & March, 1981; March, 1988) have modeled aspirations as a function of difference between previous aspiration levels and previous performance. Eliasson (1976) noted that corporations raise targets to slightly above their previous performance level. The performance of other companies should also influence aspiration levels. Fiegenbaum and Thomas (1988) and Lev (1974) argued that average performance forms a target level for firms in an industry. Herriott, Levinthal, and March (1985) modeled aspirations as a function of both past performance and the average performance of comparable firms. A firm that performs well below industry norms is hardly likely to aspire to continued below-average performance. A firm that performs above industry norms will not aspire to average performance.

In conclusion, the measure of aspirations used here combines past performance and average industry performance. For firms with performance above the mean for their industry, I presented aspirations by multiplying

past performance (ROA) by 1.05. For firms performing below their industry's mean, I set aspirations equal to that level of performance. Thus, I assumed that firms performing below their industry's average aspire to the average and firms performing above it aspire to improve their current position. This measure which conforms to the theoretical propositions justifying it and is related to previously used measures, appears to be reasonable and has been empirically validated in Bromiley's (1991) research.

3. RESULTS

3.1 Data and Sample Selection

According to China Securities Regulatory Commission's industry classification standard, this research selects our country's electricity, heat production and supply industry as our research sample. The reasons of the selection are as follows: (a) Electricity industry is a basic industry in

supporting national economy and social development and public utilities, which is of great significance to the development of national economy and has important influence on it. (b) Listed companies in electricity industry own earlier time-to-market and more mature development, so it is available to obtain more complete financial data so as to meet the requirement of this research. This research selects listed companies' financial time series data from 2004 to 2012 year and the data come from WIND and CSMAR. Based on research's need, this research eliminated some companies with missing annual data. The final data covered 26 listed companies in China. This research uses SPSS software to conduct regression analysis on the model.

3.2 Descriptive Analyses

Table 1 presents the summary statistics. Means, standard deviations, minimal values and maximal values are reported in Table 1.

Table 1
Summary Statistics

	N	Minimal value	Maximal value	Mean	Standard Deviation
Risk _{t+1}	142	0.30	1401.58	31.822 9	132.832 18
Performance _t	144	-0.43	0.39	0.078 8	0.088 32
Industry performance _t	144	-0.22	0.07	-0.009 8	0.103 85
Expectations _t	144	-313.13	4171.31	58.661 7	360.526 79
Aspirations _t	144	-0.04	0.41	0.092 7	0.065 10
Risk _t	144	0.15	8317.95	86.851 3	702.628 99
Effective N	142				

Risk_{t+1} is the risk of the firm for t+1 year that is the standard deviation of securities analyst forecast PE ratio of the firm for t+1 year. Performance_t is the performance of the firm for t year that is the (ROE) A of the firm for t year. Industry performance_t is the average performance of the industry for t year. Industry performance_t is the forecast performance of the firm for t year that is equal to securities analyst forecast PE ratio of the firm for t year. Aspirations_t is the performance that the firm aspired to for t year. For firms with performance above the mean for their industry, aspirations_t is equal to past performance (ROA) multiplying

1.05. For firms performing below their industry's mean, aspirations_t is equal to that level of performance. Risk_t is the risk of the firm for t year that is the standard deviation of securities analyst forecast PE ratio of the firm for t year. The data in Table 1 come from WIND and CSMAR.

3.3 Empirical Analyses

Table 2 and Table 3 present the results of goodness-of-fit test of the model and F test. By the numbers in the table it can be concluded that the model has good fitting and passes through F test under the significance level of 1 %.

Table 2

Model	R	R ²	Adjusted R ²	The standard estimate error
1	.666 ^a	.444	.424	100.851

a. predictive variable: (constant), Risk_t, Performance_t, Aspirations_t, Industry performance_t, Expectations_t

