

Full Length Research Paper

Effective risk management and company's performance: Investment in innovations and intellectual capital using behavioral and practical approach

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Risk management is used to decrease the undesirable effects of market conditions and behavior on company's activities and performance. This research focuses on ability of risk management response to out of control market factors to facilitate consistent profitability that leads to improvement in company's performance. This is an empirical research that investigates the association of total risk management and company's performance. The results indicate positive and significant relationship between total risk management and company's performance in companies that have invested in research, development and innovations along with companies that have greater level of intellectual capital and industries that have rapid knowledge growth. The results confirm the findings of previous researches in terms of functional and practical behaviors approaches.

Key words: Total risk management, human capital, functional and behavioral approaches, innovation company's specific assets.

INTRODUCTION

Some factors that may cause companies to face various unpredictable risks are environmental complexity (Luo, 1999), intense competition (White and Frame, 2004), advanced technology (Baldwin and Li, 2002), development of information and communication technology, new methods of supplying goods and services, environmental issues and companies' movement from tangible to intangible assets. As a result, companies are faced with several risk management issues including enterprise risk management, business risk management and strategic risk management (Woods, 2009).

Currently, risk management is regarded as one of the most important concerns of executives and the risk management activities are expanding. However, regarding the peripheral effects and applications of risk management, few empirical researches has been done up until now. In other words despite rapid growth in

importance of the topic, few applied studies has been done to determine whether risk management has practically desirable effects on the firms performance.

On the other hand due to the conceptual complexities of risk management and variation in methods of controlling adverse effects of losses, the previous few attempts that have been made failed to offer a comprehensive and integrated framework.

Risk management has several advantages. It inspires strong stimulus in company's major stockholders to increase their investments in the company. By increasing their investments such investors invest in company's specific assets. These assets are regarded as tools that provide better business opportunities toward obtaining proper and long lasting competitive advantage. Therefore, it is concluded that lack of effective risk management may lead to imposition of extra costs on both investor and investee. By incurring excessive costs the performance of company is deteriorated. The previous mentioned issues are some of the indications of the influence of effective risk management on behavioral

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functions.

In some cases as environmental condition changes, some companies continuously earn higher return than others. As a result some questions that may arise are: what could be the reason behind such accomplishments? Is it effective risk management? How do the functional and behavioral consequences of risk management affect performance? How does risk management affect performance? This study aims to address these questions.

Contribution of this study is twofold. First, this paper attempts to develop a new concept of risk management. Risk management is defined as a tool that helps in dealing with external market risks that are out of management control. Risk management reduces variation of company's profit and profit consistency reduces the likelihood of financial distress, consequently reduces cost of capital.

As a result, company can invest in further feasible projects and proper business opportunities. So, this study contributes to the investor's knowledge through helping them to make better investment decisions. The remainder of this paper is organized as follows; literature review; theoretical framework; research hypotheses and description of the variables; research methodology; summary of data analysis and findings, and conclusion.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

The salient researches that have been done in risk management context and about consequences of risk management explained here.

Francis and Armstrong (2003) investigate the connection of ethics to risk management. They argue that there are compelling reasons for good ethical practice to be an essential part of risk management. They discuss that exploring the relationship of ethics and risk management has significant commercial outcomes. Not only those outcomes help to identify potential problems, but they also help preventing fraud, preserving corporate reputation, and to mitigate litigation against company which lead to increased legitimacy. Likewise, Bhimani (2009) say that risk management leads to higher corporate legitimacy.

Using a sample of Chinese firms, Mua et al. (2009) examine the effect of risk management strategy over performance of new product development. They find that risk management strategies that focus on technological, organizational, and marketing factors, individually and interactively improve the performance of new product development.

Gordon et al. (2009) examine the relation of enterprise risk management (ERM) and performance. They argue that the relation of enterprise risk management and performance is contingent upon five firm-specific factors

namely, environmental uncertainty, industry competition, firm complexity, firm size, and board of directors' monitoring. Finally they argue that for implementing ERM firms should pay attention to the contextual variables that are surrounding the firm.

