

RISK TRANSFER STRATEGIES AND SUPPLY CHAIN RESILIENCE IN THE PETROLEUM INDUSTRY IN KENYA

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Abstract

Supply chain risk management is critical for the success of organizations in the petroleum industry. Due to supply chain disruptions in the industry, businesses dealing with petroleum tend to face supply demand inconsistencies resulting into delayed supplies, operational inefficiencies and thus poor customer satisfaction. Such adversarial situations eat into the sales and hence the profitability of the organizations in the industry. In this regard, appropriate risk transfer mitigation strategies are necessary for petroleum firms to curb supply chain risks. This study empirically tests the influence of risk transfer strategies such as insurance, outsourcing, subcontracting, partnerships, acquisitions and mergers on supply chain resilience in petroleum industry in Kenya. Descriptive method, particularly, regression analysis was used to analyze data. The data was obtained through self-designed questionnaires from 87 registered oil marketing firms and the study established a positive but a weak relationship between risk transfer and supply chain resilience. The study

concludes that risk transfer strategies have a positive influence on supply chain resilience. The study recommends organization in petroleum industry to employ risk transfer mitigation strategies to enhance supply chain resilience.

Keywords: Risk Transfer, Supply Chain Resilience, Petroleum Industry

INTRODUCTION

The concept of supply chain resilience has gained prominence in the recent few decades no doubt because of the prevalence of disruptive disasters. For instance, several disasters including earthquake and tsunami that hit Japan in 2011, catastrophic flooding in Thailand in 2011, hazardous spill of chemicals in Arizona in the United States of America in 2014 (Chopra & Sodhi 2014), Typhoon Rammason that hit the Philippines and claimed at least 64 lives as well as Sea pirates in Somalia and Yemen in 2015 to mention a few, caused disruptions to people and business supply chains (Osoro, 2015). No doubt, such disruptions often leave the people and firms that are affected with challenges as the supplies are cut off and as Durachet *al.* (2015) observe, some firms fail to recover.

Christopher and Peck (2004) argue that supply chain resilience is a purchase and supply configuration with two complementary system capabilities: capacity to resist disruption and ability to recover from disruptive changes. Ponomarov and Holcomb (2009) define supply chain resilience is a firm's ability to repel adverse change that can distress its supply frameworks and it includes firm's capacity to bounce back and recover from costly disruptions. Building resilient supply chain is essential in order to have a supply system that can resist the disruption and recover their operational capability almost immediately if the worst happens. According to Jüttner and Maklan (2011) supply chain resilience is important since it gives a firm some competitive advantage.

With increasing supply fluctuations, firms in the petroleum industry need to be intentional in dealing with risk exposures to improve supply chain resilience (Kwak, 2014; Pereira & Silva, 2015). Risk transfer is one of the possible strategies that organizations in the sector can use to manage supply chain risks. Through risk transfer, the affected firms are able to shift the consequences of the risk including the uncertainties and costs associated with the risk exposure to third parties like insurance companies, using derivative markets (Herrera, 2013). This study sought to establish the influence of Risk Transfer strategies on Supply Chain Resilience in Petroleum Industry in Kenya.

Supply Chain Risks in Petroleum Industry

Petroleum industry is a complex and one of the largest industries. According to Amponsah and Opei (2014) it touches on the everyday life of people throughout the world by providing energy for electricity, heating, lighting, lubrication, and transportation amongst other uses. As of 2016, World Factbook (2016) and OPEC (2016) indicated that the world consumes 30 billion barrels of oil each year with the developed economies being on the lead in consumption. This industry is under continuous change. Occasional shifts in crude oil prices and supply shortage associated with the product poses risk to businesses in the petroleum sector.

Mohanty and Nandha (2011) opine that demand and supply shocks are common in the petroleum sector and the firms in the sector get badly hit by such instability. First, it is costly to startup petroleum operations. Shutting down is costly because of the heavy capital investments. Also, price fluctuations due to essential commodity supply fluctuations and the uneven production makes the industry volatile. In addition, other economic factors like macroeconomic and financial crises can independently affect the industry substantially. Moreover, political risks through numeral legislations and geopolitical risks due to possible unconventional extraction and transport of crude oil can stifle supply (Tseghe, 2013). Therefore, an appropriate supply chain risk management strategy is essential for organizations in such a volatile sector to attain competitive advantage and profitability.

LITERATURE REVIEW

Risk Transfer Strategy and Supply Chain Resilience

Alfred (2013) defines the term risk transfer as shifting of responsibility to manage and resolve risk to other entities who may have better capability to manage it. It implies a contractual arrangement or subcontracting certain activity and according to Ignacio (2016) it involves subscribing to insurance against certain supply chain risks. Herrera (2013) adds that supply chain risk transfer can take the form of insurance of the particular risk, outsourcing or entering into partnerships. Therefore, apart from purchasing insurance, petroleum dealers can outsource or partner with other entities so as to be helped to handle certain tasks that are not core-competency of the entity. That allows the firm to concentrate with its core competency task (Urciuoli *et al.*, 2014).