Table 3
Anova^b

Model	Sum of Squares	df	Mean square	F	Sig.
1 Regression	1 104 603.183	5	220 920.637	21.721	.000 ^a
Residual error	1 383 255.381	136	10 170.995		
Aggregate	2 487 858.564	141			

a. predictive variable: (constant), Risk_t, Performance_t, Aspirations_t, Industry performance_t, Expectations_t

b. The dependent variable: Risk_{t+1}

Table 4 presents the regression results of the model. By the coefficients in table 4 it can be concluded that hypothesis 1 is supported. Corporate past performance (Performance_t) has a negative impact on risk taking and significant at 0.1 percent level ($r = -1974.926, p < 0.001$). It is consistent with many western early research results (Bowman, 1982; Singh, 1986) and conforms to Bowman's concept of "risk seeking by troubled firms" (Bowman, 1982, p.33). Meanwhile, Fiegenbaum and Thomas (1988) found that low performers seek risk while high performers avoid risk. In China, Zeng (2008) and Zeng (2011) also both found that the risk-return association of Chinese listed companies presented negative at significant levels. However, it has some differences with this research. Zeng (2011) found that risk taking was the reason while the performance was the result. But this research found that the performance was the reason while risk taking was the reason. Zeng (2011) pointed that the use of correlation analysis in his research was rough. Further research needs to use multivariate regression model or structured model to explore the risk-return relationship deeper. So, this research remedies this defect by establishing multivariate regression model and using multiple regression analysis method to test the sample. This research speculates that it may be the reason that leads to the difference between this research and Zeng (2011) research.

Then, why do low performers have the tendency of take risk? Zeng (2008) responded to it as follows: (a) The management has unrealistic subjective desire; (b) The management's moral hazard risk plays a role in it. This research considers that in addition to the above two reasons, the corporate governance level may be another reason. The firm's return (performance) may be positively associated with its corporate governance level, that is to say, the higher the corporate governance level is, the more return it gets and vice versa (Zeng, 2010). So, the firm's low performance means that its internal and external governance have some problems. The lack of effective corporate governance may lead to the lack of necessary incentive and supervision of the enterprise management and intensify the management's moral hazard risk. Therefore, the firm may take excessive risks.

The coefficient of average industry performance (Industry performance_t) is -70.093 and its sig. value is

0.408, which suggests the hypothesis 2 is not supported. It means that in our country's electricity, heat production and supply industry, average industry performance has no direct impact on single enterprise. It is different with western research results (Bromiley, 1991). This research infers that the difference may be caused by different nature of sample industries and different national conditions. Our country's electricity, heat production and supply industry belongs to monopolized industry, which has low degree of competition and high industrial concentration. In the industry with higher degree of monopoly and industrial concentration, the firm can use its dominance of market and suppliers to obtain excess profits, so it has less risk from its competitors in the same industry (Zeng & Liu, 2008). Therefore, low performance can not force the single firm in monopolized industry to match the competitive moves of the other firms in the industry. It is why average industry performance has no direct impact on single enterprise in our country's electricity, heat production and supply industry.

Contrary to hypothesis 3, expected performance (Expectations_t) has a positive impact on risk taking ($r = 0.250, p < 0.5$). It means that the higher expected performance our country's firm gets, the more likely it is to take risks. This conclusion is not consistent with the forecast of the behavior theory of the firm and prospect theory, but it conforms to western empirical research. An empirical analysis once pointed that if corporate past performance is controlled and considered as a constant, those firms with high expected performance will take additional risks (Bromiley, 1991).

Hypothesis 4 is supported, namely Aspirations_t has a significant positive impact on risk taking ($r = 1934.594, p < 0.001$). It means that a firm's risk taking is influenced by its aspirations. The higher performance the firm aspires to, the greater its risk tendency is. This is consistent with the forecast of the behavior theory of the firm and prospect theory: If a firm's aspirations is higher, which exceeds its expectations, it will seek every possible way to improve its performance, such as introducing new products and developing new technology and so on. So it is more likely for the firm to be attracted by some risky investment opportunities and show stronger risk tendency or take more risky behavior.

