



'Benchmarking, Standardization and Purchasing  
Characteristic and its impact on purchasing and business  
performance in Thailand Food and Beverage industry'

by

Mr. Akapol Sawasdiraksa

A Graduate project of the Six Credit Course  
SCM 2202 Graduate Project

Submitted in Partial Fulfillment  
Of the Requirement for the Degree of Master of Science  
in Supply Chain Management  
Assumption University

November 2007

M2202



**‘Benchmarking, Standardization and Purchasing  
Characteristic and its impact on purchasing and business  
performance in Thailand Food and Beverage industry’**

by

**Mr. Akapol Sawasdiraksa 482-9361**

**A Graduate project of the Six-Credit Course**

**SCM 2202 Graduate Project**

**Submitted in Partial Fulfillment**

**Of the requirement for Degree of Master of Science**

**in Supply Chain Management**

**Assumption University**

**November 2007**

Project Title            Benchmarking, Standardization and Purchasing  
Characteristic and its impact on purchasing and  
business performance in Thailand Food and Beverage  
industry.

Name                     Mr.Akapol Sawasdiraksa


Project Advisor Asst. Prof. Dr. M. Asif Salam

Academic Year November 2007

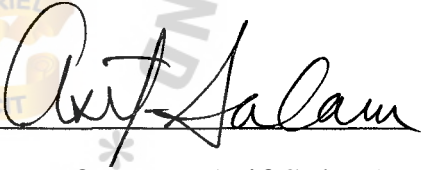
---

ABAC School of Management, Assumption University has approved this final report of the six-credit course, SCM 2202 Graduate Project, submitted in partial fulfillment of the requirements for the degree of Master of Science in Supply Chain Management.

Approval Committee:

  
\_\_\_\_\_  
(Dr.Athisarn Wayuparb)

Committee

  
\_\_\_\_\_  
(Asst. Prof. Dr. M. Asif Salam)

Advisor

  
\_\_\_\_\_  
(Dr.Ismail Ali Siad)

Chairman

November 2007

**Graduate School of Business**  
**ABAC School of Management**  
**Assumption University**

Form signed by Proofreader of the Graduate Project

Jan Lawrence, have proofread this Graduate Project entitled  
Benmar y area an P\_hasi Characteristic and  
its r Business Performan  
and Beverage Industry  
Sawas rae

and hereby certify that the verbiage, spelling and format is commensurate with the quality of internationally acceptable writing standards for a master degree in supply chain management.

Signed R1  
( BRIN ) Lawrence

Contact Number / Email address encc@au.edu

Date: H /

# **Benchmarking, Standardization and Purchasing Characteristic and its impact on purchasing and business performance in Thailand Food and Beverage industry'**

by **AKAPOL SAWASDIRAKSA**, M. Sc. SCM Candidate

Assumption University

November 2007

**Abstract** – This project developed and tested a conceptual model of the purchasing and business performance by focusing on three main factors (Benchmarking in purchasing function, Standardization in purchasing function and Purchasing Characteristic) to have the better understanding on the purchasing function on the overall organization's performance.

In alignment with the previous research, this also represents the empirical efforts to explore and test the model of the relationships between Benchmarking, Standardization, purchasing characteristic, purchasing performance and business performance.

This project seeks the advance our understanding of the purchasing function within the organization in a broader context by focusing on Thailand context especially food and beverage industry. Also discussed about the impact of benchmarking, standardization, purchasing characteristic on purchasing and business performance.

**Keywords** – Benchmarking in purchasing function, Standardization in purchasing function ,Purchasing characteristic, Purchasing performance and Business performance.

**Paper type** – Research paper (Graduate project)

# Acknowledgement

I would like to express my sincere gratitude towards my advisor, Asst. Professor Dr. Mohammad Asif Salam, for his strong support. Since the beginning to the end of my graduate project, he taught me how to write the research paper and he was readily to provide me a prompt advice during my working on the research.

I am also would like to thank all my friends in Supply Chain Management class for their special assistance during my data collections and motivate me to finish the graduate project.

Thank you very much!!!



# TABLE OF CONTENTS

	Page
Abstract & Key Words .....	II
Acknowledgement .....	III
Table of Contents .....	IV
 Chapter 1: Introduction	
1.1 Background of the study .....	1
1.2 Thailand Food and Beverage industry (FMCG).....	1
1.3 Statement of Problem .....	4
1.4 Research Objectives .....	5
1.5 Scope of the study.....	7
1.6 Research Limitations .....	7
1.7 Significance of the study .....	8
1.8 Definition of Key Terms.....	8
 Chapter 2: Literature Review	
2.1 The Evaluation of Purchasing.....	10
2.2 Benchmarking in Purchasing .....	10
2.3 Standardization in Purchasing.....	13
2.4 Purchasing Function Characteristic .....	17
2.5 Performance Measurement .....	20
 Chapter 3: Conceptual Framework and Hypotheses	
3.1 Conceptual Framework.....	25
3.2 Research Hypotheses .....	25
 Chapter 4: Research Methodology	
4.1 Methods of Research Used .....	27
4.2 Sampling Design Process .....	27
4.3 Statistical Analysis .....	31
 Chapter 5: Data Analysis	
5.1 Survey Responses .....	36
5.2 Respondent Demographics .....	39
5.3 Reliability Assessment .....	40
5.4 Analysis of Measurement Model (Confirmatory Factor Analysis- CFA) .....	44
5.5 Analysis of Structural Equation Model and Hypotheses .....	49
5.6 Hypotheses Testing.....	50
 Chapter 6: Research Implications and Conclusions	
6.1 Conclusion .....	55
6.2 Research Implications.....	57
6.3 Limitation and Directions for future research .....	59
References .....	
Appendices A.....	xii
Appendices B.....	xix
Appendices C.....	xxi



## CHAPTER 1

### INTRODUCTION AND RATIONALE OF STUDY

#### 1.1 Background of the study

The role of purchasing in supply chain management is very important as an intermediary step in the supply chain because it connects suppliers with purchasing internal customers who, in turn, provide products and services for external customers (Stanley and Wisner, 2001). The importance of the purchasing function can be easily understood if one also considers that purchased goods and services typically represent from 50 to 70 percent of a company's revenues (Spekman et al., 1999). Consequently, purchasing decisions have a potentially great impact on the firm's end product and the overall business performance.

Purchasing is responsible for obtaining the materials, parts, supplies, and services needed to produce a product or provide a service. You can get some idea of the importance of purchasing when you consider that in manufacturing upwards of 60 percent of the cost of finished goods comes from purchased parts and materials. Furthermore, the percentages for purchased inventories are even higher for retail and wholesale companies, sometimes exceeding 90 percent. Nonetheless, the importance of purchasing is more than just the cost of goods purchased; other important factors include the quality of goods and services and the timing of deliveries of goods or services, both of which can have a significant impact on firm performance. (Spekman et al., 1999)

#### 1.2 Thailand Food and Beverage industry (FMCG)

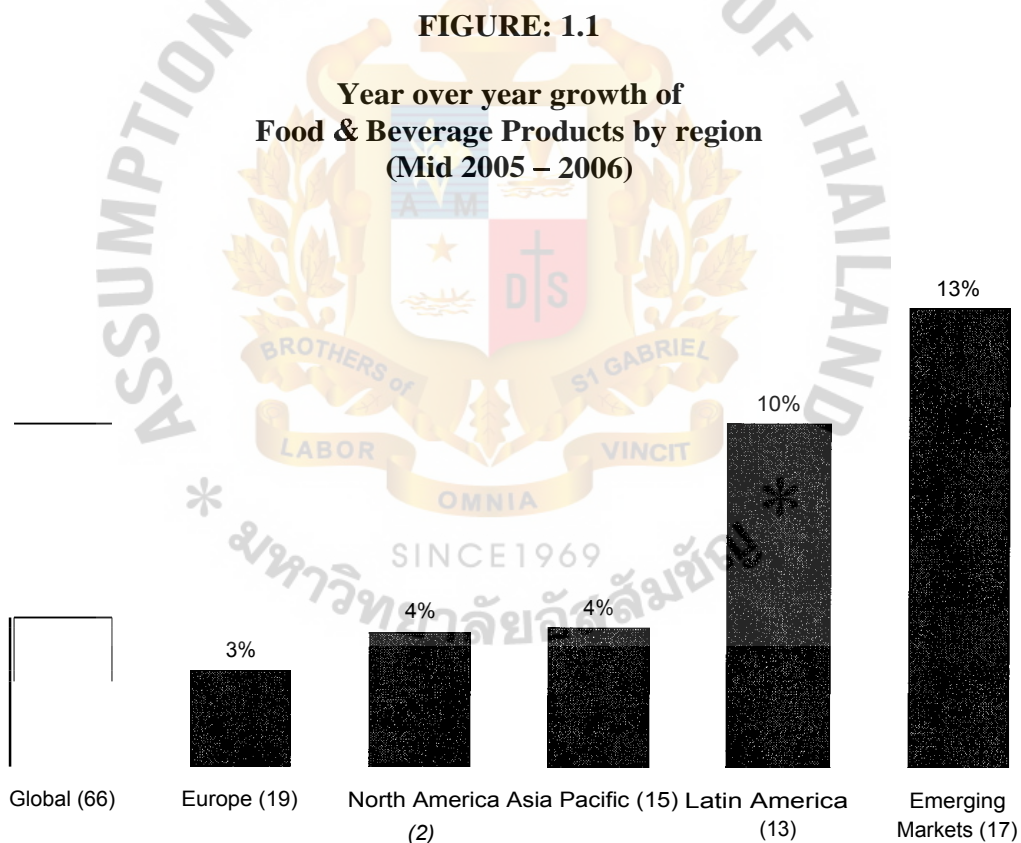
The 2006 edition of 'What's Hot around the World – Insights on Growth in Food & Beverage Products' looks at the fastest-growing categories and product areas across 66 key markets around the world, based on their sales value increases from mid-year 2005 to mid-year 2006. The consumers in these markets make up more than 75% of the



world's population, contributing more than 90% of the world's GDP. (AC nielsen, 2006).

### 1.2.1 Global Findings (AC Nielsen, 2006)

Overall, Food & Beverages grew globally by 4% through mid-2006. Across the markets, the combined sales of Food & Beverage items in these markets grew by four percent in the 12 months ending mid-2006. This growth rate is consistent with the last Food & Beverage study which tracked trends through year-end 2004. Growth rates within regions were also aligned in a similar pattern to the previous Food & Beverage study, although year-over-year growth in both Latin America and in the Emerging Markets was greater than it was in the previous report on Food & Beverages.



**Sources: AC Nielsen, Dec'06**

### 1.2.2 Thailand Expenditure

From the previous survey, approximately 30 percent of overall household expenditure in Thailand is spent on food and beverage sector and it represents the biggest spending

proportion when compared to other FMCG sectors in Thailand. We can see that the trend of the Food and Beverage category remains unchanged. (See table: 1.1)

TABLE: 1.1  
Percentage of Average Monthly Expenditure of Households by  
Expenditure Group

Expenditure Group	1994	1996	1998	1999	2000	2001	2002	2004
(Value : Baht)	7,567	9,190	10,389	10,238	9,848	10,025	10,889	10,885
Total Expenditure	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food and Beverages	33.7	32.2	35.1	33.3	32.2	32.5	33.6	30.6
Alcoholic Beverages	1.6	2.5	1.5	1.7	2.0	1.9	1.3	1.7
Tobacco Products	1.2	1.5	1.2	1.3	1.2	1.1	1.0	0.9
Apparel and Footwear	5.4	4.8	3.5	3.9	3.8	3.2	3.2	3.1
Housing	21.9	20.3	21.4	22.2	22.2	22.4	21.1	20.4
Medical Care	3.5	3.7	2.8	2.7	2.7	2.6	2.3	2.1
Personal Care	2.5	2.4	2.3	2.6	2.7	2.7	2.7	2.6
Transportation and Communications	14.8	15.4	13.3	13.8	14.9	15.7	17.7	21.7
Recreation and Reading	2.2	2.2	1.7	1.7	1.8	1.9	2.0	1.9
Education	1.8	1.8	2.3	2.7	2.5	2.5	2.4	2.2
Miscellaneous	1.1	1.0	1.2	1.1	0.9	0.9	0.9	1.2
Non-Consumption Expenditures	10.3	12.2	13.7	13.0	13.1	12.6	11.8	11.5

Source: Household Socio-economic Survey, National Statistical office Thailand,

[HTTP://WWW.NGO.OR.TH](http://www.ngo.or.th)

When looking in depth at the period October 2005 – October 2006), the Food and Beverage sector shows the biggest proportion , in share and value, when compared to other sectors in the Thailand FMCG industry (as presented in Table 1.2)

**TABLE: 1.2**  
**Value and Percentage Share of the Thailand FMCG Industry**  
**October'05 to October'06**

	VAL(Billion.B.)	Value % Share
TOTAL FMCG	394.7	100
BEER/CIGARETTE/WHISKY	135.8	34.4
BEVERAGE	92.9	23.5
IMPULSE	32.7	8.3
FOODS	48.3	12.2
HOUSEHOLD	28.2	7.1
PERSONAL CARE	56.9	14.4

**Source: Household Socio-economic Survey, National Statistical office Thailand,**  
**[HTTP://WWW.NGO.OR.TH](http://www.ngo.or.th)**

### 1.3 Statement of Problem

The role of purchasing in supply chain management is very important as an intermediary step in the supply chain because it connects suppliers with purchasing internal customers who, in turn, provide products and services for external customers (Stanley and Wisner, 2001). Some organizations still regard the purchasing function only as a supporting function. So, in order to be recognized, purchasing professionals need to demonstrate the contribution they make to their company success. This study allows them to demonstrate the factors that have an impact on the firm's purchasing and overall organization's performance.

*"How can firms enjoy higher purchasing and business performance by focusing on three main factors which include **benchmarking** in the purchasing function, **standardization** in the purchasing function and **purchasing function characteristics**?"*

## 1.4 Research Objectives

This research attempt to study how firms can gain higher purchasing and business performance by focusing on three main criteria which include benchmarking in the purchasing function, standardization in the purchasing function and purchasing function characteristics, which will be discussed respectively.

Purchasing professionals often complain of a lack of recognition by senior management (Bales and Fearon, 1993, p. 6). In order to be recognized, purchasing professionals need to demonstrate the contribution they make to their company success. This study allows them to demonstrate that benchmarking has an impact on the firm's purchasing and corporate performance.

*The first purpose of this research is to examine the relationship between benchmarking, purchasing performance and business performance. We also are interested in examining the indirect positive impact of benchmarking in purchasing on business performance mediated by purchasing performance.*

Secondly, standardization of materials is one important purchasing department decision (i.e. replacement of several materials/components by a single component that has all the functionalities of the materials/components it replaces). More recently, a survey showed that materials standardization was the third most implemented cost reduction strategy in US firms (Purchasing, 2002). Although there exists some anecdotal literature (e.g. Avery, 1998; Porter, 2002) that reports the benefits of using standardization of materials (e.g. reduced purchasing costs, lower inventory levels, and improved supplier delivery performance), the empirical literature is rather scarce.

