Available online www.jocpr.com

Journal of Chemical and Pharmaceutical Research, 2014, 6(3):616-621

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Study on audit of corporate financial risk based on FMEA method

Tong Yanjun

Neijiang Normal University, Neijiang, Sichuan, China

ABSTRACT

FMEA was originally designed and applied as a preventative fault evaluation method for industrial quality management. In over 60 years, it has undergone considerable development and wide application. The thesis applies the FMEA (Failure Modes and Effects Analysis) in the audit of corporate financial risk according to the design ideas and evaluation method of FMEA and on the basis of corporate financial risk management and FMEA, and has obtained very good achievements. The risk evaluation mode for audit of corporate financial risk based on FMEA is obtained through analysis of product FMEA risk evaluation technology in accordance with the characteristics and requirements of financial risk audit. The empirical study shows that the application of FMEA in the audit of corporate financial risk can effectively achieve the purpose of prevention in advance, reduce risk, and improve the scientificity and effectiveness of audit results.

Key words: FMEA; Corporate Finance; Risk Audit

INTRODUCTION

Financial risk refers to a variety of unpredictable and uncontrollable factors in the financial activities of a company that make the final financial results of a company obtained in a certain period and range deviated from business objectives, thus forming the possibility of economic losses or more gains of the company. Financial activities of a company exist in the entire process of production and management. Financing, short and long term investment, distribution of profits and so on may generate risks. Audit of corporate financial risk is a series of processes ranging from identification of to analysis of and even to countermeasures for corporate financial risks utilizing the basic theories and methods of risk management in the process of audit. In order to prevent and analyze corporate financial risks, it is required to find out effective corporate financial risk management method to achieve the purpose of risk prevention and avoidance. Many studies have shown that the FMEA method is used in risk management, for example, Shi Liping et al (2010) discussed the emergency management issues of FMEA in safety production; Xu Ping et al (2007) considered the application and limitations of FMEA in medical risk management; Shen Yanan et al (2007) discussed the screening of substantive test items based on FMEA and Taguchi check and design method; Lilu Wen (2004) used FMEA idea to analyze the potential risks of purchase in the low cost area; Luan Hongdong (2008) discussed the application of FMEA in IT project management. The thesis will attempt to construct a set of simple and practical audit models for identification, evaluation and risk control of corporate financial risks on the basis of studies conducted by predecessors and the characteristics of FMEA in respect of prevention prior to losing efficacy as well as the modern theories and technologies of audit of corporate financial risks, for reference in risk audit. Studies have shown that the application of product FMEA in audit of corporate financial risk can effectively utilize the characteristic of FMEA of prevention in advance to evaluate and analyze various possible risks and can reduce corporate financial risks to the greatest extent and improve the safety and effectiveness of corporate financial activities, thus reducing costs and obtaining better results.

2. EFFECTIVENESS OF FMEA METHOD FOR THE AUDIT OF CORPORATE FINANCIAL RISK

Failure Modes and Effects Analysis (FMEA) is a preventive risk control method originated from the early 1950s. [1]Up to now, it has developed into a set of scientific and complete analysis method in practice. FMEA, i.e. Failure

Modes and Effects Analysis, analyzes a potential failure mode in industrial system, thus to determine its impact on the entire system and the degree of impact, and further identifies the weak sections and key parts in the system and provides basis in respect of quantity analysis for further improving the reliability of the system. FMEA is in fact a set of rigorous identification, control and improvement management process for "preventive measures"; [2] it can not only be used in the auto parts industry but also used in the industry in which potential problems are expected to be strictly controlled. Our country has also developed national standard Failure Modes and Effects Analysis (FMEA) Procedures for System Reliability Analysis Technology. At present, the technological development has been developed very rapidly and widely applied in such fields as aerospace, nuclear industry and automotive, machinery, electronics, ships and so on. FMEA method conduct systematic analysis of various works in respect of corporate finance, identifies potential failure mode, conducts quantitative analysis of risk factors, and take measures for risk control in all the stages of corporate financial activities. The risk control thought reflected by the FMEA theoretical method provides beneficiary theoretical reference and technical guidance for the construction of audit mode for corporate financial risks. The specific process is shown in Figure 1.

