

## Supervisor's Approval

'I admit that I have read this dissertation and in my opinion, this dissertation satisfy the scopes and quality for Bachelor of Technology Management (High Tech Marketing)'

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THE FACTORS INFLUENCING SUPPLY CHAIN DISRUPTIONS ON SUPPLY  
CHAIN PERFORMANCE IN SMALL AND MEDIUM ENTERPRISES

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## DECLARATION

I hereby, declared this report is the results of my own research except as cited in references.

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## **DEDICATION**

For dear mother and father.

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## ABSTRACT

In recent years, supply chain has become more complex due to globalization, outsourcing, single sourcing, and the focus on removing slack from supply chains. While these strategies have improved performance, they also made supply chains more prone to disruptions. A major disruption in the supply chain can disturb or even “shut down” a company and have critical consequences on profitability. Small and medium enterprises (SMEs) however didn't fully implement supply chain management (SCM) and this will lead to inefficiency of disruption management. The research focused on SMEs to determine whether factors of disruption affect its supply chain activities. The factors enlisted are shortage of supply (Larrison, 2008), equipment failure (Kliendorfer and Saad, 2005) and lack of buying power (Asfaha, 2008). Questionnaires were distributed to collect respondents' answers. The data collected were analyzed quantitatively. Equipment failure was found to have strong impact to the supply chain performance than shortage of supply and buying power based on strong relationship between it and performance of supply chain. Buying power has the weakest relationship with the performance of supply chain, concluding that it contributes less in the performance. In a nutshell, SMEs can build a stronger supply chain resilience and protection to its network by understanding the cause and effect of the disruptions in their supply chain.

## ABSTRAK

Dalam zaman ini, rantaian bekalan telah menjadi lebih kompleks akibat globalisasi, penyumberan luar, penyumberan tunggal dan tumpuan kepada menghapuskan kecuaihan dari rantaian bekalan. Walaupun strategi ini telah menambah baik prestasi, ia juga menjadikan rantaian bekalan lebih terdedah kepada gangguan. Satu gangguan besar dalam rantaian bekalan boleh mengganggu atau "menutup" syarikat dan mempunyai kesan kritikal kepada keuntungan. Perusahaan kecil dan sederhana (PKS) bagaimanapun tidak melaksanakan sepenuhnya pengurusan rantaian bekalan (SCM) dan ini akan membawa kepada ketidakcekapan pengurusan gangguan. Kajian ini memberi tumpuan kepada PKS untuk menentukan sama ada faktor-faktor gangguan menjejaskan aktiviti rantaian bekalan. Faktor-faktor tersenarai adalah kekurangan bekalan (Larrison, 2008), kegagalan peralatan (Kliendorfer dan Saad, 2005) dan kekurangan kuasa pembeli (Asfaha, 2008). Satu soal selidik telah digunakan untuk mengumpul jawapan responden. Data yang dikumpul telah dianalisis secara kuantitatif. Kegagalan peralatan telah didapati mempunyai kesan yang kuat untuk prestasi rantaian bekalan daripada kekurangan bekalan dan kuasa membeli berdasarkan hubungan yang kukuh di antara ia dan prestasi rantaian bekalan. Kuasa pembeli mempunyai hubungan yang paling lemah dengan prestasi rantaian bekalan, dan dapat disimpulkan bahawa ia menyumbang kurang dalam persembahan. Ringkasnya, PKS boleh membina benteng rantaian bekalan yang lebih kukuh dan perlindungan kepada rangkaianannya dengan memahami punca dan kesan gangguan dalam rantaian bekalan mereka.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of Study

Globalization has exposed many supply chains to complex environments and physically distant events that – due to increasing interconnectedness – have far reaching, even global ramifications (Stalder, 2006). Multinational companies especially faced this challenge as they own extensive supply chain network. This complex nature of the supply chain exposed all the industries to high levels of uncertainty and disruptions. Small and Medium Enterprises (SME), however, face the challenge differently from the larger companies. Arend and Wisner (2005) stated that both of SMEs and Large Enterprises (LE) implemented supply chain management (SCM) differently as the implementation is negatively correlated with SME performance. SMEs don't implement SCM as deeply as LEs. Larger enterprises have the resources and technical budgets to implement e-business and e-supply strategies, but SMEs are continued to be challenged by limited resources. While LEs can handle disruptions systematically, SMEs lack of the capabilities to do so. Due to financial restrain, it is paramount for SMEs to have effective supply chain. Hence, it is fundamental to examine the factors that cause the disruption in supply chain.