Another source of standardization contained in the literature pertains to the standardization of the procedures (i.e. pre-set procedures and reference material for performing normal daily purchasing tasks such as ordering, expediting, selection of suppliers, and receipt and inspection of goods) implemented in procuring goods and services for manufacturing. Like standardization of materials, the standardization of purchasing procedures could also be a potential point of cost savings for companies (Bennett, 1982). However, the literature on standardization of purchasing procedures is minimal. In fact, we could not identify any study concerned with the standardization of purchasing procedures and its impact on purchasing performance. There is a lack of



empirical evidence about the impact of standardization of materials and purchasing procedures (standardization in purchasing) on purchasing and business performance. Therefore, we aim to help fill this gap, through the second purpose of this study:

*For the second purpose, we aim to verify whether standardization in purchasing significantly and positively affects purchasing performance. We also are interested in examining the indirect positive impact of standardization in purchasing on business performance mediated by purchasing performance.*

For the Purchasing function characteristic, researchers have produced a range of models and typologies which attempt to identify the various developmental stages of purchasing. These models tend to be conceptual and to lack empirical underpinning; nevertheless they provide a useful background to this study. One of the earliest typologies examining purchasing function configurations was Reck and Long (1988) who identified four stages of development, consisting of purchasing configurations ranging from passive, independent, supportive and integrative. Freeman and Cavinato (1990) identified five stages of strategic purchasing: buying, purchasing, procurement, supply acquisition and facilitating networks. Other practitioner-based models include Cammish and Keough (1991) who proposed four stages: serve the factory, lowest unit cost, coordinated purchasing and strategic procurement. This was later followed by Burt and Doyle (1994) whose four-stage model was comprised of reactive, mechanical, proactive, and strategic supply management. More recently, Monczka, et al. (2002) discussed the purchasing configurations of manufacturing support, price buying, consolidation and integrated strategic sourcing and supply chain management. Despite this considerable attention, there is little empirical evidence showing the current situation of purchasing function development within organizations. Therefore:

*The third purpose of this study is to examine empirically the relationship of purchasing function characteristics and business performance. Another major objective is to examine empirically the effect of purchasing performance on business performance.*

The primary goals of this research are as follows;

1. To test the impact and examine the relationship of benchmarking in the purchasing function, standardization in purchasing function and purchasing

function characteristics on purchasing performance and business performance.

2. To find out the best method to drive the purchasing function to be recognized and leading to a greater level of purchasing and business performance.

## 1.5 Scope of the Study

The scope of the study is to classify and define the relationship between purchasing measurement (Benchmarking, Standardization and purchasing characteristics) leading to purchasing performance and also its leading to business performance. Hence, the scope of this study will be to understand the importance of purchasing measurement in the following ways;

1. The relationship of benchmarking, standardization and purchasing characteristics that have an effect on purchasing performance and business performance.
2. The model is applied to a specific industry (FMCG) Food and Beverage Sector only, whose nature is work related to purchasing and supply chain operation.
3. Relationships among the core dimensions as mentioned above will be examined by using Structural Equation Modeling (SEM). This is to ensure that multiple relationships are investigated at the same time.

## 1.6 Research Limitation

This research paper has the following limitation:

All companies in the food and beverage industry could not be covered because of limitation of time and available sources of data.

As samples were drawn from only one industry, it cannot be representative of other industries because of differences in context.

It is very rare to find research available on the purchasing function and supply chain topic in Thailand. This may lead to a lack of understanding and cooperation, and thus may lead to difficulty in data collection.

## 1.7 Significance of the Study

The findings are useful for practitioners or managers in the following ways;

1. It is a guide and tool for managers to measure the performance and ensure the 'strategic fit' between the firm and its purchasing strategy.
2. It is a guide for managers to develop a better understanding of purchasing function characteristics in the FMCG industry in Thailand.
3. It supports managerial decision-making to ensure the right strategic approach to suppliers so as to best influence the firm's performance.

## 1.8 Definition of Key Terms

**Benchmarking** – the formal process of gathering and analyzing information about the purchasing process and purchasing performance of other organizations (competitors and/or non-competitors) in order to improve the company's own purchasing process and performance Yasin (2002).

**Standardization** - defined as the standardization of purchased materials (i.e. replacement of several materials and components by a single component that has all the functionalities of the materials/components it replaces), and the standardization of purchasing procedures (e.g. standard procedures for ordering, expediting, receipt and inspection of goods, and selection and evaluation of suppliers) (Jayaram and Vickery, 1998).

**Purchasing Function Characteristic**:- defined into four variables that we expect would influence different purchasing and business performance. These variables capture information on the role of purchasing in strategic planning, its status in the eyes of top managers, the level of internal integration and skill development (Carr and Smeltzer, 1997).

**Purchasing Performance** – includes quality of materials purchased, on-time delivery, actual versus target materials' cost, and overall internal customer satisfaction. Chao et al. (1993)

**Business Performance** – Two dimensions have been measured. Production performance assesses the firm's performance on dimensions of product quality, delivery speed, delivery reliability and flexibility of production, using scales adapted

from Carr and Smeltzer (2000). Financial performance was assessed on the basis of return on investment, return on sales, profit growth, and return on total assets (Carr and Pearson, 2002; Carr and Smeltzer, 2000)..

The purpose of this chapter is to provide an overview of this research paper. The next section Chapter 2, introduces the literature review on purchasing measurement (benchmarking, standardization and purchasing characteristic), purchasing performance and business performance respectively. Then in Chapter 3, the research framework and hypotheses are presented. In Chapter 4 the research methodology is described. The data analysis and the results of the study are in Chapter 5. The last Chapter, Chapter 6, will include the research contributions, and conclusions are also provided.





## CHAPTER 2

### LITERATURE REVIEW

This chapter will present various items of literature in attempting to investigate and understand the theory and previous studies that link benchmarking, standardization, purchasing characteristic, purchasing performance and business performance together.

#### 2.1 The Evolution of Purchasing

The literature has tracked the evolution of purchasing from a clerically-based function to a strategically focused process. Here we define purchasing in a broad sense, relating to the full range of potential activities contained within the function, from tactical buying to strategic supply chain management. Purchasing, or supply management as it has increasingly become known, is now viewed as a mainstream value-adding process that is seen as "strategic" to the organization's success (Cousins, 2005). Many authors have argued that competition in the 2000s will be based on firms with the most efficient supply chains (Carter and Ellram, 2003; Lamming, 1993). They argue that sustainable competitive advantage comes from the ability of the firm's supply chain to respond quickly and efficiently to market demand. In most medium to large organizations purchasing is accepted as having a significant impact on the firm's competitive position. However, in order to perform at a more strategic (important) level it is imperative that purchasing has the appropriate configuration and focus.

#### 2.2 Benchmarking

Benchmarking has been defined as "the search for industry best practices that lead to superior performance" (Camp, 1989). Consequently, and for the purpose of this research, benchmarking in purchasing is defined as the formal process of gathering and analyzing information about the purchasing process and purchasing performance of other organizations (competitors and/or non-competitors) in order to improve the

company's own purchasing process and performance. Voss et al. (1997) collected data from 660 managers and found a positive relationship between benchmarking and operational performance. According to these authors benchmarking improves performance by helping a company to identify best practices, set challenging performance goals, and implement decisions based on existing needs.

4223 e- 1

Benchmarking has become an increasingly common management practice in recent years. Researchers, aware of this process, have also started to question the rationale behind benchmarking implementation. A good review of the benchmarking literature can be found in Yasin (2002). Previous studies of benchmarking have addressed such issues as:

**TABLE: 2.1**  
**Summary of previous research paper on Benchmarking**

Previous research paper	Author
Types of benchmarking	Bogan and English, 1994; Sackman, 1992);
How to perform benchmarking	Camp, 1989; McNair and Leibfried, 1992; Spendolini, 1992; Bendell et al., 1993
What to benchmark	Parvoty, 1994
Decision support systems for benchmarking	Korpela and Tuominen, 1996
The relationship between benchmarking, learning orientation and the firm's operational and business performance	Voss et al., 1997
Analytical methods for benchmarking	Landeghem and Persoons, 2001; Forker and Mendez, 2001

The importance of benchmarking in the purchasing function has been widely stressed in purchasing literature (e.g. Dobler and Burt, 1996; Leenders et al., 2002; Monczka and Morgan, 1993; Purchasing, 1994a, b; Stork, 1996). Additionally, independent organizations, such as The Center for Advanced Purchasing Studies (CAPS) and The Global Procurement and Supply Chain Benchmarking Initiative at Michigan State University, are conducting purchasing benchmarking studies across industries allowing participating companies to assess their individual performance against aggregate data (Carr and Smeltzer, 1999).

In the past ten years, benchmarking has become a common practice in purchasing departments (Carr and Smeltzer, 1999). Purchasing managers have started to use benchmarking as a way to identify and understand what practices are necessary to reach world-class standards. However, the academic literature about benchmarking in the purchasing function is rather scarce. Gilmour (1999) developed a methodology to benchmark operations in the supply chain and provided evidence from six companies. Andersen et al. (1999) used the SMArTMAN SME project to identify (benchmark) best practices in several supply chain management areas: information technology tools, make or buy decision, supplier searches and progress reporting, and supplier-customer relationships. Carr and Smeltzer (1999) collected data from 739 firms and analyzed the relationship between purchasing benchmarking, strategic purchasing and firm performance. Although the authors offered an operational definition of benchmarking in purchasing, that failed to consider the establishment of a formal procedure for benchmarking and the need for information from other organizations (competitors and/or non-competitors) in order to conduct a benchmarking analysis.

Landeghem and Persoons (2001) developed a method to benchmark logistical operations. This method was designed to assist managers in detecting performance gaps and identify logistical actions that needed to be implemented to improve performance. Forker and Mendez (2001), collecting data from 292 firms, developed an analytical method for benchmarking best peer suppliers. The method was intended to help purchasing managers to identify suppliers that could benefit most from supplier development efforts.

The need for additional research about benchmarking and its impact on purchasing and business performance is evident. As Yasin (2002) remarked, researchers need to develop methodologies to guide benchmarking practices in emerging technologies and practices, such as supply chain management. Yasin (2002) also stressed the lack of studies that quantify the costs and benefits associated with the implementation of benchmarking. For the purpose of this research, benchmarking in purchasing is defined as the formal process of gathering and analyzing information about the purchasing process and purchasing performance of other organizations (competitors and/or non-competitors) in order to improve the company's own purchasing process and performance. The study showed that, benchmarking in the purchasing function has a significant positive impact on purchasing performance. The research also confirmed the notion that firms with high levels of purchasing performance also achieve high levels of business performance. Also, there is a positive indirect effect of benchmarking on business performance. Hence, purchasing managers may use benchmarking to improve purchasing performance in several ways. Benchmarking could be used as a tool to identify more advanced purchasing practices; to set challenging purchasing performance goals; and to acquire a better understanding of the company's purchasing strengths and weaknesses relative to competitors, and implement improvement activities based on existing needs (Cristobal S; Angel R.; Jose G ; 2003). However, few studies have addressed the implementation of benchmarking in the supply function and its impact on purchasing and business performance.

### **2.3 Standardization in Purchasing**

A number of studies on standardization of materials referred to it as "component-part commonality", that is, replacing many unique parts with a single common part – one that has all the functionality of the parts it replaces (Hillier, 2002; Perera et al., 1999) . These studies have covered such issues as



TABLE: 2.2

Previous Studied related with Standardization

Previous research paper	Author
The development of a measure of component-part commonality	Collier, 1981; Wacker and Treleven, 1986
The influence of component-part commonality on workload	Collier, 1982; Guerrero, 1985; Vakharia et al., 1996
Safety stock	Baker, 1985; Collier, 1982; Gerchak et al., 1988; Hillier, 2002; Perera et al., 1999
Planning, and scheduling	Berry et al., 1992
Operational performance indicators such as set-up and holding costs	Collier, 1981,1982
Order quantity economies	Gerchak et al., 1988
Inventory costs	Eynan and Rosenblatt, 1996; Hillier, 1999
Production costs	Nagarur and Azeem, 1999

While the impact of materials standardization on manufacturing performance has received considerable attention, the number of studies dealing with its impact on purchasing performance is rather scarce.

Dowlatshahi (1992), in her paper about concurrent engineering, discussed the role of materials standardization as an area of collaboration between the purchasing and design functions. However, the effect of materials standardization on purchasing performance was not addressed. Jayaram and Vickery (1998) empirically analyzed the relationship between procurement lead-time and overall performance and identified standardization as an antecedent to procurement lead-time performance. They defined standardization as "the use of standard procedures, materials, parts, and/or processes in designing and manufacturing a product" (Jayaram and Vickery, 1998, p. 23), which does not consider the use of standard procedures in purchasing. Using the same definition of standardization as in Jayaram and Vickery (1998), Jayaram et al. (2000) found that standardization was the most influential enabler affecting delivery speed and

responsiveness to a customer's performance. According to this result, it seems that standardization of procedures, parts, and processes has a positive influence not only on being able to deliver on time but also on meeting customer needs effectively, which in turn is likely to have a positive effect on business performance. However, Jayaram et al. (2000), like Jayaram and Vickery (1998), did not consider the use of standard procedures in purchasing and did not test the effect of standardization on purchasing performance.

Additional literature has shown that purchasing managers can save money by developing standard purchasing procedures that would enable them to spend more valuable time on "non-routine" activities (Bennett, 1982), such as cost/value analysis, supplier development, and concurrent engineering. According to Imai (1997), standard procedures have the following features: they represent the best, easiest, and safest way to do an activity;

1. They provide a method for managing knowledge through
2. The preservation of "know how" and expertise;
3. They can be used as a reference to evaluate performance;
4. They provide a basis for both maintenance and improvement activities; and
5. They provide a basis for training, auditing, and diagnosis.

Standardization of materials (i.e. replacement of several materials/components by a single component that has all the functionalities of the materials/components it replaces) is one important purchasing department decision. Purchasing professionals have ranked purchasing responsibility for standardization second to highest in terms of projected future responsibility of purchasing in strategic decision making (Ellram and Pearson, 1993). More recently, a survey showed that materials standardization was the third most implemented cost reduction strategy in US firms (Purchasing, 2002). Although there exists some anecdotal literature (e.g. Avery, 1998; Porter, 2002) that reports the benefits of using standardization of materials (e.g. reduced purchasing costs, lower inventory levels, and improved supplier delivery performance), the empirical literature is rather scarce. The impact of materials standardization on manufacturing

performance has received considerable attention, the number of studies dealing with its impact on purchasing performance is rather scarce.