Andersen (2008) examines the firm-specific investment rationale as a plausible explanation for positive risk management effects. As a consequence of the firm-specific investment rationale he finds that effective risk management outcomes are associated with superior corporate performance. Further he indicates that firms that vary in levels of intellectual capital and investment in innovation also differ in their risk management effects.

Likewise, Gupta (2011) examines the risk management in Indian companies and explore the reasons for the adoption or lack of adoption of integrated approach to risk management. He shows that even though effective risk management can improve organizational performance, companies do not have adequate infrastructure to implement enterprise wide risk management. He concludes that a sea change in risk perception is required to build up risk culture across business segments and incentivize risk management adoption.

Risk management definitions

Risk management is an effective technique for minimizing undesirable effects of risks and optimizing the benefits of risky situations (Essinger and Rosen, 1991).

Chapman and Ward (1997) describes the aim of risk management as process enhancement that is established through systematic identification, evaluation and mitigation of project risks. According to these definitions risk management is defined as measures that are taken to decrease the potential risky consequences of specific phenomenon namely price variation, accidents, political hazards, disruption in supply of raw material, economic development, etc. Such risks represent a wide spectrum of company's risks that are dealt with by various specialists. In other word, effective risk management deals with market risks that the company is facing and tries to take advantage of business opportunities that these risks might have. It is an effective tool of contending with external market threats that are out of management control and result in reduction of profit variances (AliBaba and VazirZanjani, 2009).

The tools and facilities that management uses to face external market threats are financial hedging, insurance contracts, management controls systems, transportation of resources and careful decisions that are made to improve company's profitability. All of the aforementioned movements are made to reduce adversity of situations that the company might face with.

Currently to cover the market risks, companies do risk management through derivatives via using insurance

coverage and through examining integrative risk management approaches. In addition, in comparison with past risk management motivations, and historical financial obligations, there is higher tendency to risk management now. Indeed, it is obvious that company's accountability depends to its ability to utilize the new opportunities that are derived from changes in environment.

Risk management and performance

When the company is able to prevent the undesirable effects of external risks and react to the environmental changes, it will be less sensitive to economic consequences of market variation. In other words, when the company effectively manages the risk, it successfully adapts to changes in environmental conditions and profit variation will be decreased (ParvizRad, 2002). According to previous discussion, the following three reasons clarify that better economic performances result from effective risk management. The three reasons will be discussed in subsequently.

- (1) Less average rate of capital expenditures (Andersen, 2008)
- (2) Higher cost of contracts
- (3) Increase in company's specific investment

Less average capital expenditures

Profit stability reduces company's business risk, increases repayment of debts and stabilizes going concern. Furthermore, when company benefit from low risk, it will access higher borrowing resources and pays less interest expenses.

From owners' point of view, when company decreases the risk of bankruptcy, the likeliness of reduction of paid in capital decreases and company would have higher expected future dividends.

On the other hand, less variation of projects' profitability may cause higher inducement of potential investors and consequently better availability of capital with less required rate of return. All these factors will lead to less average cost of capital from lenders and stockholders' equity. Also less financing costs will result in less interest expense and better economic performance.

In other words, higher availability of capital can lead to improvement of economic performance. The reason is that higher capital availability increases the available investment opportunities to the company.

Higher contract costs

Although, investors have reasonable chance of adjusting and updating their portfolios, but such possibility does not

exist for other company's stakeholders like customers and employees.

In addition, in small companies that hold small portion of capital market, there is little possibility for investors to change and update their investment portfolios. Because in such companies volume of stock supply will influence the stock price and may lead to excessive decrease of price and cause stockholders a heavy loss. Therefore, only stockholders of big companies are able to easily change their portfolios (Andersen, 2008).

If company does not pay enough attention to risk management, this will affect its relationship with stockholders and consequently harm business transactions. Company's counter parties like suppliers and customers demand higher premium for dealing with the company and this increases company's cost of commercial transactions.

