

DIFFERENCE BETWEEN INTERNAL AND EXTERNAL SUPPLY CHAIN RISKS ON ITS PERFORMANCE

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Abstract

Supply chain management as one of the twenty-first century manufacturing paradigm in improving the competitiveness of the enterprise, is important. Also, increasing competition in global markets and customer expectations have led to more carefully examination supply chains in organizations. Purpose of this study is assessing the impact of the difference between internal supply chain risks and external supply chain risks on supply chain performance. This research in terms of the purpose is the applied and in term of methods and implementation is descriptive from type of survey and a method of collecting data in this research is field. Also research tool is questionnaire. Food Industries companies of Rasht is considered as the statistical population that number of food industries companies in Rasht is 108 units and sample is consists of 84 units. Sampling method is convenience non-probability. Research hypotheses were tested through ANOVA and regression and t-test. The results of testing data show that there is no significant difference between the likelihood of internal and external risks. But external supply chain risks have a greater impact on the supply chain than internal supply chain risks and also the result of ANOVA indicated that there is significant differences between the different levels of the company's risk management with performance. Ie whatever higher the level, the average corporate performance will be higher.

Keywords: Supply Chain, Performance, Internal Risks, External Risks

1. INTRODUCTION

There are risks in all institutions and organizations and in the absence properly management, it can enter multiple losses that this loss may create directly or through income and capital Losses or create indirectly and from restrictions for achieve the objectives of trade and financial (Jamaat, Asgari, 2010). The objective of supply chain management is to improve the supply chain process because appropriate product gets to customers on time and with minimum cost (Si et al, 2007). Believing that supply chain management can lead to better respond to customer and ultimately more profitable, many managers have been attention supply chain management (Ketchen et al, 2004).

In the last decade, supply chain management void from Intangible state and has become a strategic element that can affect positive and significant impact on the activities of organizations. Development arising from technology in market conditions, Transformation of business practices, new expectations and anticipations of partners in the supply chain and finally, demand for greater created value from the final consumer is in such cases in changes of supply chain management (Lancioni et al, 2003). Identifying risks management within the supply network and using a coordinated approach among all members of the supply chain to reduce the vulnerability of supply chain is defined as risk management of supply chain (Goh

et al, 2007). The purpose of risk management is to identify risky situations and providing strategies to reduce the probability and impact of a risk event (Fana et al, 2007). In this research is identified internal and external risk and is evaluated risk management impact on business performance.

2. LITERATURE REVIEW

The first task of any business is survival. The fundamental principle of business isn't maximizing profit but to avoid harm. All companies and factories are established with the goal of sustainability and profitability but all organizations are not successful in this regard. Identify areas and activities that could imposes damage to the system or staff face at risk and threaten the survival of the organization is essential (Hendi, 2007).

Supply chain is a dynamic entity that flow of information has goods and money in it. The term of supply chain represents the flow of materials and goods, information and money that has flow from customers to retailers, then to the distributors / wholesalers and to the final product manufacturer and then to suppliers and reverse (Chopra, 2007). Effective supply chain management is the main factor of survival (Quayle, 1998). However, effective management of the supply chain creates a competitive advantage for many organizations nowadays (Davis, 1993). Suppliers are facing to survive in a market with increasing pressure in the areas of flexibility, diversity, time and value (McGuffog, 1996). These demands cannot be solely caused within internal boundaries of organizations by making changes and their effective satisfy needs to use supply chain dynamics that organization is busy in it (Sivadasan & et al, 2000; Makoei & Madadi, 2004).

The definition of risk is now undergoing many changes and its scope are highly developed. Due to this issue, development of risk management and coping strategies is necessary. In current situation risk management in relation to other effective factors in the chain has the most important. Meanwhile, not far in the years organizations was not given much important this issue and in term of organizational perspective, quality is the main factor affecting (Ghaderi & Karimi, 2007).

Risk management in order to protect against adverse consequences of risk tolerance and to ensure the benefits of adopting risk is useful. In the past, many investors were familiar with the concept of risk management, but risk management mostly would apply in the form of methods to reduce risk through quality control, safety principles training, and increasing security coefficient and insurance of persons and property. Nowadays, risk management is not necessarily equivalent to reduce the risk in other words, the objective of risk management is not risk avoidance, but in risk management, we're looking for hunting opportunities (Culp, 2001).