Standardization of materials provides the possibility of buying a smaller variety or number of brand-name materials in a larger volume resulting in lower unit cost through quantity discounts, as well as lower transportation, procurement, and materials management costs (Bennett, 1982; Perera et al., 1999). Larger purchasing volumes through standardization can also allow buyers to leverage purchases and negotiate better purchasing conditions, which could result in better delivery, quality, and flexibility. Standardization of materials can also increase purchasing performance by improving the delivery reliability from suppliers and reducing the obsolescence cost of materials. Reducing the number of vendors and improving the relationships with suppliers, can both prevent unexpected delays and increase delivery reliability. A great reduction of obsolescence cost can be expected from standardization of materials among several products and among product generations (Perera et al., 1999).

A second source of standardization contained in the literature pertains to the standardization of the procedures (i.e. pre-set procedures and reference material for performing normal daily purchasing tasks such as ordering, expediting, selection of suppliers, and receipt and inspection of goods) implemented in procuring the goods and services for manufacturing. Like standardization of materials, the standardization of purchasing procedures could also be a potential point of cost savings for companies (Perera et al., 1999).

The use of standard purchasing procedures should reduce the possibility of errors and ease the tasks involved in identifying the root causes of a problem in the purchasing process. Once a problem has been fully identified, corrective action can be quickly implemented and the procedures may be rewritten to eliminate the problem. To date, our study appears to be the extent of the literature that currently explores the standardization of purchasing procedures and provides us the opportunity to investigate the effect of standardization of purchasing procedures on purchasing and business performance. Standardization of materials/components and standardization of purchasing procedures has been considered both by practitioners and academics as improving purchasing and business performance. Purchasing can also have a significant impact on firm performance (Chen et al., 2004).

However, the arguments supporting these relationships have been based on anecdotal evidence (e.g. Avery, 1998; Porter, 2002), case studies (e.g. Handfield, 1993), and empirical studies with limited samples (e.g. Jayaram and Vickery, 1998; Jayaram et al., 2000). Consequently, there is a need for more comprehensive empirical evidence that assesses the benefits associated with materials standardization and standardization of purchasing procedures and, more specifically, their impact on purchasing and business performance. Moreover, some companies who did not emphasize the standardization in the purchasing function in the organization might not enjoy this higher level of purchasing and its effect on business performance.

Because there is a lack of empirical evidence about the impact of standardization of materials and purchasing procedures (standardization in purchasing) on purchasing and business performance, this paper filled an important gap in the purchasing literature in the Thailand Food and Beverage industry.

## **2.4 Purchasing Function Characteristics**

Drawing upon research into the role of the purchasing function, we defined four variables that we expected would influence different purchasing configurations and business performance (Carr and Smeltzer, 1997; Rosenzweig et al., 2003). These variables capture information on the role of purchasing in strategic planning, its status in the eyes of top managers, the level of internal integration and skill development. The following section explains how each variable was defined and why it is likely to influence the configuration of a purchasing function.

### *2.4.1 Strategic purchasing.*

The strategic nature of purchasing has been a cause of debate since the late 1970s (Farmer, 1972; Kraljic, 1983). Since, then, researchers have argued that purchasing has an increasingly pivotal role in the management of the firm's resources evolving from a buying function to a strategic partner in the business (Cooper and Ellram, 1993; Ellram and Carr, 1994). They have argued that purchasing cannot take part in the firm strategy debate until it is seen as strategic (Ammer, 1989; Carr and Smeltzer, 1997). Others have documented how strategic purchasing can participate in the strategic planning process itself (Cavinato, 1999), and how it needs to develop and foster cross-functional integration (Carter et al., 1998). Purchasing can also play a key strategic role in the



integration of the internal organization and the customer (Novack and Simco, 1991). Recent studies have examined the contribution of strategic purchasing to firm performance (Chen et al., 2004). Cousins (2005) recently argues that perhaps the debate is not about how purchasing should become more strategic but what do we mean by the term "strategic" in this context.

A strategic purchasing function can help a firm to sustain its competitive advantage in a number of ways. First, it provides value in the area of cost management. Effective management of the cost of inputs to production saves the firm dollars that go straight to the firm's bottom line profits. Second, it provides the firm with valuable information concerning supply trends that will enable the firm to make better decisions and achieve its goal. Third, it establishes close relationship where appropriate with suppliers to improve the efficient quality and delivery of material (Hogan and Armstrong, 2001).

#### *2.4.2 Status of the purchasing function.*

The status of the purchasing function has been the subject of long debate beginning with Farmer (1972). We define status as how purchasing is viewed by top management, and by other functions (Can and Smeltzer, 1997). Purchasing status acts as a precursor for many of the characteristics of purchasing that the literature considers as being "strategic". High levels of status occur where the function has strong top management support. Not only does top management play an important role in influencing the organizations' attitude toward purchasing, but can also devote resources in terms of time, personnel and finance toward improving the capability of the function. Where purchasing is considered strategic, it is more likely to be involved in the strategic dialogue of the firm. Other functional areas may also engage with purchasing to seek input and leverage their expertise. With this in mind, we now turn to discuss the issue of internal purchasing integration.

#### *2.4.3 Integration of the purchasing function.*

The integration of internal business functions and processes is a difficult challenge for most organizations. The issue is further compounded in purchasing functions where they are expected to not only integrate with other internal functions, but also to align

with their supply chain activities. Purchasing integration has been discussed by scholars focusing on internal (Narasimhan and Das, 2001) and external aspects (Frohlich and Westbrook, 2001). Narasimhan and Kim (2002, p. 303), for example, argue that a firm needd to proactively seek efficient linkage or integration among its various internal functions, and with its suppliers and customers comprising its supply chain .Purchasing integration, in the context of this study, is "the integration and alignment of strategic purchasing practices and goals with that of the firm" (Narasimhan and Das, 2001, p. 593). Poor integration of purchasing with the activities of other functions often results in slow problem solving, poor information exchange and low levels of firm performance (Pagell, 2004), while high levels of integration can improve business performance. For example, Narasimhan and Das (2001) find that purchasing integration positively moderates the relationship between purchasing and manufacturing departments and performance. High levels of integration is thus one indicator of a proactive and strategically aligned purchasing function, which is making a contribution to the firm's competitive advantage.

#### *2.4.4 Skills of the purchasing function.*

The skills required of purchasing professionals have also changed considerably over recent years. The role has moved from that of a buyer, focusing predominantly on price, delivery and quality, to that of purchasing professional managing strategic long-teem, complex agreements between internal stakeholders and suppliers (Faes et al., 2001). Performance metrics have similarly shifted from price reduction to total costs, and the role expanded to incorporate activities such as supplier coordination, supplier development, supplier market research, and cost analysis, sourcing strategy formulation, benchmarking and outsourcing decisions (Carr and Smeltzer, 2000). Collaborative relationships also require a more integrated way of working than in times past. These changes have necessitated the development of a different, more sophisticated, set of skills, competencies and approaches to manage in this intensely competitive environment (Cousins and Spekman, 2003). Various studies have sought to clarify what these skills might be (Anderson and Katz, 1998; Carr and Smeltzer, 1997; Giunipero and Percy, 2000; Giunipero et al., 2005).

The literature consistently states that before purchasing can be elevated to a strategic

level, the function needs to possess a strong set of these underlying skills and competencies (Carr and Smeltzer, 2000). We have argued that the supply chain management literature has distinguished purchasing configurations along a range of four dimensions: strategic planning, status, internal integration and skills level. Purchasing functions may, therefore, be identified according to their relative levels of achievement across these characteristics. The literature argues that different types of purchasing function characteristic will tend to lead to different performance outcomes (Carr and Pearson, 1999, 2002). Can and Pearson (1999) show how different supplier-buyer relationships can deliver differing levels of firm and financial performance. (Ellram and Billington, 2001) in their study of outsourcing decisions also found that the strategic focus of supply, or what we refer to as "purchasing configuration", can have an effect on the success of the chosen strategy.

## 2.5 Relative Performance Measurement

Neely et al. (1995) define performance measurement as the process of quantifying the effectiveness and efficiency of action. Effectiveness is the extent to which a customer's requirements are met, and efficiency measures how economically a firm's resources are utilized when providing a pre-specified level of customer satisfaction. Performance measurement systems are described as the overall set of metrics used to quantify both the efficiency and effectiveness of action. Neely et al. (1995) identify a number of approaches to performance measurement, including: the balanced scorecard (Kaplan and Norton, 1992); the performance measurement matrix (Keegan et al., 1989); performance measurement questionnaires (Dixon et al., 1990); criteria for measurement system design (Globerson, 1985); and, computer aided manufacturing approaches.

The excellent overview of performance measurement provided by Neely et al. (1995) has been widely cited in recent research into supply chain performance measurement systems and metrics (e.g. Beamon, 1999; Beamon and Chen, 2001, Gunasekaran et al., 2001, 2004). These, and other studies, have highlighted how the majority of the limitations cited by Neely et al. (1995) and his collaborators remain salient in the case of performance measurement systems for supply chains

### *2.5.1 Purchasing Performance Measurement*

As can be seen from the definitions of performance measurement, in order for an organization to achieve its goals to satisfy its customer, the two most fundamental dimensions of performance are efficiency and effectiveness (Kotter, 1978; Neely, 1999).

- Efficiency measures how successfully the inputs have been transformed into outputs.
- Effectiveness measures how successfully the system achieves its desired output.

The performance measurement system must span the same part of the supply chain that the purchasing department has control over. This part of the supply chain, spanning from suppliers to internal customers, is labeled 'the supply link'. The supply link consists of three main actors:

- (1) Suppliers;
- (2) The purchasing department; and
- (3) Internal customers/users.

The supply link consists of two main relationships:

- (1) The relationship between the purchasing department and the internal customer;
- (2) The relationship between the purchasing department and suppliers.

These components are illustrated in Figure 2.1.



*FIGURE: 2.1*

*Components of the supply chain/link*



Source: Kotter, 1978 and Neely, 1999

Many purchasing performance measurements have been studied. Most of the previous studied were about purchasing effectiveness and efficiency. Therefore, we choose the common measurement attributes to be discussed, as can be read in the following literature.

Cavinato and Kauffman (1999) have discussed ten different purchasing performance measurement areas in their handbook. Van Weele (2000) and Knudsen (1999) recommended measurement areas that are derived from purchasing effectiveness and purchasing efficiency. Purchasing effectiveness is defined as the extent to which, by choosing a certain course of action, a previously established goal or standard is being met. Further, purchasing efficiency is defined as the relationship between planned and actual sacrifices made in order to be able to realize a goal previously agreed upon.

As a consequence of these two definitions mentioned above, purchasing performance can be considered as the extent to which the purchasing function is able to realize its predetermined goals at the sacrifice of a minimum of the organization's resources. Hence, the four dimensions which measurement and evaluation of purchasing activities can be based on are: a price/cost dimension, a product/quality dimension, a logistics dimension, and an organization dimension.

The most important factor that determines the type of measurement for assessment of performance is the status of the purchasing department in the organization. Organizations where the purchasing departments have a low, clerical status seem to focus only on operational efficiency measures, while in organizations where the purchasing department has a higher status, combinations of both the operational efficiency measures and effectiveness-related measures are used.

.....

This construct was based on the objective criteria of Chao et al. (1993) for evaluating purchasing performance and includes quality of materials purchased, on-time delivery, and actual versus target materials' cost. This construct also includes an indicator that refers to materials' inventory performance and another referring to internal customer satisfaction.

### *2.5.2 Business Performance Measurement*

Carr and Pearson (1999) show how different supplier-buyer relationships can deliver differing levels of firm and financial performance. Production performance assessed the firm's performance on dimensions of product quality, delivery speed, delivery reliability and flexibility of production, using scales adapted from Carr and Smeltzer (2000). Financial performance was assessed on the basis of return on investment, return on sales, profit growth, and return on total assets (Carr and Pearson, 2002; Carr and Smeltzer, 2000).

Kohli and Jaworski (1990, p.13) list favorable business performance indicators as return-on-investment, profits, sales volume, market share and sales. Considerable empirical support for this positive relationship between market orientation and organizational performance has been found (Lee and Tsai, 2005; Baker et al., 1999; Pelham, 1999; Varadarajan and Jayachandran, 1999; Chan and Chau, 1998; Han et al., 1998; Avlonitis and Gounaris, 1997; Rapert et al., 1997; Pelham and Wilson, 1996; Atuahene-Gima, 1995; Cooper, 1995; Greenley, 1995; Raju et al., 1995; Slater and Narver, 1995; Wrenn et al., 1994; Jaworski and Kohli, 1993). Cano et al. (2004) conducted a meta-analysis of studies assessing the link between market orientation and business performance.

More recently, some authors also addressed performance measurement in the context of specific organizational problems faced by manufacturing organizations. In the process, they suggested specific methodologies and frameworks to address performance issues in relation to specific problems, such as processes and task flexibility (DSouza and Williams, 2000), effective management of environmental problems (Klassen and Whybark, 1999), ethical issues (Drongelen and Fisscher, 2003), and the special nature of some manufacturing environments (Ahmad et al., 2004).