Table 4
Coefficients

Model	Unstandardized coefficients		Standardized coefficients		
	B	Standard errors		t	Sig.
1 (Constant)	3.423	16.996		.201	.841
Performance _t	-1974.926	203.198	-1.321	-9.719	.000
Industry performance _t	-70.093	84.426	-.055	-.830	.408
Expectations _t	.250	.126	.684	1.986	.049
Aspirations _t	1934.594	285.799	.952	6.769	.000
Risk _t	-.127	.065	-.679	-1.973	.049

a. The dependent variable: Risk_{t+1}

The coefficient of Risk τ is -0.127 and its sig. value is 0.049, namely it is significant at 5 percent level. It means that the past risk of companies in our country also has a negative impact on risk taking. It may be explained as follows: with the rapid development of market economy and enterprises in our country in recent years, market supervision system and the company governance structure gradually tend to be perfect. Under these conditions, if a firm took greater risks in the past, its management will be under pressure from board of directors or under the supervision of China Securities Regulatory Commission, so it will take the initiative to reduce its risk in the future.

CONCLUSIONS

From the model's regression results, it can be concluded that the risk model in this research is validated. Except that the industry performance has no significant impact on risk taking, other factors including past performance, expectations, aspirations and past risk all have significant positive or negative impact on risk taking. And, the model differentiates between the impact of performance on risk taking and the impact of aspirations-expectations on risk taking. In China, listed companies' association between risk and performance presents negative, supporting the firm behavior theory's causal reasoning on risk-return relationship. However, expectations has a positive impact on risk taking, which is different with the behavior theory of the firm.

This research's empirical results illustrates that high risk does not necessarily associated with high returns. Low performers may take more risks while high performers may take less risks. Bowman's paradox also exists in our country's enterprises. Because low performance leads to high risk, which makes the firm fall into a vicious cycle of low return-high risk, the corporate management and dominant stockholders in our country should strive to improve the firm's performance and carry out risk management through the firm's strategic decision and daily operations, so that the firm owns a good cycle of high return-low risk to promote its development.

This research has certain innovations. First, this research adopt the multivariate regression analysis method to empirically test the risk-performance relationship of enterprises in China. This is the first time for strategic management in China to use multiple regression model to conduct an empirical research on the risk-return relationship. Second, the behavior theory of the firm underlies the model tested and this research can be seen as a large sample test of that theory in China. Third, this research uses the securities analysts' forecast returns standard deviation to measure risk, which is a new attempt to measure risk of our country's enterprises.

However, there are still some problems to deserve further research. This research only selects our country's

electricity, heat production and supply industry as the sample, so other industries' risk-return relationship deserve further research by scholars. Although the risk measure used in this research can be used for reference, different risk measures such as proxy variables and content analysis of annual reports can be used in further research. This research only reveals that the firm's low past performance will lead to risk taking. The impact of this risk on future performance deserves future research.

REFERENCES

- Andersen, T. J., Denrell, J., & Bettis, R. A. (2007). Strategic responsiveness and Bowman's risk-return paradox. *Strategic Management Journal*, 28(4), 407-429.
- Bowman, E. H. (1980). A risk/return paradox for strategic management. *Sloan Management Review*, 21(3), 17-31.
- Bowman, E. H. (1982). Risk seeking by troubled firms. *Sloan Management Review*, 23(4), 33-42.
- Bromiley, P. (1991). Testing a causal model of corporate risk taking and performance. *Academy of Management Journal*, 34(1), 37-59.
- Brown, L. D., Richardson, G. D., & Schwager, S. J. (1987). An information interpretation of financial analyst superiority in forecasting earnings (Working paper). State University of New York at Buffalo.
- Chang, Y., & Thomas, H. (1989). The impact of diversification strategy on risk-return performance. *Strategic Management Journal*, 10, 271-284.
- Conroy, R., & Harris, R. (1987). Consensus forecasts of corporate earnings: Analysts' forecasts and time series methods. *Management Science*, 33, 725-738.
- Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.
- Deephouse, D. L., & Wiseman, R. M. (2000). Comparing alternative explanations for accounting risk-return relations. *Journal of Economic Behavior and Organization*, 42, 463-482.
- Denrell, J. (2008). Organizational risk taking: Adaptation versus variable risk preferences. *Industrial and Corporate Change*, 17(3), 427-466.
- Fama, E. F., & MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy*, 81, 607-636.
- Eliasson, G. (1976). *Business economic planning*. London: John Wiley & Sons.
- Fiegenbaum, A., & Thomas, H. (1985). An examination of the structural stability of Bowman's risk-return paradox. *Academy of Management Proceedings*, 7-10.
- Fiegenbaum, A., & Thomas, H. (1988). Attitudes toward risk and the risk return paradox: Prospect theory explanations. *Academy of Management Journal*, 31(1), 85-106.
- Fiegenbaum, A., & Thomas, H. (1995). Strategic groups as reference groups: Theory, modeling and an empirical examination of industry and competitive strategy. *Strategic Management Journal*, 16(5), 461-476.