Thus according to content presented and the importance of supply chain risk management, the main research question is: is there difference between internal risks of supply chain and external risk of supply chain on supply chain performance?

A research in 2011 by Thun et al about supply chain risk management is done. The purpose of research is to analyze supply chain risk management practices. The analysis is based on a survey with 67 manufacturing plants conducted in the German automotive industry. After investigating the vulnerability of supply chains in general and examining key drivers of supply chain risks, the paper identifies supply chain risks by analyzing their likelihood to occur and their potential impact on the supply chain. The results are visualized in the probability-impact-matrix distinguishing between internal and external supply chain risks. Furthermore, instruments for dealing with supply chain risks are investigated. Therefore, the impact of supply chain risk management on performance is tested. In order to distinguish between companies with a high degree of supply chain risk management and those with no or

only limited implementation the plants are grouped by means of a cluster analysis based on factors reflecting the instruments of supply chain risk management. In particular, groups are created representing two different approaches to deal with supply chain risks, i.e. reactive and preventive supply chain risk management. The clusters are investigated concerning differences in terms of performance criteria. The analyses reveal that companies with a high implementation degree show a better supply chain performance. Furthermore, the results show that the group using reactive supply chain risk management has higher average value in terms of disruptions resilience or the reduction of the bullwhip effect, whereas the group pursuing preventive supply chain risk management has better values concerning flexibility or safety stocks.

Theoretical framework for this research has been considered by research performed of Thun et al in 2011.

Supply Chain Risk Management: the risk management is systematic process of identifying, analyzing and responding to risk. This management includes maximizing the likelihood and consequences of positive events and minimizing the likelihood and consequences of adverse events with desirable objectives (Ghari & Karimi, 2007). To assess risk management is used reactive and preventive instruments.

Supply chain management instruments: Supply chain management instruments can be distinguished by preventive instruments and reactive instruments. Preventive instruments are cause-related measurements that strive for lowering the probability of risk occurrence. Reactive instruments are effect-oriented measurements that strive for mitigating the negative impact of an incident. Reactive instruments do not directly act on the risks but strive for absorbing the damage caused by a risk. Criteria used in this study to assess the risk management include: suppliers with high quality, suppliers with a high on-time delivery, prevention of geopolitical risks, supplier development (related to preventive instruments); multiple sourcing, back-up IT systems, safety stocks (related to reactive instruments).

Supply chain performance: performance represents achievement amount of company to financial and market objectives (Rajabzadeh, 2010). Supply chain performance include increasing on-time deliveries, failure reduction, reactivity improvement, decreasing stocks, less internal interruptions, cost reduction, increased flexibility, reduction bullwhip-effect and external disruptions resilience.

External supply chain: External supply chain facing environmental factors that can affect a direct and indirect on the supply chain. They can be due to political reasons, economic, technological or geographical (Kleindorfer & Saad, 2005). Criteria used to external supply chain include: supplier failure, supplier quality problems, oil crisis, malfunction of IT-system, accident (e.g.fire), natural disaster.

Internal supply chain: Internal supply chain risk caused by problems in organizational boundaries include such as faults of machines or problems related to information technology (Rice & Caniato, 2003). Criteria used for internal supply chain are: machine breakdowns, import or export restrictions, transportation failure, delivery chain disruptions, increasing customs duty, change in customer demand, technological change, increasing raw material prices.

3. RESEARCH HYPOTHESES

1. There is difference between likelihood to occur internal supply chain risks and external supply chain risks.

2. External supply chain risks have a greater impact on the supply chain than internal supply chain risks.
3. Companies with a high degree of supply chain risk management show a higher performance than companies with a low degree.

4. RESEARCH METHODOLOGY

This research in terms of the purpose is the applied and in term of methods and implementation is descriptive from type of survey and a method of collecting data in this research is field. Food Industries companies of Rasht is considered as the statistical population that number of food Industries companies in Rasht is 108 units and sample is consists of 84 units. Sampling method is convenience non-probability. Also research tool is questionnaire. Validity of questionnaire is confirmed by advisors and supervisors. To determine the reliability of questionnaire was used Cronbach's alpha method. Considering that, all alpha coefficients obtained are more than 70 percent; therefore, questionnaire has the necessary reliability. Research hypotheses were tested through ANOVA and regression and t-test.