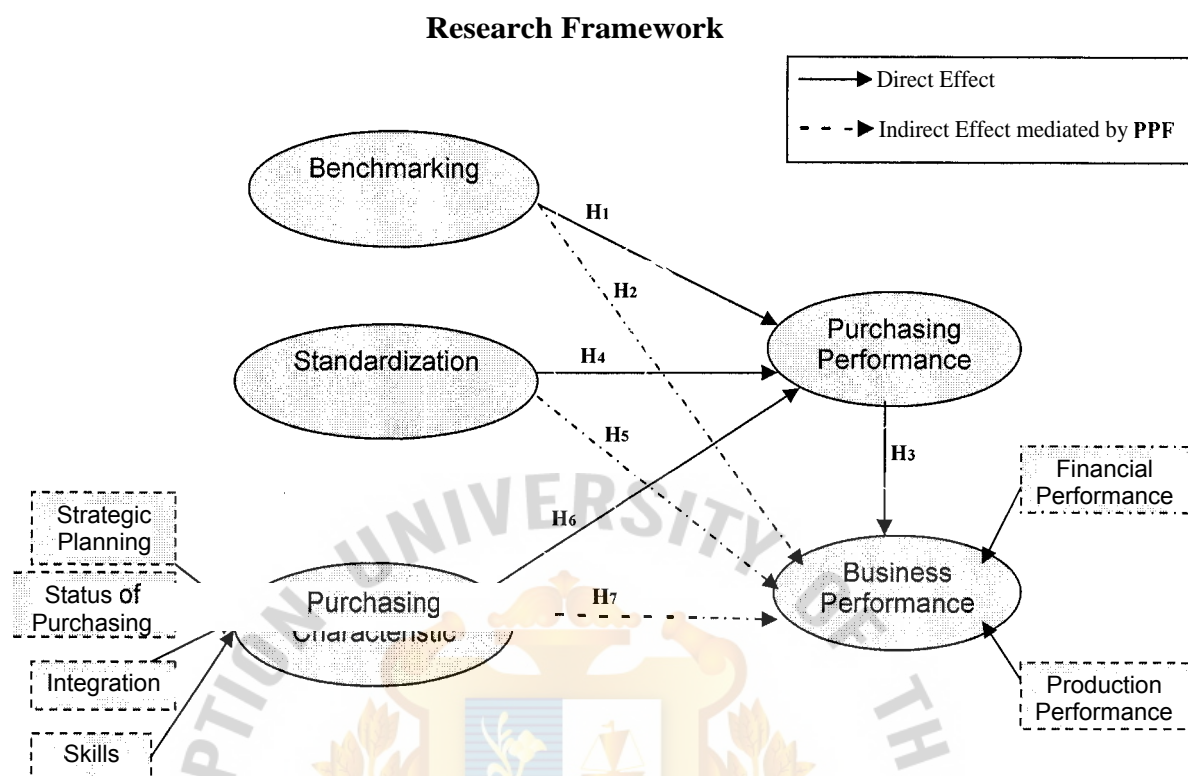
## CHAPTER III

### CONCEPTUAL FRAMEWORK & HYPOTHESES

In this chapter the researcher constructs the conceptual framework and hypotheses using sources that were carefully selected from various texts and journals described in Chapter 2. The proposed model in Figure 6 presents the conceptual framework under investigation. The model establishes the key latent variables (constructs) of the study benchmarking, standardization in purchasing, purchasing function characteristic, purchasing performance, and business performance as well as the relationships among them. The research methodology is described next.

As mentioned in Chapter 2, purchasing performance was based on the objective criteria of Chao et al. (1993) for evaluating purchasing performance and includes quality of materials purchased, on-time delivery, and actual versus target materials' cost. This construct also includes an indicator that refers to materials' inventory performance and another referring to internal customer satisfaction. Inventory performance is considered a common evaluation area of purchasing performance (Leenders et al., 2002). For business performance, the researcher measures two dimensions which are production performance and financial performance.

FIGURE: 3.1



Can and Smeltzer (1999) found in their empirical study a positive relationship between benchmarking in purchasing, strategic purchasing and business performance. Therefore it is hypothesized that benchmarking in purchasing has a positive impact on the firm's business performance. However, the effect of benchmarking on corporate performance can be direct and/or indirect, i.e. mediated by the positive effect of purchasing performance on corporate performance.

**H1. Benchmarking** has a positive impact on purchasing performance

**H2. Benchmarking** has a positive indirect impact (mediated by purchasing performance) on business performance.

A third hypothesis was enunciated in order to test H2. Business performance is the result of the actions of the individual business areas that comprise a company, i.e. production, marketing, finance, purchasing, etc.. Improvements in purchasing performance should have an effect on business performance. Thus, the hypothesis proposes a positive relationship between purchasing performance and business performance:



*H3. Purchasing performance has a positive impact on the firm's business performance*

In the research on "An empirical study on the impact of standardization of materials and purchasing procedures on purchasing and business performance (Cristo'bal et al., 2006) shown that standardization in purchasing has a significant positive effect on both purchasing and business performance. Thus, standardizing materials and purchasing procedures is important and may help firms to meet their materials expenditure targets, and increase the quality of materials, on-time delivery from suppliers, and inventory performance.

*H4. Standardization in purchasing has a positive impact on purchasing performance.*

Potentially, the most important finding of their research (as mentioned above) was that standardization in purchasing has an indirect effect on business performance. Since business performance was affected by a large number of factors, it was not surprising that the effect of standardization in purchasing on business performance is small.

*H5. Standardization in purchasing has a positive indirect impact (mediated by purchasing performance) on business performance.*

The literature argues that different types of purchasing configuration will tend to lead to different performance outcomes (Carr and Pearson, 1999, 2002). Ellram and Billington (2001) in their study of outsourcing decisions also found that the strategic focus of supply, or what we refer to as "purchasing configuration", can have an effect on the success of the chosen strategy. Purchasing can also have a significant impact on firm overall performance (Chen et al., 2004). These different configurations of purchasing characteristics will result in varying levels of performance along the dimensions of supplier integration, supplier relationship outcomes, product performance and financial performance.

*H6. Purchasing Function 's characteristics have a positive impact on purchasing performance.*

*H7. Purchasing Function 's characteristics have a positive indirect impact (mediated by purchasing performance) on business performance.*

## CHAPTER IV

### RESEARCH METHODOLOGY

This chapter will guide the reader through the research methodology. It will include the data collection method, the sampling design, and determination of the sample size, and data analysis techniques. All factors have been included and evaluated from the survey. The researcher used the conceptual framework to design and develop an understanding of how benchmarking, standardization and purchasing characteristic impact on the purchasing and business performance.

#### 4.1 Methods of Research Used

The researcher conducted both qualitative and quantitative data analysis to investigate the relationship of all factors. Firstly, in the qualitative analysis, the researcher gathers the information from the discussion among the purchasing manager and those who work relates to the purchasing field. But there was a lack of feedback because most of these people did not realize the benefit of answering the questions.

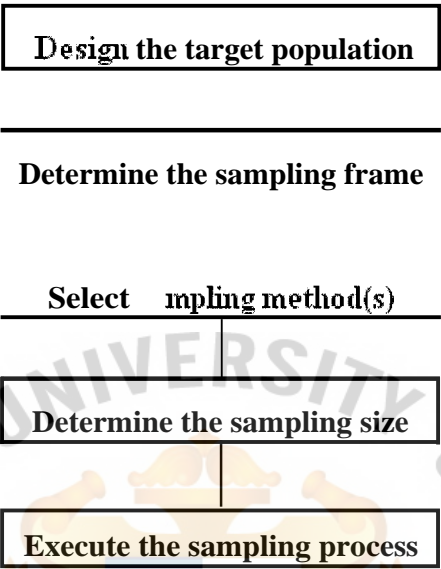
Then secondly, the researcher continued with quantitative analysis. The researcher decided to gather information by using a questionnaire survey to test or simulate or evaluate the hypothetical relationship between benchmarking, standardization, purchasing characteristic, purchasing performance and business performance.

#### 4.2 Sampling Design Process

The sampling design process includes five steps, which are shown sequentially in Figure 4.1:

FIGURE: 4.1

The Sampling Design Process



Source: Malthotra et al. (1996)

4.2.1 Target population

A group of firms within the Thailand Food and Beverage Industry which is the biggest sector to represent the whole of the Thailand Fast Moving Consumer Goods (FMCG) industry. As mentioned in Chapter 1, we can see that the proportion of the Food and Beverage sector represents around 30 percent of the Thailand Fast Moving Consumer Goods (FMCG) industry.

4.2.2 Sampling Frame

Sampling is defined as a procedure using a small number of units of a given population as a basis for drawing conclusions about the whole population (Zikmund, 1999)

The target population of this study comprised mainly those involved in purchasing, sourcing and those who work in supply chain field and are familiar with purchasing function in the Thailand Food and Beverage industry.

#### 4.2.3 Sampling Method

A probabilistic sampling method is used in this study due to the preference for probabilistic sampling over the non-probabilistic sampling in scientific study (Sekaran, 1992). A simple random sampling technique will be employed to gather the data in this study. The sample population of 260 was randomly selected by the researcher.

#### 4.2.4 Sample size

The sample size used in structural equation modeling is perhaps the most influential single element under the control of the researcher in designing the analysis. The effects of sample size are seen most directly in the statistical power of the significance testing and the generalizability of the result. The size of the sample has a direct impact on the appropriateness and the statistical power of the Structural Equation Model (Hair et al. 1998).

A list of around 260 respondents from the industry, comprised of supply chain managers; purchasing managers/supervisors, was included in the sampling frame. In a Sampling Size (Hair et al. 1998) a minimum 5 times of one parameter is required for Structure Equations Modeling. Thus, the research used 20 respondents per parameter. This research comprised 11 parameters including Benchmarking, Standardization, Purchasing Function Characteristic, Purchasing Performance, Business Performance, Strategic Purchasing, Purchasing Status, Internal Integration, Purchasing Skills, Perceived Production Performance and Perceived Financial Performance. *Sample Size* =  $11 \text{ parameters} \times 20 \text{ per parameter} = 220 \text{ samples}$ .

However, this is a relatively small sample size, and, as Byrne (1998) points out, the CFI and incremental-fit index (IFI) are more appropriate when the sample size is small.

#### 4.2.5 Research Instrument

The main research instrument was adopted from the initial designed questionnaire based on previous studies. The researcher developed scales based on several other empirical studies to make an initial list of items. Then the researcher tested the first draft of the questionnaires with a pilot group consists of 30 people who work as



purchasing managers and supply chain managers.

The questionnaire was designed in English and was revised after pre-tests with 30 respondents. Comments were collected and modifications were made in the design of the final survey instrument.

The questionnaires were distributed to all managers, or equivalent managers and supervisors of each selected company, and included a self-introduction letter and instructions on how to complete the questionnaire. Respondents were asked to indicate agreement with statements related to demonstrating the relationship of benchmarking, standardization, purchasing characteristic, purchasing performance and business performance. Respondents were asked to rate their level of agreement on a five-point Likert scale, where 1 represented "strongly disagree" and 5 represented "strongly agree". Additionally, three elements of business performance were measured by the position of their company with respect to its competitors on a five-point scale, where 1 represented "well below" and 5 represented "well above". This was followed by quantitative analysis consisting of correlation analysis, reliability evaluation (using item-to-total correlations as well as Cronbach's alpha and principle component and confirmatory factor analysis.

#### *4.2.6 Survey design and Data collection*

The prospective respondents were selected and we had to ensure that they were actually in the given industries. Then each respondent was asked to fill in the questionnaire and return to the researcher's email address, or by hand, after completing it on his/her own so that no individual questionnaire could be associated with any specific respondent and hence anonymity is assured.

The researcher recruited participants who met the selection criteria through peer groups, classmate and colleagues. Then prospective participants were informed about research details as described in the questionnaire.

The research questionnaire was structured as follows;

Part 1 – General Instruction and Definition of Terms

Part 2 – Questions consist of Benchmarking, Standardization, Purchasing Characteristic, Purchasing Performance and Business Performance.

### • Part 3 – Demographic Details

Each of these steps yielded unique insights into the conceptual framework. The first step required only basic statistical analysis techniques. The second and third steps requires a far more sophisticated and rigorous approach to the analysis.

The study used multiple techniques of data collection to ensure that the response in terms of respondent rate on the completed questionnaires should reach the sample size of 290 of the total distribution. Techniques used in this study were;

Data was collected by emailing and handing the questionnaire to prospective respondents through peers and self in the industry.

Encouraging the participating firms by promising a summary of the findings on completion of the study.

Calling up the respondents prior to the arrival for data collection, and request an appointment at their earliest convenient time.

Respondents are supervisors / managers, or equivalent, in Supply Chain Management and across all functions, who are knowledgeable regarding the purchasing and sourcing activities within the organization.

## 4.3 Statistical Analysis

### 4.3.1 Data Coding and Cleaning

Data coding and cleaning was done through SPSS version 15.

### 4.3.2 Assessment of Internal Consistency

Assessing internal consistency of the measures involved examining two independent but related concepts: Unidimensionality and Reliability.

#### 4.3.2.1 Unidimensionality

It exists when all items belonging to an underlying trait can be shown to group together using a technique such as factor analysis.

#### 4.3.2.2 Reliability Assessment

It is assessed after unidimensionality has been established, and measures the amount of error present (or absent) in the item grouping. Cronbach's (1951)  $\alpha$  (alpha) and Fornell and Larcker's (1981) measure of internal consistency were calculated to determine reliability.

#### ***Cronbach's $\alpha$ Measure for reliability Assessment***

Establishing construct reliability shows that each of the multiple indicators of a construct appropriately co-vary. The traditional measure of reliability is Cronbach's  $\alpha$  (Nunnally and Bernstein 1994) which assumes that the indicators are measured without error. Values for Cronbach's  $\alpha$  range from 0 to 1 with  $\alpha$  values greater than 0.70 considered acceptable (Nunnally and Bernstein 1994). Cronbach's  $\alpha$  was calculated for each of the constructs in the model. If  $\alpha$  was less than 0.70, items that caused a significant drop in  $\alpha$  and was deleted. The value for  $\alpha$  was recalculated until an acceptable level could be obtained.

#### ***4.3.3 Data Analysis Strategy***

One of the primary objectives of multivariate techniques is to expand the researcher's explanatory ability and statistical efficiency. Multiple regressions, Factor Analysis, Multivariate Analysis of Variance, Convergent validity, Discriminant Analysis, and the other techniques, all provide the researcher with powerful tools for addressing a wide range of managerial and theoretical conceptualized framework. But they all share one common limitation: each technique can examine only a single relationship at a time. Even the techniques allowing for multiple dependent variables, such as multivariate analysis of variance and canonical analysis, still represent only a single relationship between the dependent and independent variables. For this reason the researcher examined the technique of Structural Equation Modeling (SEM), an extension of several multivariate techniques, most notably multiple regression and factor analysis (Hair et al. 1998).

#### *4.3.3.1 Confirmatory Factor Analysis (CFA) Validity*

This seeks to determine if the number of factors and the loading of measured (indicator) variables on them conform to what is expected on the basis of pre-established theory. A minimum requirement of confirmatory factor analysis is that one hypothesis beforehand the number of factors in the model, but usually also the researcher will posit expectations about which variables will load onto the factors (Kim and Hwang, 1992). The researcher seeks to determine, for instance, if measures created to represent a latent variable really belong together.

Confirmatory factor analysis can also mean the analysis of an alternative measurement (factor) model using a structural equation modeling package such as AMOS or LISREL. While SEM is typically used to model causal relationships among latent variables (factors), it is equally possible to use SEM to explore CFA measurement models.

#### *4.3.3.2 Structural Equation Modeling (SEM)*

Structural equation modeling (SEM) is a statistical technique that combines elements of both multiple regression and factor analysis. SEM is often used to specify the phenomenon under study in terms of linkage between constructs and their indicators, and provides the researcher with a straightforward method of dealing with multiple relationships simultaneously while providing statistical efficiency. SEM was the primary statistical technique used to analyze the survey data in this study due to the advantages it has over traditional Regression methods. SEM provides a predictive validity, an integration of path analysis and factor analysis. SEM incorporates observed (indicator) and unobserved (latent) variables. The measurement models specify how the latent variables are measured in terms of the indicator variables as well as address the reliability and validity of the indicator variables in measuring the latent variables or hypothesized constructs. The Structural Equation Model provides an assessment of predictive validity, specifies the direct and indirect relations among the latent variables, and describes the amount of explained and unexplained variance in the model (Byrne n1998).