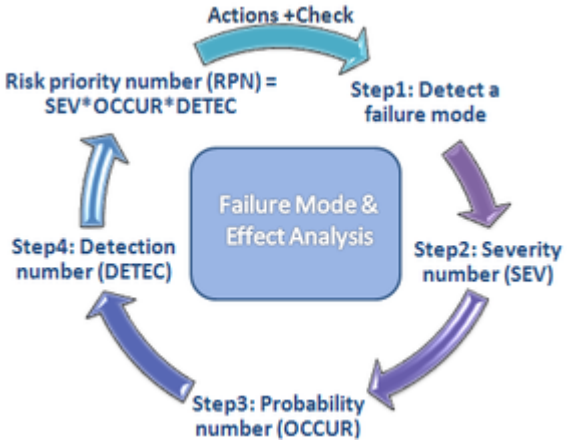

Fig. 1: FMEA Flow Chart

The risk level of corporate finance work is represented by the risk priority number. Risk priority number (RPN) = Severity (S) × Occurrence degree (O) × Detection degree (D). Severity refers to the impact of a risk on corporate finance. The impact degree values, i.e. 1 to 5, are in the order from light to serious. Occurrence degree refers to the possibility of a risk. The lowest degree is represented by 1 and the highest degree is represented by 5. Detection degree refers to the difficulty of detecting a risk. Easy detection degree scores 1 and difficult detection degree scores 5. The larger RPN is, the larger the risk is. The risk degree of corporate finance can be determined based on RPN value. [3]

In the audit of corporate financial risk, it is required to firstly conduct Work Breakdown Structure (WBS) [4]for corporate finance and then conduct audit for the decomposed corporate finance in accordance with relevant laws and regulations. The specific audit includes the following contents: firstly, it is required to identify the possible risks of corporate finance to find out the risks and major factors causing risks and make a qualitative analysis for the impact of risk factors; secondly, it is required to evaluate corporate financial risk. It means to establish a problem analysis model on the basis of identification in the earlier stage, conduct a qualitative analysis for the impact of risk factors, and calculate the probability of various risks and the losses that may be caused, providing scientific basis for control of these risks; finally, it is to analyze the available resources, propose risk countermeasures and provide monitoring and control of risks to let various risk factors controlled in accordance with the results of qualitative analysis of risk. FMEA theory enriches the connotation of corporate financial risk and also shows the direction for audit of corporate financial risk and provides theoretical and methodological guidance for the audit model for corporate financial risk control. [5]

3. CONSTRUCTION AND APPLICATION OF AUDIT MODEL FOR CORPORATE FINANCIAL RISK CONTROL BASED ON FMEA METHOD

The thesis has constructed an audit model for corporate financial risk control based on FMEA method. The working process is shown in Figure 2. [6]