The contractual agreement to transfer risk which is a legal agreement allows the firm to be compensated for the insured losses. Also, Ignacio (2016) the entity can operate with minimal uncertainties about demand and supplies and the occurrence of the risk. Furthermore, use of derivatives to hedge the risks associated with its supply chain can help the petroleum dealers to avoid adverse losses that may stifle their operations. In addition, Urciuoli *et al.* (2014) opine that

appropriate contractual agreements can ensure that the petroleum dealers only experience minimal shortages which enhance their supply chain resilience. Also, insurance provides a mechanism for risk transfer. In case of a loss, the firm is paid for the loss.

Courchene and Robert (2016) posit that risk transfer enhances a firm's quality assurance as the insurer evaluates the risk faced by the client before they come into agreement to insure them against the risk type. For instance, the firm has to put mechanisms to stop risk from occurring. Also, since risk transfer has some cost implication on the firm, the organization has to evaluate the exposure more carefully and consider alternative measures to manage the exposure. According to Pereira and Silva (2015) the entire process of evaluating whether to transfer risk, which risks to transfer and which ones to retain, coupled with the benefits of relieving the organization of risk uncertainties and associated costs when supply chain risk occurs can work together to create more robust supply chain frameworks. This study sought to empirically test the relationship between risk transfer and supply chain resilience. Using data from 87 registered dealers, the study is guided by the following study hypothesis:

Ha: Risk Transfer has a positive influence on Supply Chain Resilience in Petroleum Industry in Kenya.

METHODOLOGY

The study followed descriptive research design and regression techniques were used to test the relationship between the study variables. Data was obtained from 87 active registered oil marketing firms licensed by the Ministry of Energy and Petroleum to import and trade with petroleum product in Kenya. The study instrument was tested for internal consistency prior to actual field study using 10 of the companies and Cronbach's alpha equal to 0.787 was obtained. The 10 firms were excluded during actual data collection to eliminate biases. Two respondents who included the depot manager and either supply chain/logistics managers from remaining 77 firms were targeted for data collection and 150 fully completed questionnaires were obtained. In the self-designed questionnaires, the respondents were asked to rate various Likert type questions regarding their company's use of risk transfer strategies such as insurance, outsourcing, subcontracting, partnerships, joint ventures and mergers and how such measures had influenced their supply chain resilience. Data was tested for assumptions of regression and cleaned before analysis. For the purpose of the regression analysis, the data was transformed into natural logarithm. The ratings were used to generate an index to measure the two study variables. The data was analyzed using SPSS Version 22.

RESULTS AND DISCUSSIONS

The regression analysis results indicated a positive weak correlation between risk transfer and supply chain resilience as indicated by the correlation coefficient 0.293 and coefficient of determination 0.086 as shown in table 1 below. However, the coefficient for risk transfer strategies against supply chain resilience (0.008) was less than the p-value 0.05 as shown in the table below. Therefore, risk transfer strategies employed by the petroleum firms had a positive, statistically significant influence on supply chain resilience of the firms.

Table 1: Model Summary statistics and Coefficients

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.293 ^a	.086	.060	.14588	
a. Predictors: (Constant), LnRisk_Transfer					
Coefficients^a					
Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	3.529	0.779		4.532	0
LnRisk_Transfer	0.508	0.189	0.218	2.685	0.008
a. Dependent Variable: Supply Chain Resilience					

DISCUSSIONS AND CONCLUSION

In this study, risk transfer strategies were hypothesized to cause supply chain resilience positively and the results confirmed the hypothesis. Transfer of the supply chain risk through insurance, subcontracting, outsourcing (Ignacio, 2016) and through partnership, joint ventures and hedging techniques (Herrera, 2013) improves the certainty of the sales from the fuel dealers since the uncertainty of associated costs of fluctuations of price and sales due to market turbulence caused by supply chain disruptions are partly reduced or are entirely born by third parties (Courchene & Robert, 2016). Also, the organization that transfers the risk is able to focus on its core competencies to grow its sales and profitability. Furthermore, Dittmann (2014) argue that third party partnerships are an essential source of strategic information which the entity can benefit from.

In conclusion, the study confirms the alternative hypothesis and concludes that risk transfer has a positive influence on supply chain resilience in Petroleum industry in Kenya. It

makes sense because risk transfer gives the organization a chance to concentrate on its core business and allow other entities to deal with risk. It also eliminates exposures to the company which eliminates shortages from adverse fluctuations. Managers in the petroleum companies should consider transferring of the supply chain risk exposures through either or multiples of insurance, outsourcing, partnerships, joint ventures, mergers, acquisitions and financial derivative hedging techniques. Each firm should consider which technique is more appropriate for the organization.

This study was confined on risk mitigation strategies that influence supply chain resilience in petroleum industry in Kenya. This limited the study from exploring and identifying major risks drivers affecting the industry. Future studies could therefore focus on drivers of petroleum supply chain vulnerability in the context of developing countries like Kenya.

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