In SEM there is no single test of significance that can absolutely identify a correct model given the sample data. Many goodness-to-fit criteria have been established to assess an acceptable model fit. Consequently, several authors recommend presenting a number of indices to support model fit (Bentler et al.1987).

#### *4.3.4 Method of Analysis*

##### *4.3.4.1 Structural Equation Analysis Model (SEM)*

In this study the researcher used the Structural Equation Modeling Model (SEM) as a primary statistical technique used to analyze the survey data due to the advantages it has over traditional regression methods. It provides the researcher with a comprehensive means for assessing and modifying theoretical models (Anderson and Gerbing 1988).

SEM is particularly useful when one dependent variable becomes an independent variable in a subsequent dependent relationship. The hypothesized model can be tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data (Byrne 1998; Hair et al., 1998). Thus SEM will be used in this study because of its ability to accommodate the multiple interrelated dependence relationship is a single model and the ability to represent unobserved concepts in the relationships and account for measurement error in the estimation process.

SEM provides statistical efficiency and its ability to assess the relationships comprehensively has provided a transition from exploratory to confirmatory analysis (Hair et al., 1995). Also, SEM techniques allow researchers to examine the measurement and structural properties of a theoretical model. Thus, SEM techniques are particularly appropriate for the study of multiple dependence relationships such as those investigated in this research.

##### *4.3.4.2 Analysis of Moment Structures (AMOS)*

AMOS Data Analysis Software is a powerful and easy-to-use structural equation modeling (SEM) software.

AMOS creates structural equation models by extending standard multivariate analysis methods, including multiple regression models, with observed and latent variables. AMOS also has a basic programming interface as an alternative. AMOS builds a model that more realistically reflects complex relationships because it "satisfaction" or "loyalty") to predict any other numeric variable. Also Structural Equation Modeling, sometimes called path analysis, can help gain additional insight into causal models and the strength of variable relationships.



## CHAPTER 5

### DATA ANALYSIS

This chapter will present results from the data gathered from the respondents from the industry which comprised of supply chain managers; purchasing managers and supervisors. Also, this section will include the survey response rate, respondent demographics, reliability assessment, confirmatory factor analysis, structural equation model analysis, and hypotheses testing.

#### 5.1 Survey Responses

The survey was activated using a list of 260 respondents from the industry comprising the supply chain managers; purchasing managers/supervisors and those who work very closely with the purchasing function. The data was collected by emailing or handing the questionnaire to prospective respondents through peers and self in the industry. Typically, these are the decision maker of the firms on supply chain functions who are most knowledgeable about the firms' functional activities as indicated by their positions, which were established before the questionnaire was handed to them. Participating firms were encouraged to participate by promising a summary of the findings on completion of the study. Therefore, before the questionnaires were distributed, the researcher telephoned or emailed the respondents prior to arrival for data collection; and requested an appointment at their convenient time.

**TABLE 5.1**  
**SURVEY RESPONSE RATE**

	Manufacturing Firm Operating in Thailand	<u>Total</u>
<b>Total Number of Questionnaires</b>	<b>260</b>	<b><u>100</u></b>
<b>1. Total Completed Questionnaires</b>	99	<b>38</b>
<b>1.1 Total Valid Questionnaires for Data Analysis</b>	89	<b>35</b>
<b>1.2 Total Late Responses</b>	10	<b>3</b>
<b>2. Total Uncompleted Questionnaires</b>	4	<b>1.5</b>
<b>Response Rate</b>		<b><u>38 %</u></b>

A total of 260 questionnaires were sent, and only 113 completed surveys were returned, of which only 4 surveys were usable. The constraint on data collection is described in the part on research limitations in Chapter 6. Table 5.1 shows the distribution and summary responses. The overall response rate was 38 %.

**Non-Response Biases**

The approach consisted of comparing early with late respondents (i.e. first and second mailing) following Armstrong and Overton's (1977) recommendations. No significant differences were found between early and late respondents on all variables, which includes Company Size, Benchmarking, Standardization in Purchasing Function, Purchasing Function Characteristics, Purchasing Performance and Business Performance.



**TABLE 5.2**  
**Comparison of Early and Late Responses**

<i>Construct</i>	<i>F-Statistics: Test for Equality of Variances</i>	<i>T-Statistics: Test for Equality Variances Assumed</i>	<i>T-Statistics: Test for Equal Variances</i>
	<i>Assumed (P-value)</i>	<i>(P-value)</i>	<i>Not assumed (P-value)</i>
Company size	0.209 (0.649)	-1.865 (0.065)	-1.677 (0.123)
Benchmarking	0.035 (0.852)	0.498 (0.62)	0.626 (0.542)
Standardization in Purchasing Function	0.049 (0.825)	-0.258 (0.797)	-0.245 (0.811)
Purchasing Function Characteristics	1.625 (0.205)	0.363 (0.718)	0.595 (0.559)
Purchasing Performance	1.66 (0.201)	-0.345 (0.731)	-0.529 (0.604)
Business Performance	1.674 (0.199)	-0.968 (0.335)	-1.232 (0.24)

\* Significant at 0.05 confidential levels.

To determine the non-response biases in the data, in this study we applied the statistics significant differences to test those who responded both early and late (Armstrong and Overton 1977; Lambert and Harrington 1990). All the survey responses were separated into two groups; early response and late response. The f-test and t-test were performed to see the significant differences between these two groups. The result is shown below on the table 5.2. These results showed that non-response bias did not significantly impact the study.

5.2 Respondent Demographics Profile

The summaries of respondent profiles includes a description of respondent firms (Table 5.3). Over 80 %, of the firms classified themselves as manufacturing firms. A large percentages of the respondents (approximately 60%) have been operating their business in Thailand for between 11-50 years. Around 46% had over 500 employees, while 17% had fewer than 500 employees. All respondent were definitely in the Thailand Food and Beverage Industry.

TABLE: 5.3  
A description of the respondent firms

<i>Demographic Profile</i>	<i>Number of respondents</i>	<i>Percentage of respondents</i>
Main operation		
Distributor	6	6.1
Manufacturing	87	87.9
Wholesaler	2	2
Retailer	3	3
Other	1	1
Products		
Milk Producer	17	17.2
Coffee	7	7.1
Beer	11	11.1
Snack	13	13.1
Fruit Juice	13	13.1
Frozen food	6	6.1
Instant food	1	1
Ice cream	4	4
Flavor and Fragrance	1	1
Multiple kind of food and beverage	14	14.1
Tobacco	3	3
Liquor	2	2
Creamer	2	2

Drinking Water	5	5.1
Company size		
500 or less	36	36.4
501 - 2,500	46	46.5
2,500 or more	17	17.2
Company Age		
10 or less	17	17.2
11 -50	63	63.6
50 or more	19	19.2

A description of the organizations' partnerships (Table 5.4) shows the general feedback from the survey result and will be discussed below each table.

**TABLE: 5.4**  
**A description of organizations' partnerships**

<i>Organization's Partnership</i>	<i>Number of respondents</i>	<i>Percentage of respondents</i>	<i>Percentage of respondents</i>
Partnership-supplier	81	81.8	29.2
Partnership-distributor	83	83.8	30.0
Partnership-manufacturer	77	77.8	27.8
Partnership-wholesaler	13	13.1	4.7
Partnership-retailer	19	19.2	6.9
Partnership-others	4	4.0	1.4
Total	277	279.7	100.0

The above table shows that the respondents' profiles also showed that their partnership within the industry was comprised of relationships with their supply chains, both upstream and downstream, i.e. manufacturer, wholesaler, other, retailer, supplier, and distributor. Most of the organization had partnerships with a distributor (30.0 percent).

5.3 Reliability Assessment

Since the data for this research was generated using scaled responses, it was deemed necessary to test for reliability. Cronbach Alpha tests were performed on the eleven constructs and the full model (in Table 5.5). Based on the coefficient values, the items

tested were deemed reliable for this type of research under the theory that says that values for Cronbach’s a range from 0 to 1 with a – values greater than 0.70 are considered acceptable (Nunnally and Bernstein 1994).

**TABLE: 5.5**  
**Research Constructs**

<i>Construct/item</i>	<i>No. of Items</i>	<i>Cronbach’s Alpha</i>
<b>Benchmarking</b> in purchasing function	3	0.923
Standardization function characteristic	2	0.816
Purchasing function characteristic		
STP: Strategic Planning	5	0.813
PCS: Purchasing Status	3	0.730
ITI: Internal Integration	6	0.895
PCS: Purchasing Skills	4	0.916
Purchasing performance	5	0.924
Business performance		
PRO: Perceived - Production Performance	4	0.915
FIN: Perceived - Financial Performance	4	0.917

From the results shown in Table 5.5, we can see that all the Cronbach’s Alpha of each construct, including Benchmarking, Standardization, Purchasing function Characteristic, Purchasing Performance and Business Performance, were greater than 0.70. So, the t-tests yielded no statistically significant differences among the survey items tested. These results suggest that a non-response bias did not significantly impact the study (Nunnally and Bernstein 1994).

All final results of all constructs and models were deemed reliable as shown in Table 5.6.



**TABLE: 5.6**  
**SUMMARY OF RELIBILITY ANALYSIS**  
**Benchmarking in purchasing function, Standardization function and**  
**Purchasing characteristic**

<i>Construct/item</i>	<i>Mean</i>	<i>SD</i>
<b>BMK: Benchmarking</b> (Reliability =.923)		
BMK1: We gathers information about prices and level of quality of purchases of other companies in our industry	3.91	0.846
BMK2: We analyze the purchasing process of other companies to improve our own purchasing process	3.94	0.831
BMK3: There is a formal procedure to compare our performance with the purchasing performance of other companies	3.81	0.877
<b>SDD: Standardization in Purchasing Function</b> (Reliability =.816)		
SDD1: We make intensive use of standardization of raw materials and parts.	4.02	0.685
SDD2: We make intensive use of standardization purchasing procedures.	3.98	0.714
<b>STP: Strategic Planning</b> (Reliability =.813)		
STP1: Purchasing is included in the firm's long strategic planning process	4	0.769
STP2: Purchasing performance is measured in terms of its contributions to firm's success	3.97	0.775
STP3: Purchasing professionals' development focuses on the elements of the competitive strategy	3.93	0.759
STP4: Purchasing focus is on longer term issues that involve risk and uncertainty	3.96	0.669
STP5: The purchasing function has a formally written long range plan	3.72	0.783
<b>PCS: Purchasing Status</b> (Reliability =.730)		
PS1: Top management is supportive of our efforts to improve the purchasing department	3.88	0.718
PS2: In this company, purchasing is considered a vital part of our company strategy	3.74	0.921
PS3: Purchasing views are considered important in most top managers' eyes	3.93	0.773
<b>ITI: Internal Integration</b> (Reliability =.895)		
ITI1: Purchasing regularly attends strategy meetings	3.73	0.913
ITI2: Purchasing recommends and initiates changes in end products and inputs, based on supply market analysis	3.68	0.924
ITI3: A high proportion of purchasing personnel spend time in market and price/cost analysis	3.86	0.869
ITI4: Purchasing participates in new product design	3.73	0.89
ITI5: Purchasing participates in process design and improvement	3.63	0.84
ITI6: Purchasing is measured on strategic contributions to the company (e.g. new products/technologies), versus cost and efficiency contributions	3.69	0.865
<b>PCS: Purchasing Skills</b> (Reliability =.916)		
PCS1: Purchasing professionals have the necessary skills to monitor and interpret changes in the supplier market/product base	3.99	0.749
PCS2: Purchasing professionals have the technical capabilities to help our suppliers improve their processes and products	3.92	0.817
PCS3: Purchasing professionals have the necessary skills to improve the firm's total cost of doing business with the firm's suppliers	4.04	0.727
PCS4: Purchasing professionals demonstrate perseverance, imagination, decisiveness and interpersonal skills	4.01	0.789

TABLE: 5.6 (cont.)

SUMMARY OF RELIBILITY ANALYSIS

Purchasing performance and Business performance

Construct/item	Mean	SD
<b>PPF: Purchasing Performance (Reliability =.924)</b>		
PPF1: Most of raw materials and parts received are in conformance with specifications	4.05	0.747
PPF2: All raw materials and parts arrive within the delivery date	3.86	0.783
PPF3: the quantity of materials purchased in inventory meets the company's quantity performance goals	3.88	0.836
PPF4: Purchasing meets its materials' target cost (standard cost or budgeted cost).	3.81	0.778
PPF5: Customer departments are satisfied with the level of attention and commitment shown by purchasing when there is a problem	3.85	0.761
<b>Business performance</b>		
<b>PRO: Perceived - Production Performance (Reliability =.915)</b>		
PRO1: Product quality	3.78	0.678
PRO2: Delivery speed	3.79	0.674
PRO3: Delivery reliability	3.77	0.652
PRO4: Flexibility of production	3.75	0.690
<b>FIN: Perceived - Financial Performance (Reliability =.917)</b>		
FIN1: Return on investment	3.71	0.659
FIN2: Return on sales	3.70	0.630
FIN3: Profit growth	3.71	0.746
FIN4: Return on total assets	3.68	0.652

TABLE: 5.7

Meaning of the Symbols

Variables	Meaning	
BP	Mean to	BP : BUSINESS PERFORMANCE
1. FIN	Mean to	FIN: Perceived - Financial Performance
2. PRO	Mean to	PRO: Perceived - Production Performance
BMK	Mean to	<b>BMK: Benchmarking</b>
1.BMK1	Mean to	BMK1: We gathers information about prices and level of quality of purchases of other companies in our industry
2.. BMK2	Mean to	BMK2: We analyze the purchasing process of other companies to improve our own purchasing process
3. BMK3	Mean to	BMK3: There is a formal procedure to compare our performance with the purchasing performance of other companies
SSD	Mean to	<b>SDD: Standardization in Purchasing Function</b>
1. SSD1	Mean to	SDD1: We make intensive use of standardization of raw materials and parts.
2. SSD2	Mean to	SDD2: We make intensive use of standardization purchasing

<i>Variables</i>		<i>Meaning</i>
PFC	<i>Mean to</i>	procedures. <b>PFC : PURCHASING FUNCTION CHARACTERISTIC</b>
1. STP	<i>Mean to</i>	STP: Strategic Planning
2. PS	<i>Mean to</i>	PS: Purchasing Status
3. ITI	<i>Mean to</i>	ITI: Internal Integration
4. PCS	<i>Mean to</i>	PCS: Purchasing Skills
PPF	<i>Mean to</i>	<b>PPF: Purchasing Performance</b>
1. PPF1	<i>Mean to</i>	PPF1: Most of raw materials and parts received are in conformance with specifications
2. PPF2	<i>Mean to</i>	PPF2: All raw materials and parts arrive within the delivery date
3. PPF3	<i>Mean to</i>	PPF3: the quantity of materials purchased in inventory meets the company's quantity performance goals
4. PPF4	<i>Mean to</i>	PPF4: Purchasing meets its materials' target cost (standard cost or budgeted cost).