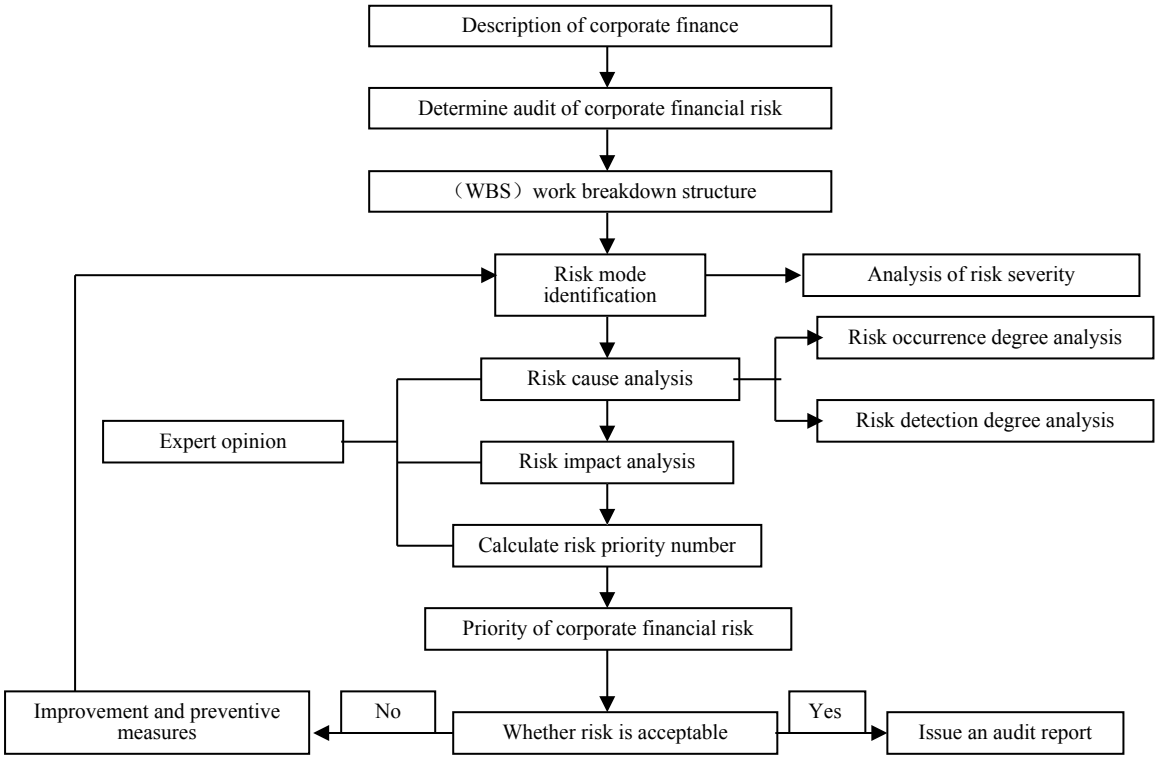

Fig. 2: Flow Diagram of Audit of Corporate Financial Risk based on FMEA

3.1. RISK MODE IDENTIFICATION

Risk mode identification is to identify the possible risk modes that may occur in each work in the process of corporate financial activities. Generally, the risk factors affecting corporate financial activities are also diverse. There are corporate external reasons and corporate internal reasons, and the reasons for the formation of different financial risks are different. The internal reasons mainly include improper financing scale strategy, improper capital source structure, improper way of financing and time selection, improper deal on credit strategy, and improper financing sequence arrangement. External reasons mainly include market risk, changes in interest rate, and price risk. [7]

In application of FEMA method for identification of corporate financial risk mode, scientific modeling and computational analysis can predict and analyze the possible risks with corporate finance. In risk identification, it is required to first determine the scope of corporate finance activities, and then for the specific items after breakdown, the auditors of different disciplines with different knowledge structures, experience and background should collaborate with each other and apply Delphi method or brainstorming method to conduct comprehensive assessment and analysis for the risk of audit objects. Finally, it is required to analyze the possible consequences and severity of each risk mode. Generally, the grading method is applied for description. The scoring standard (5-score system is applied) is shown in Table 1. [8]

Table 1: Severity Scores of Corporate Financial Risk

Risk severity	Possible losses	Value
Very serious	It may cause very serious losses to corporate finance	5
Serious	It may cause serious losses to corporate finance	4
General	It may cause losses to corporate finance	3
Not too serious	It may cause slight losses to corporate finance	2
Negligible	It will not cause losses to corporate finance	1

3.2. RISK REASON ANALYSIS

For analysis of frequency of the identified risk factors, in principle, statistical data is used to determine the probability of risk. However, considering that the audit sampling will be subject to limitations of the quantity of audit sample, grey system analysis method can be applied to specially handle the advantages of small samples and the poor information. The level of risk occurrence degree can be reasonably determined according to the risk

occurrence degree scores as shown in Table 2. [9]

Table 2: Occurrence Degree Scores of Corporate Financial Risks

Possibility of risk occurrence	Probability of occurrence	Value
Very High	P>30%	5
High	10%<P≤30%	4
Intermediate	1%<P≤10%	3
Low	0.1%<P≤1%	2
Very low	P<0.1%	1

The detectability of financial activities is an important factor affecting corporate financial risks. For each detection method, it is required to conduct valuation and analysis and determine the detection degree of corporate financial risks in a reasonable and scientific way based on experts' wisdom and the detection degree scores of corporate financial risks as shown in Table 3. [10]

Table 3: Detection Degree Scores of Corporate Financial Risks

Risk Detection Degree	Risk Detection Method	Value
Almost impossible	There is no detection or inspection method	5
Small	Detection or inspection based on experience	4
Intermediate	General corporate financial management analysis tools are used for detection or inspection	3
High	Financial Group and relevant experts conduct risk detection or inspection with the brainstorming method	2
Affirmative	A special risk management team is established to conduct risk detection or inspection through the rigorous risk management system	1

3.3. RISK IMPACT ANALYSIS

Risk impact refers to the impact of a risk mode of corporate financial activities on corporate financial activities or other parts thereof. Risk impact analysis is to find out the degree of impact brought about at the occurrence of each possible risk mode in corporate financial activities and grade these impact degrees with different analytical methods. The analytical method for risk impact grading often applies the risk priority number method to investigate the severity, occurrence degree and detection degree and calculate risk priority number for each risk mode of corporate finance, thus determining the degree of corporate financial risk and finding out the defects and weak sections in corporate financial activities. For the risk modes with high risk priority number, it is required to find out the risk reasons, develop measures for monitoring, diagnosis and prevention of risks in a scientific way and improve the security of corporate financial activities.