## 1.2 Problem Statement

As supply chain management becoming more important, it tends to be burdened with disruptions regardless the size of the enterprise. However, operating with lack of SCM system, SMEs, particularly the upstream, deal the problems differently from the large enterprises. SMEs are not particularly aware of benefits of supply chain management and are exposed to disruptions without proper handling of the case. This inhibits the growth of SMEs in Malaysia operationally although financially, government has been assisting them. The increased globalization and the government's incentive to create an economically stable country require the SMEs to realize the problems within their production and supply chain to improve their business.

There a lot of factors contributing to the problem generally. Hence, do these factors also affect supply chain in small and medium enterprises?

- a. What is the effect of shortage of supply on performance of supply chain in small and medium enterprises?
- b. What is the effect of equipment failures on performance of supply chain in small and medium enterprises?
- c. What is the effect of lack of buying power on performance of supply chain in small and medium enterprises?

### Hypotheses 1

H<sub>0</sub>: Supply shortage has no significance on the performance of supply chain in Small and Medium Enterprises (SME).

H<sub>a</sub>: Supply shortage has significance on the performance of supply chain in Small and Medium Enterprises (SME).

### Hypothesis 2

H<sub>0</sub>: Equipment failure has no significance on the performance of supply chain in Small and Medium Enterprises (SME).

H<sub>a</sub>: Equipment failure has significance on the performance of supply chain in Small and Medium Enterprises (SME).

### Hypothesis 3

H<sub>0</sub>: Buying power has no significance on the performance of supply chain in Small and Medium Enterprises (SME).

H<sub>a</sub>: Buying power has significance on the performance of supply chain in Small and Medium Enterprises (SME).

## **1.3 Research Objectives**

- i. To determine the effect of shortage of supply on performance of supply chain in small and medium enterprises.
- ii. To identify the effect of equipment failure on performance of supply chain in small and medium enterprises.
- iii. To examine the effect of lack of buying power on performance of supply chain in small and medium enterprises.

#### **1.4 Scope and Limitation of the Study**

In this research, researcher will investigate the factors that contribute to supply chain disruption in Small and Medium Enterprises in Malaysia. The factors that will be discussed are supply shortage, equipment failure and buying power against the performance of the supply chain in the companies. The research would cover five sectors in SMEs which are manufacturing, services, restaurants, retails and construction.

The limitation of this research includes the scarce resources (especially books) related to supply chain in SMEs. Restricted and confidential information on companies' supply chain data might hinders during the data collection. Hence, this will restrict researcher's research. Besides that, the lack of knowledge in supply chain by the respondents would limit the actual meaning intended by researcher in survey. Other limitation to this research is time limit. Due to the strict submission time, only three factors are determined.

#### **1.5 Importance of Study**

The purpose of this study is to develop better understanding to the cause of supply chain disruption in Small and Medium Enterprises. As this disruption can lead to declination of supply chain efficiency, consequently the business performance, it is important for these companies to improve their 'defensive' system on respective factors focused in this research. It enhances their view on the problems at hand and how to effectively counterattack the disruptions.

## 1.6 Summary

Chapter 1 outlined the purpose, objectives, problem statement, limitations, scopes and importance of this study. It gives the insights of the topic researcher done to give a clear view of what researcher wanted to do.

The globalization in many industries has exposed them to many threats towards supply chain management. These threats are often called supply chain disruptions. By determining three factors, researcher established objectives, questions and hypotheses to see the relationship of these factors with supply chain disruptions. While only three factors are covered, researcher is limited to discuss other factors due to time limit. This study will help oil and gas industry to realize the consequences of the disruptions and act on them effectively.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

This literature review chapter built on supply chain risk management, primarily the studies examining the impact of disruptions on firms. While many studies show evidence that disruptions cause negative impact on company performance (Hendricks and Singhal, 2003, Sheffi, 2005), less attention has been given to understanding whether specific types of disruptions have impact on Small and Medium Enterprises (SME).

In this chapter, researcher has also included theoretical framework which will be the guidance throughout this research.

#### 2.2 Supply Chain Disruption

Disruptions are defined as major breakdowns in the production or distribution nodes that comprise a supply chain (Handfield et al., 2011). As supply chain become more efficient, it's also become more vulnerable to different disruptions. Recent globalization and the increasing length of the supply chain have exposed each supply chain to more risk factors. The impact of disruption propagates faster through the network because of lower buffer stocks and single sourcing / supplier based reduction (Behdani et al., 2012). According to Craighead et al.(2007), present research has not

only confirmed the costly nature of supply chain disruptions but has also contributed relevant insights on such related issues as supply chain risks, vulnerability, resilience and continuity.