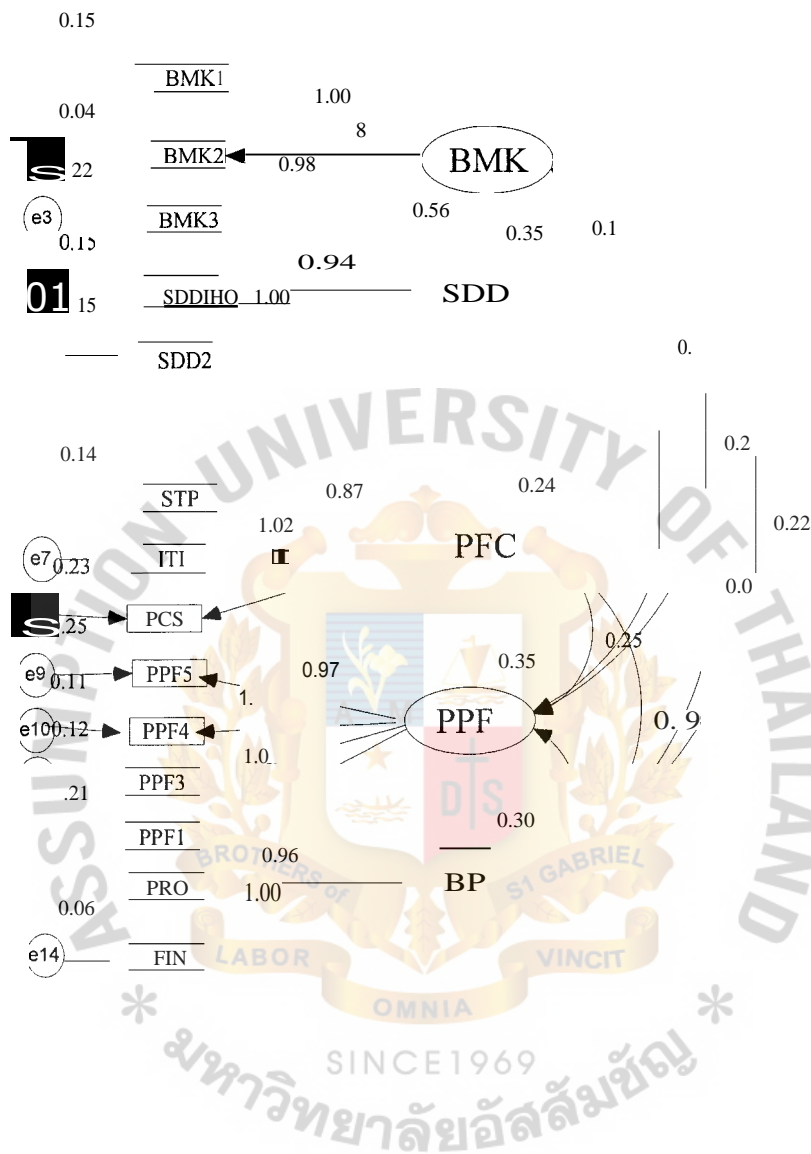
The symbols are used to represent the variable description for all the Figures and Tables presented in this paper. So, Table 5.7 is a guide to the meaning of each variable in each Table or Figure.

#### 5.4 Analysis of Measurement Model (Confirmatory Factor Analysis -CFA)

Multiple fit indexes should be used in reporting model fit, since different types of indexes measure different aspects of model fit (Bollen and Long, 1993). A confirmatory factor analysis (CFA) using AMOS a version 7.0 package was used to test the measurement model. To evaluate the fit of CFAs, several goodness-of-fit indicators were used to assess the model's goodness of fit including the ratio of X to degrees-of-freedom (df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), non-normalized fit index (NFI), comparative fit index (CFI). Some items were removed to make the model fit to the ratio and to be ready for the next analysis. It was necessary to remove BMK1, SDD3, PPF2 and PS to achieve unidimensionality.

FIGURE 5.1

Framework Correlation



Fit Measure	Recommended Values		Output
<b>x2/df</b>	>3.00	Chau (1997)	2.19
<b>GFI</b>	>0.9	Byrne (1998)	0.846
<b>NFI</b>	>0.9	Byrne (1998)	0.865
<b>CFI</b>	>0.9	Byrne (1998)	0.92
<b>RMR</b>	>0.03	Bentler and Chou (1987), Bollen (1989)	0.031
<b>IFI</b>	>0.9	Byrne (1998)	0.922



When viewing the model fit indices that had the correlation across all the items as shown in Figure 5.1, a good fit is apparent regarding each of the fit measures. As shown in Figure 5.1, the  $\chi^2$  of 147 (degree of freedom = 67) is significant at  $p = 0.000$ , and  $\chi^2/df$  was 2.190, was less than 3.0 Chau (1997), suggesting the model fit the sample data suggested by the structural equations model (SEM) literature (see Bollen and Long, 1993; Joreskog and Sorbom, 1993; Kline, 1998). The following Goodness-of-fit, comparative Fit Index (CFI), and Incremental Fit Index (IFI) were at 0.846, 0.920 and 0.922 respectively; only GFI was not greater than 0.90, but Byrne (1998) points out that, the CFI and incremental-fit index (IFI) are more appropriate when the sample size is small. So, even other indices fit well with the CFI (0.920) and IFI (0.922) as both exceed the recommended 0.90 level. Root Mean Square Residual (RMR) was at 0.03, and thus equal to 0.03 (Bentler and Chou 1987, Bollen 1989). Therefore this value was indicative of good fit for the construct as well.

#### 5.4.1 Convergent Validity

Convergent validity is demonstrated when a set of alternative measures accurately represents the construct of interest (Churchill, 1979). Once the CFA model fit was established for each of the constructs in the study, the convergent validity was assessed based on the level of significance for the factor loadings. If all the individual item factor loadings are significant, then the indicators are effectively converging to measure the same construct (Anderson and Gerbing, 1988). The coefficients for all indicators in the constructs should be large and significant ( $p < 0.01$ ), providing strong evidence of convergent validity. Similarly, the coefficients for the indicators in the constructs were also large and significant ( $p < 0.01$ ). In addition, since each of the CFA models demonstrated good fit, each of the constructs is unidimensional.

TABLE 5.8

Regression Weights

			Standard Coefficient	Standard Error	Critical Ratio.	P value
<b>BMK2</b>	<---	<b>BMK</b>	1.075	0.07	15.281	***
<b>BMK3</b>	<---	<b>BMK</b>	0.985	0.084	11.698	***
<b>SDD1</b>	<---	<b>SDD</b>	0.943	0.203	4.642	***
<b>ITT</b>	<---	<b>PFC</b>	1.021	0.151	6.758	***
<b>STP</b>	<---	<b>PFC</b>	0.868	0.12	7.227	***
<b>PPF3</b>	<---	<b>PPF</b>	1.287	0.124	10.41	***
<b>PRO</b>	<---	<b>BP</b>	0.959	0.104	9.203	***
<b>PPF5</b>	<---	<b>PPF</b>	0.967	0.119	8.101	***
<b>PPF4</b>	<---	<b>PPF</b>	1.186	0.115	10.281	***

The critical ratio and p-value are within the suggested range for all constructs including Benchmarking, Standardization, Purchasing Characteristic, Purchasing Performance and Business Performance as presented in table 5.10. Critical Ratios (C.R.) showed very positive signs for all and were large, and the significant level for all was at  $p<0.001$ . Convergent validity is demonstrated when a set of alternative measures accurately represents the construct of interest (Churchill, 1979). One CFA model fit was established for each of the constructs in the study, the convergent validity was assessed based on the level of significance for coefficients. If all the individual construct coefficients are significant, then the indicators are effectively converging to measure the same construct (Anderson and Gerbing, 1988). Therefore, coefficients for all constructs in the model were large and significant ( $p>0.001$ ), providing strong evidence of convergent validity.

5.4.2 Discriminant validity

Discriminant validity among the latent variables and their associated measurement variables can be assessed by fixing (i.e. constraining) the correlation between pairs of constructs to 1.0, then re-estimating the modified model (Segars and Grover, 1993). This procedure essentially converts a two-construct model into a single-construct model. The condition of discriminant validity is met if the difference of the chi-square statistics between the constrained and standard models is significant (1 d.f.). The chi-square difference tests indicated that discriminant validity exists among all of the

constructs. Also as procedure recommended by Anderson (1987) and Bagozzi and Phillips (1982), pairs of constructs were assessed in a series of two-factor models using AMOS 7.0. Each model was run twice, once constraining the phi coefficient to unity and once freeing the parameter. A Chi-square difference test was then performed on the nested models to assess if the chi-square values were significantly lower for the unconstrained models (Anderson and Gerbing 1988).

**TABLE: 5.9**

**Discriminant Validation**

	Chi-Square statistic						
	Constrained			Unconstrained			p <sup>-</sup> value
	Correlation	model	(df)	model	(df)	Difference	
<b>Benchmarking with;</b>							
Standardization	0.43	1.7	4	47.3	5	45.6	0.000
Purchasing Function Characteristic	0.74	12.1	8	50.9	9	38.8	0.000
Purchasing Performance	0.47	33.5	13	77.7	14	44.2	0.000
Business Performance	0.55	9	4	300.2	6	291.2	0.000
<b>Standardization with;</b>							
Purchasing Function Characteristic	0.42	7.5	4	58.7		51.2	0.000
Purchasing Performance	0.26	11.1	8	85.2	9	74.1	0.000
Business Performance	0.23	14.9	8	294.7	7	279.8	0.000
<b>Purchasing Function Characteristic with;</b>							
Purchasing Performance	0.87	18.2	13	58.3	14	40.1	0.000
Business Performance	0.70	12.2	4	184.6	6	172.4	0.000
<b>Purchasing Performance with;</b>							
Business Performance	0.64	7.9	8	298.7	5	290.8	0.000

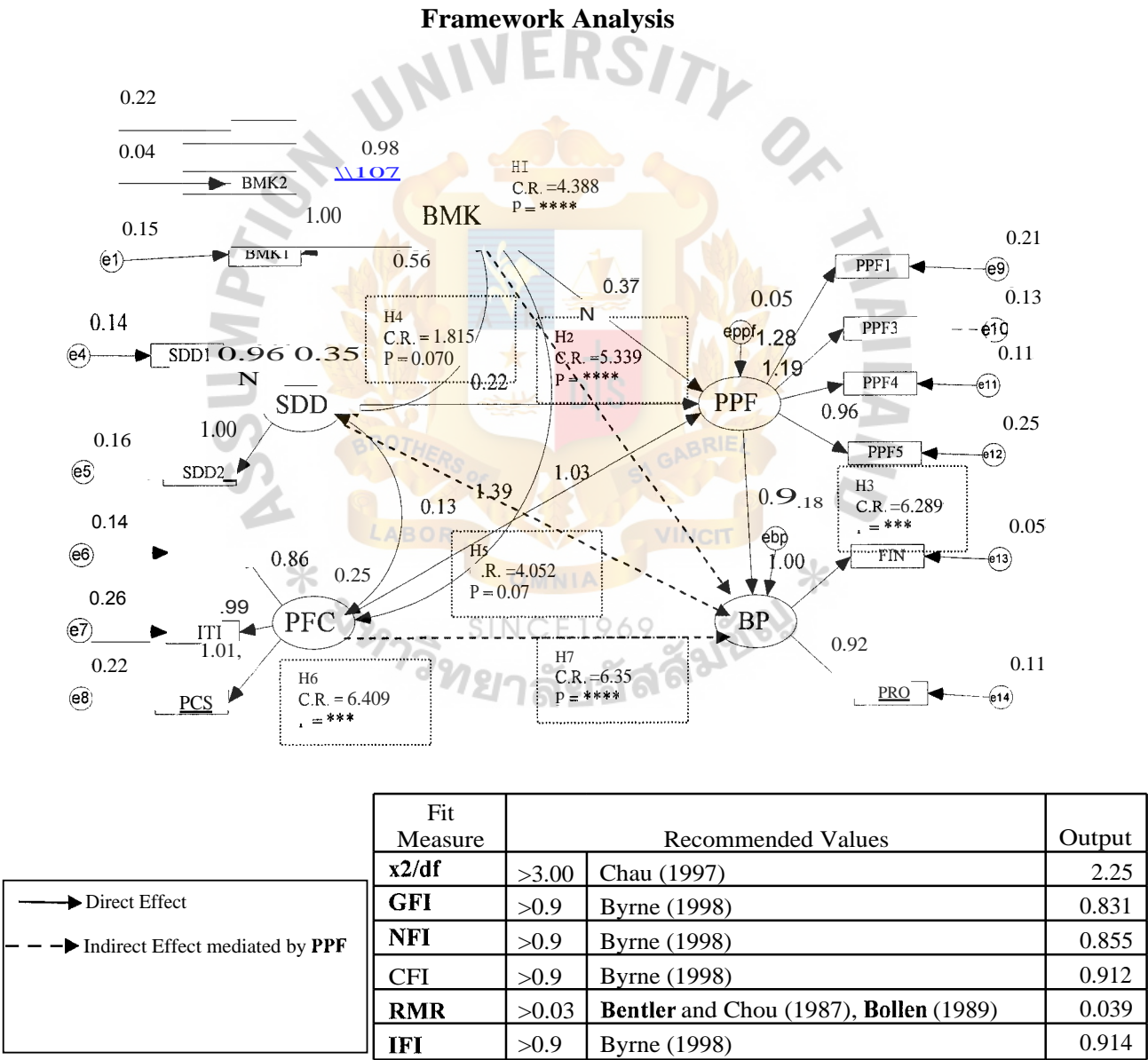
The chi-square difference tests indicated that discriminant validity exists among all of the constructs comprising the Benchmarking, Standardization, Purchasing Characteristic, Purchasing Performance and Business performance ( $p < 0.01$ ), and the chi-square values were significantly lower for the unconstrained models (Anderson and Gerbing 1988). Therefore there exists discriminate validity among the constructs under investigation in this study.

To ensure the fitness of the model, the researcher further conducted the analysis SEM to identify and ensure a good result.

5.5 Analysis of Structural Equation Model and Hypotheses

Prior to accessing the study's hypotheses, the model's overall fit must be established (Bollen and Long, 1993). The results of the structural model estimation are shown in Figure 5.2. The structural equation model was analyzed based on the research constructs; Maximum Likelihood Estimation (MLE) was used to fit the structural model.