4. EMPIRICAL ANALYSIS

In order to prove the effectiveness of FMEA for audit of corporate financial risk, we specially select the risks confronted in financing activities by SMEs in our country for study. For most SMEs in China, the financial risks in financing are relatively high due to their small operation scale, simple products, insufficient free funds, weak management foundation, poor anti-risk ability, and limited financing channels.

Now, an FMEA analysis is conducted for internal management of financing of a SME. The risk factors are "lack of risk awareness of internal management", "weak foundation and nonstandard management" and "unreasonable debt structure". The FMEA analysis results are shown in Table 4. Table 4 shows that the use of FMEA theoretical method for risk audit of internal management situation in the financing activities of SMEs can conduct quantitative calculation and analysis for the possible risk events, and sort risk events according to the size of RPN value, perform strict control over the risk events with larger RPN value, and take effective measures to reduce risks, which can improve the financing level of SMEs.

Table 4: Potential Risk Modes for Financing of SMEs and Impact Analysis Results

Before improvement measures								After improvement measures				
Risk events	Consequences of failure	Severity	Reason	Occurrence degree	Control measures	Detection degree	RPN	Improvement measures	Severity	Occurrence degree	Detection degree	RPN
Lack of risk awareness	Financial management in chaos, lax financial controls	2	Insufficient understanding of risk and not enough emphasis	3	Enhancing ideological understanding	3	18	Establishing the concept of risk prevention, setting an efficient financial management organization, employing high-quality financial management staff, improving the financial management system, and strengthening the work in financial management	2	1	2	4
Weak foundation and nonstandard management	Poor anti-risk ability	2	Small scale, less self-owned funds, application of patriarch-based management	4	Increasing the accumulation of funds, employing high quality talents	3	24	Establishing a financial risk early warning system, improving response capabilities; improving various rules and regulations, strengthening the management system, improving the overall management level	2	2	2	8
Unreasonable debt structure	Directly affecting corporate refinancing capacity	4	The corporate asset-liability ratio and equity ratio are too high in operation	4	Reasonable debt	3	48	Utilizing financial leverage to control the debt ratio to achieve an optimal capital structure, make the comprehensive capital cost the lowest, efficiency of financial leverage high and financial risks appropriate.	4	2	2	16

CONCLUSION

The Failure Modes and Effects Analysis starts from causal relationship to find out the potential risk factors in corporate finance activities, analyze the impact of risk factors on corporate financial activities, and take measures to prevent the losses brought about by risks. The audit mode for corporate financial risk fully integrates the scientific thoughts of FMEA for handling risks and audit experts' wisdom, and gives consideration to the interaction effects among factors and gives a more scientific and reasonable judgment for corporate financial risks. Through well conducting risk audit in various sections of corporate financial activities, it is able to promptly find out the problems existing in corporate financial activities. The risks in corporate financial activities can be avoided in a scientific way and corporate financial safety can be guaranteed through the effective information feedback and prompt countermeasures.

REFERENCES

[1] McDermott R, Mikulak R J, Beauregard M. The basics of FMEA. *Productivity press*, **1996**.
[2] Hsu C W, Lee W H, Chao W C. *Journal of Cleaner Production*, **2013**, 57: 142-151.
[3] Makajić Nikolić D, Jednak S, Benković S, et al. *Energy Policy*, **2011**, 39(10): 6168-6177.
[4] Oehmen J, Rebentisch E. Risk management in lean PD. LAI Paper Series" *Lean Product Development for Practitioners*, **2010**.
[5] Taubenberger S, Jürjens J, Yu Y, et al. Problem Analysis of Traditional IT-Security Risk Assessment Methods–An Experience Report from the Insurance and Auditing Domain//Future Challenges in Security and Privacy for Academia and Industry. *Springer Berlin Heidelberg*, **2011**: 259-270.
[6] Khidzir N Z, Mohamed A, Arshad N H H. Information Security Risk Management: An Empirical Study on the Difficulties and Practices in ICT Outsourcing//*Network Applications Protocols and Services* (NETAPPS), **2010** Second International Conference on. IEEE, **2010**: 234-239.
[7] Wenxiang X, Koo L C, Khong E Y W. *Journal of Modern Accounting and Auditing*, **2013**, 9(7): 928-952.
[8] Curkovic S, Scannell T, Wagner B. *Modern Management Science & Engineering*, **2013**, 1(2): p251.
[9] Kuo T C, Chu C H. *International Journal of Precision Engineering and Manufacturing*, **2013**, 14(6): 1057-1063.
[10] Klumpp M, Ostertag M. Quality Management Impacts on Logistics Networks measured by Supply Chain Performance Indicators. *Global Logistics Management–Sustainability*, Quality, Risks, **2008**: 129-148.