For example, suppliers may require company to pay the cost of goods and services immediately or even in some situations the suppliers expect advance payment for goods and services that they offer. Furthermore, since employees think that the company is facing going concern problem, they are not fully committed to their jobs and spend some time in search of new job. Based on the discussion so far there are higher costs in companies that do not manage their risks properly.

Increase in company's specific assets

When companies' bankruptcy risk increases, major stockholders are not inclined to provide long-term commitment to company and will cut relations and resources that cause company's appreciation. This is while the company's specific assets are direct resources of activities that enhance company's profitability and appreciation. Hence, if capital is used for other goals, then company will lose potential opportunities (Wang and Reuer, 2006).

For instance, when company is unable to establish its past commitments in relation to other companies, resources should be spent to other activities. Effective risk management decreases the probability of occurrence of such conditions and lessens the imposition of losses on stockholders.

Therefore, risk management persuades stockholders to invest in companies specific assets. These resources include processes of producing specific products or using certain technologies in industries that use knowledge for productions and services. In addition, such investments that are caused by employees, suppliers, customers and partners are a kind of financial resource that are often rare and valuable and are basis for higher economic value and gaining competitive advantage.

Therefore, total risk management reduces bankruptcy risk and decreases risk of company's commitment to customers, suppliers, partners, managers, employees,

etc. this lower risk will motivate institutional investors to invest in companies specific assets that provide long-term value for company.

Functional and performance behaviors

Rezayian (2005) believes that the behavior is a set of activities that can be observed through performances and actions. Behavior management is an important issue in the management literature that is considered by managers in administering affairs.

Rahnamaye et al. (2007) believe that risk is a probability of deviation of reported return from expected return that is derived from business objectives. Thus, to increase the efficacy that is frequency of achieving predefined objectives, doing proper management seems necessary. If the consequences of management's behaviors and actions that are normally evident in performance could be identified during decision-making process, then risk management quality would be plausible. Meanwhile one of the salient methods through which consequences of management's behavior can be identified during decision making process is considering innovation. As a result innovation is very important in risk management. Therefore, from the theoretical perspective, the connection between effective risk management and performance, as representative for functional and practical behavior, with regard to investment in innovation and intellectual capital would be justifiable.

Knowledge, innovation and human capital

Company's weak reaction to external risks reinforces likeliness of bankruptcy. Having such bankruptcy's prospect in mind, major potential stockholders avoid investing in companies' assets that are useful for innovativeness along with company's development and progress.

However effective risk management increases major stockholders tendency to make long-term commitments. Such commitments are important for company's valuation (Hoyt and Liebenberg, 2008). Thus, the first hypothesis is as follows:

H₁: There is a meaningful relationship between total risk management and the company's performance level.

The topic of combining different knowledge to obtain higher profit is considered as ability of company to combine its knowledge with other company's knowledge and global knowledge management.

Therefore, innovative companies who perform in industries with high knowledge like the computer production or service industries are more concentrated on advanced technology and have higher dependence on

development of company's specific resources.

Furthermore, innovative business environments include industries with automatic technologies like computer industries, measurement tool industries and pharmaceutical companies. However, reliance on advanced technology relates to specific assets of companies whose stockholders are sure about usage of knowledge in interaction with customers, suppliers, partners, managers and employees.

Moreover, knowledge based professional activities and services like auditing, consultancy, engineering, planning, and software processing, need proper investments in companies that support innovative behaviors and produce suitable and long lasting competitive advantage. Accordingly, innovation brings about new products, modern services and processes and introduces constructive methods of doing business in organization. Continuous consideration to innovation will cause commitment to research and development. Such commitment depends on incentive of major stockholders and their motivation to invest in specific and unique assets.