FIGURE 5.2





As shown in Figure 5.2, the model's chi-square statistic was significant, the  $\chi^2$  of 157.5 (degree of freedom = 70) is significant at  $p = 0.000$ , and  $\chi^2 / df$  was 2.25, was less than 3.0 (Chau, 1997), suggesting the model fits the sample data well, other fit indices examined in this research included Goodness of Fit Index (GFI), Comparative Fit Index (CFI), and Incremental Fit Index (IFI) were 0.855, 0.912, 0.914 respectively, which was greater than 0.90 except GFI = 0.855 (Byrne, 1998). But Byrne (1998) points out that, the CFI and incremental-fit index (IFI) are more appropriate when the sample size is small. So, even other indices fit well with the CFI (0.912) and IFI (0.914) both exceeding the recommended 0.90 level suggesting a good model fit as recommended by Byrne (1998). Root Mean Square Residual (RMR) was 0.03; which was equal to 0.030 indicating a good fit (Bentler and Chou, 1987, Bollen, 1989).

As recommended by Byrne, 1998, when the sample size is small, CFI and IFI are recommended to be greater than 0.90; which was obtained, and IFI = 0.914. Thus, the researcher concludes that the model fits well.

## 5.6 Hypotheses Testing

The hypotheses presented were tested using structural equation modeling (SEM). SEM is an appropriate statistical technique when testing a model that is hypothesized a priori and which assesses the relationships among latent constructs that are measured by multiple scale items, where at least one construct is both a dependent and an independent variable (Hair et al., 1995). Additionally, it allows researchers to estimate the strength of relationships among scale items and latent constructs, while giving the investigator an indication of overall model fit.

To test the hypothesized relationship between Benchmarking, Standardization, Purchasing characteristic, purchasing performance and business performance, the researcher used the estimates of the path coefficients, i.e. Critical Ratio (C.R.) and Probability (P-value), as shown in table 5.12

**TABLE: 5.10**

**Summation of Hypotheses Results**

Hypotheses				Estimate Regressio n Weight	Standard Error	Critical Ratio	P- Value	Result
H1	Benchmarking		Purchasing Performance	0.367	0.084	4.388	***	Support at p<0.05
H2	Benchmarking	Mediated by PPF	Business Performance	0.228	0.008	5.339	***	Support at p<0.05
H3	Purchasing Performance		Business Performance	0.622	0.099	6.289	***	Support at p<0.05
H4	Standardization		Purchasing Performance	0.221	0.122	1.815	0.07	Support at p<0.07
H5	Standardization	Mediated by PPF	Business Performance	0.137	0.012	4.052	0.07	Support at p<0.07
H6	Purchasing Function Characteristic		Purchasing Performance	1.033	0.161	6.409	***	Support at p<0.05
H7	Purchasing Function Characteristic	Mediated by PPF	Business Performance	0.642	0.02	6.350	***	Support at p<0.05

The hypothesized model permits an examination of the direct effects of Benchmarking, Standardization, Purchasing Characteristic on purchasing performance and business performance, as well as the indirect effect of Benchmarking, Standardization, Purchasing Characteristic, as mediated by Purchasing performance on Business performance. Thus, the test of the proposed hypotheses is based on the direct and indirect effects in the structural model. All measures are presented in their standardized forms.

First, H1 (*Benchmarking has a positive impact on purchasing performance.*), the structural model expressed the relationship between *Benchmarking* (BMK) and *purchasing performance* (PPF) that the value of Critical Ratio (C.R) was at 4.388, the p-value is 0.000 (Support at p<0.05) . It implied that Benchmarking has positive impact on purchasing performance. This result suggests that purchasing managers who invest resources in establishing a formal procedure to benchmark the purchasing process and purchasing performance achieve higher levels of purchasing performance than firms with lower levels of investment.

Second, H<sub>2</sub> (*Benchmarking has a positive indirect impact (mediated by purchasing performance) on business performance*). The structural model expressed the relationship between *Benchmarking* (BMK) and indirect impact (mediated by purchasing performance) on business performance (BP) by path coefficient ( $P = 0.37 \times 0.62$ ) is 0.228 with Critical Ratio (C.R) was 5.339; p-value is 0.000 which supports at  $p < 0.05$  confidential levels. It implied that Benchmarking has positive indirect impact (mediated by purchasing performance) on business performance. In the long term, implementation of benchmarked practices should result in an improvement of the company's corporate performance. An additional explanation could be based on the fact that all areas of a company affect corporate performance, and the efforts of a single area could not be sufficient if the other areas of the company do not support it.

Third, H<sub>3</sub> (*Purchasing performance has a positive impact on the firm's business performance*). The structural model expressed the relationship between *Purchasing performance* (PPF) and *the firm's business performance* (BP); the value of Critical Ratio (C.R) was at 6.289, and the p-value is equal 0.000; which is less than the 0.05 confidential level. Hence H<sub>3</sub> was supported. This result implies that when purchasing performance levels increase, there is also improvement in business performance indicators of perceived production performance (product quality, delivery quality, delivery reliability and flexibility of production) and perceived financial performance (return on investment, return on sales, profit growth and return on total assets).

Fourth, H<sub>4</sub> (*Standardization in purchasing has a positive impact on purchasing performance*). The structural model expressed the relationship between *Standardization in purchasing* (SDD) and *purchasing performance* (PPF) with the value of Critical Ratio (C.R) at 1.815, and the p-value is equal 0.070; which equal to 0.07 confidential levels. It implied that Standardization in purchasing has a positive impact on purchasing performance, with 93% confident level. This is not highly

significant; the cause might be the lack of attention to the role of standardization in some Thailand's firms as mentioned in the literature review (Chapter2). Some firms who did not pay much attention on the standardization of the purchasing function might not enjoy the higher performance

Fifth, H<sub>5</sub> (*Standardization in purchasing has a positive indirect impact (mediated by purchasing performance) on business performance*). The structural model expressed the relationship between *Standardization in purchasing* (SDD) as a positive indirect impact (*mediated by purchasing performance*) on *business performance* (BP) with p-value higher than 0.070 confidential levels, path coefficient ( $\beta = 0.22 \times 0.62$ ) at 0.137, and Critical Ratio (C.R) was 4.052. It implied that Standardization has positive indirect impact (mediated by purchasing performance) on business performance at 93% confident level. This can be referred also to H<sub>4</sub> that some firms might not emphasize standardization in the purchasing function and thus would not enjoy the higher purchasing function effect on its business performance.

Sixth, H<sub>6</sub> (*Purchasing Function 's characteristics has a positive impact on purchasing performance*). The structural model expressed the relationship between *Purchasing Function 's characteristics* (PFC) and *purchasing performance* (PPF), with the value of Critical Ratio (C.R) at 6.409, and the p-value is equal to 0.000; which is less than 0.05 confidential levels. It implied that Purchasing Function's characteristics has a positive impact on purchasing performance. That mean the eyes of top management in Thailand are looking at the purchasing function as the major role to drive the overall firm's performance, as mentioned in Chapter 2.

Seventh, H<sub>7</sub> (*Purchasing Function's characteristics has a positive indirect impact (mediated by purchasing performance) on business performance*). The structural model expressed the relationship between *Purchasing Function 's characteristics* (PFC) as having a positive indirect impact (*mediated by purchasing performance*) on *business performance* (BP) with a path coefficient ( $\beta = 1.03 \times 0.62$ ) of 0.642, Critical Ratio

(C.R) at 6.350, and p-value at 0.000 which is less than 0.05 confidential levels. It implies that Purchasing Function's characteristics have a positive indirect impact (mediated by purchasing performance) on business performance.

This study is important because it is the first empirical research in the Thailand Food and Beverage industry to establish relationships between benchmarking, standardization, purchasing characteristic on purchasing performance and business performance using a structural equation model. Therefore, this research fills a gap between theory and practice in the purchasing area and its impact on purchasing and business performance.





## CHAPTER 6

### CONCLUSIONS AND RESEARCH IMPLICATIONS

In this chapter, the researcher concludes the results from the data analysis of the previous chapter. The chapter will include the conclusions, the research implications, research limitations, and direction for future research.

#### 6.1 Conclusions

We can now put forward an answer to the research question mentioned in Chapter I: *"How can firms enjoy higher purchasing and business performance by focusing on three main factors which include **benchmarking in the purchasing function**, **standardization in the purchasing function** and **purchasing function characteristics**?"* in the Thailand Food and Beverage industry.

To justify the small sample size results, we compare the results from this research with previous research. The results show the same effect for both Benchmarking and Purchasing Characteristic which affect the purchasing performance and it is mediated by purchasing performance to the business performance (significance at 0.05). However, standardization in the purchasing function has a significance level of only 0.070 which is not as strongly supportive as previous studies at a significance level of 0.05. The reason will be discussed later in this chapter.

First, we look at Benchmarking in the purchasing function. When the impact of benchmarking was examined on purchasing performance and business performance, the hypothesized relationships were supported. The study showed that benchmarking in the purchasing function has a significant positive impact on purchasing performance. The research also confirmed the notion that firms with high levels of purchasing performance also achieve high levels of business performance. Accordingly, the results of structural equation model testing indicated that there is a positive indirect effect of benchmarking on business performance. The implications for purchasing managers are

clear; implementation of benchmarking improves performance. More specifically, benchmarking the purchasing process and the purchasing performance assures high levels of quality of incoming materials, on-time delivery of purchase orders, achievement of inventory goals, timely response to internal customer inquiries, and overall internal customer satisfaction. These consequences will in turn improve business performance. The results of this research provide additional support for the relationships between benchmarking and performance as enunciated by Voss et al. (1997). Hence, purchasing managers may use benchmarking to improve purchasing performance in several ways. Benchmarking could be used in the following ways: as a tool to identify more advanced purchasing practices; to set challenging purchasing performance goals; and, to acquire a better understanding of the company's purchasing strengths and weaknesses relative to competitors, and implement improvement activities based on existing needs.

As a result of this study we have a better understanding of how standardization in purchasing, operationalized as standardization of materials and purchasing procedures, can impact a firm's purchasing and business performance. The results of this research indicate that standardization in purchasing has a significant positive effect on both purchasing and business performance, with a confidence level of 93 %. As discussed in the literature review, Chen et al (2004), standardization of materials/components and standardization of purchasing procedures have been considered both by practitioners and academics as improving purchasing and business performance. Purchasing can also have a significant impact on firm performance. The selected firms in this study were mostly dependent on their Head Office, and according to the interviews with some purchasing managers, they mainly follow the guidelines or procedures set by their Head Office without thinking about how it can help to improve their performance and overall performance. They pay attention only to how to follow the guidelines to meet the company policy rather than realizing the benefit of doing that. But in the future, or in further studies, the researcher should test other categories in the Thai FMCG industry or expand the sample size because of, as mentioned in the analysis part, the low response rate from the respondents in this research. It is obvious that standardizing materials and purchasing procedures is important and may help firms to meet their materials expenditure targets, and increase the quality of materials, on-time delivery from suppliers, and inventory performance. Potentially, the most important finding of

.....

this research is that standardization in purchasing has an indirect effect on business performance.

The confirmed positive effects of standardization in purchasing on purchasing and business performance in this study are encouraging for practitioners. The empirically validated positive relation of standardization in purchasing to firm's performance can be very useful for managers who take the initiative in standardization to promote and obtain the resources needed for the adoption of standardization of materials and purchasing procedures. Standardization in purchasing has much to offer firms that wish to improve their performance.

For purchasing characteristic, the study showed that, the purchasing function characteristic of purchasers in Thailand firm has a significant positive impact on purchasing performance and it implied that it has an indirect effect on business performance. In the analysis, the researcher dropped one item to get the model fit, which was the purchasing status. So, the strategic purchaser will have a positive effect on the overall firm's performance by participating in the strategic planning process itself. Developing and fostering cross-functional integration also play a key strategic role in the integration of the internal organization and the customer. Then the integration ability for the purchaser can help the firm's overall performance by proactively seeking efficient linkage or integration among its various internal functions, and with its suppliers and customers also, resulting in high supply chain problem solving ability, good information exchange and achieving high performance. For the purchaser skills, the role is to expand to incorporate activities such as supplier coordination, supplier development, and supplier market research, cost analysis, sourcing strategy formulation, benchmarking and outsourcing decisions.

## 6.2 Research Implications

The logical extension of these ideas into organizational design brings the following conclusion. It is dysfunctional to continue to think of purchasing as a service function which can be assigned to any senior manager who is willing to take the responsibility. In the past, operations have been basically split into internal and external segments. However, all functions now require both an internal and an external perspective; a

supply chain management perspective. The supply manager should be considered as a key manager of the supply chain. In this role, supply will need to continue to work closely with the organization's internal operations, as well as with customers and suppliers, to ensure that opportunities for gaining competitive advantage are fully explored. The supply manager will have to focus on building links to ensure that the organization's objectives are satisfactorily met.

The implications of this study are also important because the results suggest that firms can improve their purchasing performance through an increased emphasis in benchmarking the purchasing process and performance. And they should pay more attention to standardization to gain higher purchasing and business performance. Also, the researcher found that the Purchasing Characteristic has a positive effect on purchasing and business performance, so the findings are useful for practitioners seeking to improve the performance and standing of the purchasing function through identification of the characteristics and potential limitations faced at each phase.

Purchasing will have to become a regular player on the team, rather than a provider of 'support'. Key suppliers will also have to join the team. The growing reliance on suppliers to provide goods and services formerly sourced internally is placing new demands on effective supply management. The purchasing manager should become a manager of the supply chain, integrating the organization's internal and external operations, rather than keeping them separate.

Also from manager's perspective, there are benefits associated with elevating the purchasing function from non strategic to a strategic function. For Thailand Food and Beverage firms, these benefits include increased opportunities for the purchasing function to contribute to the long term profitability of the firm. Leading edge firms seek to have purchasing functions that are strategic. The firms would understand better the link between strategic purchasing and achieving the firm's goal and its performance. Similar to the strategic involvement of marketing and manufacturing in decision making, purchasing must be involved in strategic planning as well.



The model has not been tested or supported in the past specifically in Thailand. After testing the model, academics can find its reference is only for the Thailand Food and Beverage industry, not globally. The measures used in this research were adapted from previous studies, providing further evidence of measurement validity. The researcher was seeking to have a better understanding of the purchasing function in the Thailand context which the researcher believed would be different from other contexts or environments.

The researcher has tried to highlight the importance of the purchasing function in the organization. It should not be only a supporting function in the firm, instead it must be the core function, and to prove that the researcher has provided a tool to prove this and to improve the existing status. A lot of previous research has been done in the Europe and American environments, so this study might be the starting point for purchasing research to be done in the Thailand context.

### 6.3 Limitations and Directions for Future Research

The research limitations in this research were many. For example, the sample population could not cover all companies in the industry, because of time constraints and the limitations of availability of data. Firstly the researcher planned to distribute about 300 questionnaires to the respondents, but with limited time, only 260 were distributed. To get that number of questionnaires, the researcher had to use many ways to communicate with the respondents such as hand-carried, e-mail, mail and FAX.