- Fisher, I. N., & Hall, G. R. (1969). Risk and corporate rates of return. *Quarterly Journal of Economics*, 83, 79-92.
- Givoly, D., & Lakonishok, J. (1988). Divergence of earnings expectations: The effect on stock market response to earnings signals. In E. Dimson (Ed.), *Stock market anomalies* (pp.272-289).
- Greve, H. R. (1998). Performance, aspirations and risky organizational change. *Administrative Science Quarterly*, 43, 58-86.
- Hassel, J. M., & Jennings, R. H. (1986). Relative forecast accuracy and the timing of earnings forecast announcements. *Accounting Review*, 61, 58-75.
- Henkel, J. (2009). The risk-return paradox for strategic management: Disentangling true and spurious effects. *Strategic Management Journal*, 30(3), 287-303.
- Herriott, S. R., Levinthal, D., & March, J. G. (1985). Learning from experience in organizations. *American Economic Review*, 75, 298-302.
- Imhoff, E. A., & Lobo, G. (1987). The impact of earnings forecast uncertainty on the information content of unexpected annual earnings (Working paper). University of Michigan, Ann Arbor.
- Johnson, H. J. (1992). The relationship between variability, distance from target and firm size: A test of prospect theory in the commercial banking industry. *Journal of Socio-Economics*, 21, 153-171.
- Kahneman, D., & Tversky, D. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica*, 47, 262-291.
- Kim, W. C., Hwang, P., & Burgers, W. P. (1993). Multinationals' diversification and the risk-return trade-off. *Strategic Management Journal*, 14, 275-286.
- Knight, F. H. (1921). *Risk, uncertainty and profitability*. New York: Harper & Row Press.
- Lant, T. K., & Montgomery, D. B. (1987). Learning from strategic success and failure. *Journal of Business Research*, 15, 503-517.
- Lev, B. (1974). On the association between operating leverage and risk. *Journal of Financial and Quantitative Analysis*, 9, 627-641.
- March, J., & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management Science*, 33(11), 1404-1418.
- March, J. G., & Simon, H. A. (1958). *Organizations*. New York: Wiley.
- McNichols, M. (1989). Evidence of informational asymmetries from management earnings forecasts and stock returns. *Accounting Review*, 64, 1-27.
- Nickel, M. N., & Rodriguez, M. C. (2002). A review of research on the negative accounting relationship between risk and return: Bowman's Paradox. *Omega*, 30(1), 1-18.
- O'Brien, P. C. (1988). Analysts' forecasts as earnings expectations. *Journal of Accounting and Economics*, 10, 53-83.
- Oviatt, B., & Bauerschmidt, A. (1991). Business risk and return: A test of simultaneous relationships. *Management Science*, 37(11), 1405-1423.
- Palmer, T. B., & Wiseman, R. M. (1999). Decoupling risk taking from income stream uncertainty: A holistic model of risk. *Strategic Management Journal*, 20, 1037-1062.
- Ruefli, T. W., Collins, J. M., & Lacugna, J. R. (1999). Risk measures in strategic management research: Auld Lang Syne. *Strategic Management Journal*, 20(2), 167-194.
- Silhan, P. A., & Thomas, H. (1986). Using simulated mergers to evaluate corporate diversification strategies. *Strategic Management Journal*, 7, 523-534.
- Singh, J. V. (1986). Performance, slack and risk taking in organizational decision making. *Academy of Management Journal*, 29(3), 562-585.
- Sinha, T. (1994). Prospect theory and risk return association: Another look. *Journal of Economic Behavior and Organization*, 24, 225-231.
- Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19, 425-442.
- Wiseman, R. M., & Gomez-Mejia, L. R. (1998). Risk and return in organizational decision making. *Academy of Management Journal*, 41(2), 330-333.
- Woo, C. (1987). Path analysis of the relationship between market share, business-level conduct and risk. *Strategic Management Journal*, 8, 149-168.