Innovation is calculated as R and D costs occurred for new products and services divided by total net sales. This ratio is an independent variable in second hypotheses. Indeed, innovation is an attempt to develop new business opportunities that generates a platform for competitive advantage (Andersen, 2008). In addition, investment in innovation provides diverse business opportunities and boosts company's flexibility (Chen and Xie, 2004). Thus, the second hypothesis is as follows:

H₂: there is a higher positive relationship between total risk management and the company's performance level in companies that are investing in innovations.

By developing and using specific, valuable, rare, unique and sustainable resources, companies can improve performance and have durable competitive advantage. Such competitive advantage depends on specific investment that use innovations and do activities in industries that have high growth and high knowledge which are supported by human capital (Cohen and Kaimenakis, 2007).

Obviously, the difference of the market and book value is essentially caused by human capital potential value and its outcomes (Milost, 2007). Market-book ratio is market value of outstanding stocks divided by the book value of the firm and represents the effects of risk management performance in the company, which is namely based on human intellectual capital. Intellectual capital could make large differences between market and book value of assets and it is affected by future value of the creative power of human knowledge.

As a result, in order to identify valuable and suitable resources of business, the company should have human capital and knowledge as necessary precondition. In fact

Table 1. Description of variables.

| Variable | Type (IV, DV or CV) | Description |
|-----------------------|---------------------|---|
| Total risk management | Independent | Standard deviation of annual net sales over the standard deviation of economic returns |
| Performance | Dependent | Net income (loss) divided by either average total assets or sum of equity and long-term debts |
| Innovation | Independent | R and D expenditures over net sales |
| Market-book ratio | Independent | Market value of outstanding stocks divided by book value of firm |
| Firm size | Control | Logarithm of total assets |
| Financial leverage | Control | Long-term debt over total equity |

the human capitals that are developed by communication initiate new ideas, and bring new paths to light that arrange market conditions (Boekestein, 2006).

Therefore, effective risk management could encourage major stockholders to invest in company's assets that earn higher benefits. In addition, higher value that high growth companies and human capital based companies give to innovation in company's assets is because of effectiveness of total risk management (Manuel, 2007), especially for the companies that are performing in active business environment.

Thus the third hypothesis is defined as follows:

H₃: there is a higher positive relationship between total risk management and the company's performance level in companies that have higher level of intellectual capital.

In this research the relationship between total risk management and the company's performance level has been investigated. Total risk management is calculated as standard deviation of annual net sales divided by the standard deviation of economic returns (ROA and ROI) and is averaged for 6 years. This ratio is independent variable in research hypotheses analysis. Since two different ratios were used for measuring corporate performance level, each hypothesis is tested separately with two different ratios of company performance (ROA and ROI). Table 1 **Error! Reference source not found.** indicates the summary of variables used in this study.

RESEARCH METHODOLOGY

This research is exploratory-survey research that uses bivariate regression for testing the hypotheses. 6-year average level of performance for ROA and ROI ratios as dependent variables and total risk management, innovation and market-book ratios as independent variables and firm size and financial leverage are considered as control variables. Firm size is natural logarithm of total assets and is included in the regression analyses as a control variable.

Samples were selected from companies listed in Tehran Stock Exchange during 2003 to 2008. The relevant data had been collected from the companies' financial statements and notes.

Purposeful sampling is used for choosing samples. Companies that had following features are selected:

- Financial statements and notes are available in the years of 2003 to 2008.
- Information about stock market prices of companies is available during 2003 to 2008.
- They have R and D costs in the notes of their financial statements.

Therefore, after reviewing the information of all the companies listed on TSE, only 52 companies from 13 different industries were selected.

Methods of data analysis and hypothesis testing

Testing hypotheses in this study is as follows: in the first hypothesis the correlation between company's performance level (dependent variable) and total risk management (independent variable) will be examined, then in the second and third hypotheses, these two variables will be tested in presence of innovation (represented by research and development costs) and intellectual capital (represented by market-book ratio), respectively.