5. DATA ANALYSIS

In first according to hypothesis type was used test of the mean difference. To identify the type of test was used first test of Kolmogorov - Smirnov. Results obtained from test of the Kolmogorov - Smirnov showed that significant level is greater than 0/05. So the data distribution is normal.

Table (1) t-test of first hypothesis

First hypothesis	correlation coefficient	Sig	Result
There is difference between likelihood to occur internal supply chain risks and external supply chain risks.	0.422	0.594	Rejected

Results of the first hypothesis show that the correlation coefficient is equal to 0/422. Due to the significant level amount that is equal to zero (sig = 0/000), in results between these two variables (internal and external risk likelihood) there is a significant correlation. T-test results show that the significance level is greater than 5% (sig=0/594), so there isn't significant difference between likelihood to occur internal supply chain risks (3/3571) and external supply chain risks (3/3289).

Table (2) t-test for between external and internal of risk

hypothesis	correlation coefficient	Sig	result
There is difference between external risk and internal risk	0.805	0.000	Confirmed

Results of the second hypothesis show that the correlation coefficient is equal to 0/805. Due to the significant level amount that is equal to zero (sig = 0/000), in results between these two variables (internal and external risk impact) there is a significant correlation. T-test results

show that the significance level is less than 5% ($\text{sig}=0/008$), so there is significant difference between impact to occur internal supply chain risks (3/2460) and external supply chain risks (3/3973). Impact of external risk is higher.

Table (3) Regression test between supply chain risks and performance

Independent Variables	B	Beta	sig	Result
Internal risk	0.181	0.360	0.030	Confirmed
external risk	0.012	0.152	0.035	hypothesis

Dependent variable: performance

Regression test results also show that according to $R=0.491$, impact of external risks and internal risks have effect on performance and according to sig value is less than 0.05, this impact is significant. Also, in order to determine orientation of this impact, according to positive coefficient B can be concluded that this impact is direct.

According to beta coefficient can be said, the results of the external risks has greatest impact on supply chain performance. So the hypothesis is confirmed. Meanwhile, R^2 in this hypothesis is 0/241. Approximately 24 percent of the independent variables can predict the dependent variables.

Table (4) ANOVA test

Third hypothesis	f	Sig	Result
Companies with a high degree of supply chain risk management show a higher performance than companies with a low degree.	38.528	0.000	Confirmed

The results of third hypothesis testing show that according to the ANOVA since $\text{Sig} = 0/000$ and this amount is less than 0.05. Therefore can be concluded that there is significant difference between different levels of the supply chain risk management on corporate performance. Duncan test also shows that between low level, intermediate and high risk management, there are significant differences and whatever higher the level, the average corporate performance will be the higher. Thus, the third hypothesis is confirmed. As can be seen average performance in high risk management is 26.60, intermediate average 23.24 and low 21.33.

6. Conclusions and Recommendations

The results of testing data show that there is no significant difference between the likelihood of internal and external risks. But external supply chain risks have a greater impact on the supply chain than internal supply chain risks and also the result of ANOVA indicated that there is significant differences between the different levels of the company's risk management with performance. Ie whatever higher the level, the average corporate performance will be higher. According to result obtained express recommendations as follow:

1. The subject of comprehensive view in relation to the identification of potential risks throughout the supply chain is important. Therefore should attempt to the management system to identify and assess overall risks in each component of chain. In relation to the overall supply chain can be attempt to identify, analyze and monitor and have better respond and more flexibility than the risk.
2. The results of the second hypothesis show that external supply chain risks have a greater impact on the supply chain than internal supply chain risks. Therefore, it is recommended that

with risk management avoid from occurrence of risks and be devised constantly measures to deal with these risks.

3. The results of the second hypothesis show that companies with a high degree of supply chain risk management show a higher performance than companies with a low degree. Therefore, it is recommended that be used proactive and reactive risk management tools, such multiple sources; develop suppliers, suppliers of high quality....

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