A major disruption in the offshore supply chain can “shut down” a company and have critical consequences on profitability. Events such as 9/11, the war in Iraq and customs delays brought supply chain operations to idle. There are also other events that impacts customer service and cost up the companies involved such as natural disasters, poor communication of customer requirements, parts shortages, and quality problems. Supply chain disruptions can reduce shareholder value by as much as eight to ten percent, or even worse in “time-sensitive” environments where early market introduction is critical to success (Handfield et al., 2011). To date, Culp (2013) explained that it is indicated that significant supply chain disruptions reduce the share price of affected companies by as much as seven percent on average.

Handfield et al. (2011) also explain that there are four enterprise risks that disrupt production operation. Hazard risks refer to weather disasters, equipment shutdown, or product liability, while operational risks include major disruptions such as theft, late supplier deliveries, IT systems shutdowns and many more. Aside from these two risks, financial risks and strategic risks are also commonly discussed between managers.

### **2.2.1 Shortage of Supply**

Raw materials are important in the upstream of supply chain and if those become difficult to acquire, it can harm the business. Larrson (2008) defines material shortage as a lack of material at any point in the factory supply chain that causes a disturbance in the planned order scheduling. She also added that this factor can be caused by both internal and external factor. There are three types of outcomes that may result from material shortage: technological, geographic and operational (Alonso and Gregory et al., 2007).

The availability of raw materials is critical to the ability of suppliers to deliver on time. With increasing volume demands and the rigid coupling of lean manufacturing, almost every raw material shortage distributes as significant delays throughout the supply chain. Because on-time delivery is so important, every supplier must be conscious of their vulnerability to fluctuating prices and a limited global supply (Rosenberg, 2013). Shortages can occur for many reasons, including manufacturing and quality problems, delays, and discontinuations (Association of State and Territorial Health Officials, 2012). According to Tambunan (2009), the shortage of raw materials in Asean countries Small and Medium Enterprises (SMEs) is a least concerns for them compared to the larger firms. In general, while firms may have local access to a resource, sufficient quantities at the correct quality level may be insufficient to meet the specific diverse demand for the resource. A supply disruption that disturbs delivery of finished products to customers may reduce sales revenue in short- term and result in long-term reduction n market share (Gurnani, Mehrotra and Ray, 2011).

### **2.2.2 Equipment Failures**

SMEs play important role in state's economy but the execution have many problems that consequently impact the operations. There are a lot of SMEs' weaknesses including restricted financial, lack of strategic planning and skills, tactical inefficiency, and poor management (Ab Rahman and Wasilan et al., 2011). According to Kliendorfer and Saad (2005), the contingencies happened in operational includes equipment malfunctions and systemic failures.

CFO Research Services (2009) had done a survey which shows 42 percents of respondents claimed that physical asset failures at company-owned facilities negatively influenced performance. Physical failures include smaller-scale of disasters and equipment failures such as fires, explosions, and accidents also proved to be disruptive on the supply chain and finance. When an equipment failure event occurs, there is a consequential loss of profits and buildup of costs. The cost includes lost profit, the cost

of the repair, the fixed and variable operating costs wasted during the equipment downtime a countless of impacts that will reverberate through the business (Sondalini, 2006). Baglee (2008) stated that SMEs typically adapt a run-to-failure maintenance strategy, as this largely needs limited knowledge on why and how the equipment failed. Besides that, senior management within SMEs rarely views maintenance as a strategic issue that will interpret to a significant contribution to the company profit margin.

### **2.2.3 Lack of Buying Power**

According to Dodd and Asfaha (2009), buyer powers come from various factors, including company's size and lack of competition in a particular market. The lack of buying power complicates SME's to influence suppliers by offering large volumes of business. This impacts the price of materials purchased and their level of priority with the supplier if other disruptions occur – for example, natural disaster (Chapman, 2010). The lack of buying power scored 46% of the problems of developing SMEs (Stefanovic, Milosevic and Miletic, 2009).

Chapman and also Matovu and Okello-Obura (2011) explain that the lack of economies of scale in purchase due to limited storage space makes it difficult for SMEs to acquire in smaller volume from large suppliers, where quantities, homogenous standards and regular supply are the main concern for these suppliers.

SMEs often order the supplies whenever they need them. No matter how much the casual buyers may try to negotiate with their suppliers, the lack of planning and fragmentation of orders becomes a weakness of the company (Maindron, 2013). Maindron added that this situation quickly increases overhead expenses and reduces profit margins, and doesn't allow much transparency.