Firm size that is measured by total assets may affect risk management capabilities and company's performance level. Indeed, the companies selected for this study have not the same total assets. Financial leverage that may be influenced by particulars of the industries in which the firm operates have effect on business risk and due to differences in the rate of long-term debt by which the company is financed, two control variables; namely firm size and financial leverage were used in bivariate regression analysis. Financial leverage affects business risk and is considered as a general risk management tool that affects risk management effectiveness and performance. In fact, since taking a long-term debt is one way of financing, firms always encounter risk of not being able to pay their debt and interest on maturity date. Thus, the more company has long term debt; the business risk is higher. Financial leverage is measured as long-term debt over total equity and was included as a control variable in the regression analyses. It should be noticed that company's performance level variable will be tested separately in three research hypotheses with ROA and ROI ratios.

HYPOTHESES ANALYSIS AND FINDINGS

Linear regressions were used to test the hypotheses. The

Table 2. The results of testing variables.

| Hypothesis | ANOVA result | Regression model | Variable | R2 (%) |
|---|------------------------------------|--|--|--------|
| First hypothesis with total risk management (Risk ROA) and performance level (ROA) | There is a meaningful relationship | $y = 0.456x + 0.111$ | y = performance level; x = total risk management | 19 |
| First hypothesis with total risk management (Risk ROI) and performance level (ROI) | There is a meaningful relationship | $y = 0.422x + 0.176$ | y = performance level; x = total risk management | 16 |
| Second hypothesis with total risk management (Risk ROA) and performance level (ROA) | There is a meaningful relationship | $y = 0.434x_1 + 0.293x_2 + 0.08$ | y = performance level; x ₁ = total risk management; x ₂ = innovations | 26 |
| Second hypothesis with total risk management (Risk ROI) and performance level (ROI) | There is a meaningful relationship | $y = 0.422x + 0.176$ | y = performance level; x = total risk management | 16 |
| Third hypothesis with total risk management (Risk ROA) and performance level (ROA) | There is a meaningful relationship | $y = 0.379x_1 + 0.461x_2 - 0.258x_3 + 0.089$ | y = performance level; x ₁ = total risk management; x ₂ = intellectual capital; x ₃ = financial leverage | 39 |
| Third hypothesis with total risk management (Risk ROI) and performance level (ROI) | There is a meaningful relationship | $y = 0.418x_1 + 0.269x_2 + 0.109$ | y = performance level; x ₁ = total risk management; x ₂ = intellectual capital | 21 |

results showed a significant correlation between total risk management and company's performance. However, since the R² in the second and third hypotheses (by applying innovations and intellectual capital) is higher than R² in the first hypothesis (which is regardless of innovation and intellectual capital), it has been concluded that investing on innovation and intellectual capital may improve company's performance. The results of testing hypotheses are presented in Table 2.

Conclusion

In this research, the relationship between total risk management and the company's performance level is investigated. First, the results of hypotheses testing shows that there is a significant positive relationship between performance level as a behavioral function and total risk management. If companies try to control unfavorable conditions that result from exposure to risk, they can improve corporate performance.

Second, if companies invest in intellectual capital and extend or create certain valuable, rare, unique and unchangeable resources, they will have better performance and can benefit from competitive advantage. Naturally, such investment requires extensive investment in specific resources for companies that have used innovation and engaged in business activities especially

in industries that have high growth levels and such growth level is supported by human intellectual capital. In other words, the results showed that there is significant positive relationship between functional behavior of management that is considered as their performance indicators and the total risk management that indicates activities and behaviors of directors. If management considers innovation and invention in their activities, the company will certainly have higher levels of knowledge and level of human intellectual capital will be improved.

Results show the effect of investment in innovations, research and development and intellectual capital on corporate performance levels. Therefore, the results notify managers of the importance of managing all kinds of risks that company may face with. The results also show that more investment in this field would improve corporate performance level, stabilize the profitability and give more confidence to major investors to invest their resources in company. Finally, due to the impact of total risk management on company performance, functional behaviors of management should be considered in investors' decision making.

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