The theory that has been used in this research had reference to the Europe and America contexts. So, there might be some variation in the Thailand context. That means that all theories may not be applicable. There was very rare research available that had been done about supply chains in the Thailand context. Also, the sample was drawn from a particular industry, so it could not be representative of all industries in Thailand. Furthermore, there may have been a lack of understanding and cooperation, and that might have caused difficulty in data collection.



Also there was a lack of commitment in the data collection, as the respondents were not familiar with research regarding purchasing topics, because there was a lack of research study available on the purchasing function in Thailand industry. So, most respondents did not realize the benefit of completing the questionnaire. With time limited, the researcher could only provide this research contribution with a limited number of respondents.

Future research could be extended to other industries in Thailand. The researcher may start with other respondents in the FMCG industry before moving on to test other industries. The framework may need to be changed or adapted to be suitable for other target industries. A purchasing study will lead researchers and managers to develop better ways towards purchasing improvement.



## References

Ac Nielsen (Thailand) Limited, What's Hot around the World, Reporting 2006.

Ahmad, A., Mehra, S. and Pletcher, M. (2004), "The perceived impact of JIT implementation on firms' financial/growth performance", *Journal of Manufacturing Technology Management*, Vol. 15 No. 2, pp. 118-30.

Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-23.

Anderson, M.G. and Katz, P.B. (1998), "Strategic sourcing", *International Journal of Logistics Management*, Vol. 9 No. 1, pp. 1-13.

Andersen, B., Fagerhaug, T., Randmaier, S., Schuldmaier, J. and Prenninger, J. (1999), "Benchmarking supply chain management: finding best practices", *Journal of Business and Industrial Marketing*, Vol. 14 No. 5/6, pp. 378-89.

Ammer, D. (1989), "Top management's view of the purchasing function", *Journal of Purchasing & Materials Management*, Winter, pp. 16-21.

Armstrong, J. Scotte and Terry Overton (1977), "Estimating Nonresponse Bias in Mail Surveys," *Journal of Marketing Research*, Vol. 15, No. 8, pp. 392-402.

Avery, S. (1998), "ComEd standardized safety supplies to cut MRO costs", *Purchasing*, July 16, pp. 203-4.

Avlonitis, G.J. and Gounaris, S.P. (1997), "Marketing orientation and company performance: industrial vs. consumer goods", *Industrial Marketing Management*, Vol. 26 No. 5, pp. 385-402.

Atuahene-Gima, K. (1995), "An exploratory analysis of the impact of market orientation on new product performance: a contingency approach", *The Journal of Product Innovation Management*, Vol. 12 No. 4, pp. 275-94.

Bagozzi, R.P. and Heatherton, T.F. (1994), "A general approach to representing multifaceted personality constructs: application to state self-esteem", *Structural Equation Modeling*, Vol. 1 No. 1, pp. 35-67.

Baker, K.R. (1985), "Safety stocks and commonality", *Journal of Operations Management*, Vol. 6 No. 1, pp. 12-22.

Baker, T.L., Simpson, P.M. and Siguaw, J.A. (1999), "The impact of suppliers' perceptions of reseller market orientation on key relationship constructs", *Journal of the Academy of Marketing Science*, Vol. 27 No. 1, pp. 50-7.

Beamon, B.M. (1999), "Measuring supply chain performance", *International Journal of Operations & Production Management*, Vol. 19 Nos 3-4, pp. 275-92.

Bales, W.A. and Fearon, H.E. (1993), CEO's/Presidents' Perceptions and Expectations of the Purchasing Function, Center for Advanced Purchasing Studies, Tempe, AZ.

Beamon, B.M. (1999), "Measuring supply chain performance", *International Journal of Operations & Production Management*, Vol. 19 Nos 3-4, pp. 275-92.

Beamon, B.M. and Chen, V.C.P. (2001), "Performance analysis of conjoined supply chains", *International Journal of Production Research*, Vol. 39 No. 14, pp. 3195-218.

Bendell, T., Boulter, L. and Kelly, J. (1993), *Benchmarking for Competitive Advantage*, Pitman Publishing, London.

Bennett, S.A. (1982), "Hey, Mr General Manager", *Management Quarterly*, Vol. 23 No. 4, pp. 41-2.

Bentler, P.M. and C.P. Chou (1987), "Practical issues in structural modeling", *Sociological Methods and Research*, Vol. 16 (1), pp. 78-117.

Berry, W.L., Tallon, W.J. and Boe, W.J. (1992), "Product structure analysis for the master scheduling of assemble to order products", *International Journal of Operations & Production Management*, Vol. 12 No. 11, pp. 24-41.

Bogan, C. and English, M.J. (1994), *Benchmarking for Best Practices: Winning through Innovative Adaptation*, McGraw-Hill, New York, NY.

Bollen, K.A. and Long, J.S. (Eds) (1993), *Testing Structural Equation Models*, Sage Publications, Thousand Oaks, CA.

Burt, D. and Doyle, M. (1994), *The American Keiretsu: A Strategic Weapon for Global Competitiveness*, Irwin, Burr Ridge, IL.

Byrne B.M., 1998, "Structural Equation Modeling with LISREL, PRELIS, SIMPLIS: Basic Concepts, Applications, and Programming", New Jersey: Lawrence Erlbaum Associates, Inc.

Cammish, R. and Keough, M. (1991), "A strategic role for purchasing", *The McKinsey Quarterly*, Vol. 3, pp. 22-39.

Camp, R.C. (1989), *Benchmarking: The Search for Industry Best Practices that Lead to Superior Performance*, ASQC Press, Milwaukee, WI.

Carr, A.S. and Pearson, J.N. (1999), "Strategically managed buyer-supplier relationships and performance outcomes", *Journal of Operations Management*, Vol. 17, pp. 497-519.

Carr, A.S. and Pearson, J.N. (2002), "The impact of purchasing and supplier involvement on strategic purchasing and its impact on firm's performance",

International Journal of Operations & Production Management, Vol. 22 No. 9, pp. 1032-53.

Carr, A.S. and Smeltzer, L. (1997), "An empirically based operational definition of strategic purchasing", *European Journal of Purchasing & Supply Management*, Vol. 3 No. 4, pp. 199-207.

Carter, J.R., Smeltzer, L. and Narasimhan, R. (1998), "The role of buyer and supplier relationships in integrating TQM through the supply chain", *European Journal of Purchasing & Supply Management*, Vol. 4, pp. 223-34.

Carr, A.S. and Smeltzer, L.R. (1999), "The relationship among purchasing benchmarking, strategic purchasing, firm performance, and firm size", *The Journal of Supply Chain Management*, Fall, pp. 51-60.

Carr, A.S. and Smeltzer, L.R. (2000), "An empirical study of the relationships among purchasing skills and strategic purchasing, financial performance, and supplier responsiveness", *Journal of Supply Chain Management*, Vol. 36 No. 3, pp. 40-54.

Can, A.S. and Pearson, J.N. (1999), "Strategically managed buyer-supplier relationships and performance outcomes", *Journal of Operations Management*, Vol. 17, pp. 497-519.

Can, A.S. and Pearson, J.N. (2002), "The impact of purchasing and supplier involvement on strategic purchasing and its impact on firm's performance", *International Journal of Operations & Production Management*, Vol. 22 No. 9, pp. 1032-53.

Cammish, R. and Keough, M. (1991), "A strategic role for purchasing", *The McKinsey Quarterly*, Vol. 3, pp. 22-39.

Camp, R.C. (1989), *Benchmarking: The Search for Industry Best Practices that Lead to Superior Performance*, ASQC Press, Milwaukee, WI, p12.

Cano, C.R., Carrillat, F.A. and Jaramillo, F. (2004), "A meta-analysis of the relationship between market orientation and business performance: evidence from five continents", *International Journal of Research in Marketing*, Vol. 21 No. 2, pp. 179-200.

Carter, C. and Ellram, L. (2003), "Thirty-five years of the Journal of Supply Chain Management: where have we been and where are we going?", *Journal of Supply Chain Management*, Vol. 39 No. 2, pp. 27-39.

Carter, J.R., Smeltzer, L. and Narasimhan, R. (1998), "The role of buyer and supplier relationships in integrating TQM through the supply chain", *European Journal of Purchasing & Supply Management*, Vol. 4, pp. 223-34.

Cavinato, J.L. (1999), "Fitting purchasing to the five stages of strategic management", *European Journal of Purchasing & Supply Management*, Vol. 5 No. 2, pp. 75-83.

Cavinato, J.L. and Kauffman, R.G. (1999), *The Purchasing Handbook: A Guide for Purchasing and Supply Professionals*, 6th ed., McGraw-Hill, New York, NY.

Chan, R.Y. and Chau, A. (1998), "Do marketing-oriented children and youth centres (CYCs) perform better: an exploratory study in Hong Kong", *Journal of Professional Services Marketing*, Vol. 16 No. 1, pp. 15-28.

Chao, C., Scheuing, E. and Ruch, W. (1993), "Purchasing performance evaluation: an investigation of different perspectives", *International Journal of Purchasing and Materials Management*, Vol. 29 No. 3, pp. 33-9.

Chao, C., Scheuing, E. and Ruch, W. (1993), "Purchasing performance evaluation: an investigation of different perspectives", *International Journal of Purchasing and Materials Management*, Vol. 29 No. 3, pp. 33-9.

Chau, P. (1997), "Re-examining a model for evaluating information center success using a structural equation modeling approach", *Decision Sciences*, Vol. 28 No. 2, pp. 309-34.

Chen, I.J., Paulraj, A. and Lado, A.A. (2004), "Strategic purchasing, supply management, and firm performance", *Journal of Operations Management*, Vol. 22 No. 5, pp. 505-23.

Churchill, G. (1979), "A paradigm for developing better measures of marketing constructs", *Journal of Marketing Research*, Vol. 16 No. 1, pp. 64-73.

Collier, D.A. (1981), "The measurement and operating benefits of component part commonality", *Decision Sciences*, Vol. 12 No. 1, pp. 85-96.

Collier, D.A. (1982), "Aggregate safety stock levels and component part commonality", *Management Science*, Vol. 28 No. 11, pp. 1296-303.

Cooper, M. and Ellram, L. (1993), "Characteristics of supply chain management and the implications for purchasing and logistics strategy", *International Journal of Logistics Management*, Vol. 4 No. 2, pp. 13-24.

Cooper, R.G. (1995), "Developing new products on time, in time", *Research Technology Management*, Vol. 38 No. 5, p. 49.

Cousins, P.D. and Spekman, R. (2003), "Strategic supply and the management of inter- and intra-organisational relationships", *Journal of Purchasing & Supply Management*, Vol. 9, pp. 19-29.

Cousins, P.D. (2005), "The alignment of appropriate firm and supply strategies for competitive advantage", *International Journal of Operations & Production Management*, Vol. 25 No. 5, pp. 403-28.



Cristobal S R; Angel R. Martinez-Lorente; Jose G. Clavel ;( 2003), "Benchmarking in the purchasing function and its impact on purchasing and business performance", International Journal of Purchasing and Business performance, Vol. 10 No. 5, 2003 pp. 457-471.

Cristobal S R; Angel R. Martinez-Lorente; Jose G. Clavel ;( 2006), "An empirical study on the impact of standardization of materials and purchasing procedures on purchasing and business performance, International Journal of Supply Chain Management, Vol. 11 No. 1, 2006, pp61-62"

Dixon, J.R., Nanni, A.J. and Vollmann, T.E. (1990), The New Performance Challenge: Measuring Operations for World-class Competition, Dow Jones-Irwin, Homewood, IL

Dobler, D.W. and Burt, D.N. (1996), Purchasing and Supply Management: Text and Cases, McGraw-Hill, New York, NY.

Dowlatsahi, S. (1992), "Purchasing's role in a concurrent engineering environment", International Journal of Purchasing and Materials Management, Vol. 28 No. 1, pp. 21 5.

Drongelen, I.C.K-V. and Fisscher, O.A.M. (2003), "Ethical dilemmas in performance measurement", Journal of Business Ethics, Vol. 45 Nos 1/2, pp. 51-63.

DSouza, D.E. and Williams, F.P. (2000), "Appropriateness of the stakeholder approach to measuring manufacturing performance", Journal of Managerial Issues, Vol. 12 No. 2, pp. 227-46.

Ellram, L.M. and Pearson, J.N. (1993), "The role of the purchasing function: toward team participation", International Journal of Purchasing and Materials Management, Vol. 29 No. 3, pp. 3-10.

Ellram, L. and Billington, C. (2001), "Purchasing leverage considerations in the outsourcing decision", European Journal of Purchasing & Supply Management, Vol. 7 No. 1, pp. 15-27.

Ellram, L.M. and Carr, A. (1994), "Strategic purchasing: a history and review of the literature", International Journal of Purchasing & Materials Management, Vol. 30 No. 2, pp. 10-22.

Eynan, A. and Rosenblatt, M.J. (1996), "Component commonality: effects on inventory costs", IIE Transactions, Vol. 28 No. 2, pp. 93-104.

Faes, W., Knight, L. and Matthyssens, P. (2001), "Buyer profiles: an empirical investigation of changing organizational requirements", European Journal of Purchasing & Supply Management, Vol. 7 No. 3, pp. 197-208.

Farmer, D. (1972), "The impact of supply markets on corporate planning", Long Range Planning, Vol. 5 No. 1, pp. 10-15.

- Frohlich, M.T. and Westbrook, R. (2001), "Arcs of integration: an international study of supply chain strategies", *Journal of Operations Management*, Vol. 19, pp. 185-200.
- Forker, L.B. and Mendez, D. (2001), "An analytical method for benchmarking best peer suppliers", *International Journal of Operations & Production Management*, Vol. 21 No. 1/2, pp. 195-209.
- Fornell C. and Larcker D.F. (1981), "Evaluating Structural Equation Models with Unobserved Variables and Measurement Error," *Journal of Marketing Research*, Vol. 25, No. 2.
- Freeman, V.T. and Cavinato, J.L. (1990), "Fitting purchasing to the strategic firm: frameworks, processes, and values", *Journal of Purchasing & Materials Management*, Winter, pp. 6-10.
- Frohlich, M.T. and Westbrook, R. (2001), "Arcs of integration: an international study of supply chain strategies", *Journal of Operations Management*, Vol. 19, pp. 185-200.
- Gerchak, Y., Magazine, M.J. and Gamble, A.B. (1988), "Component commonality with service level requirements", *Management Science*, Vol. 34 No. 6, pp. 753-60.
- Gilmour, P. (1999), "Benchmarking supply chain operations", *International Journal of Physical Distribution & Logistics Management*, Vol. 5 No. 4, pp. 259-66.
- Giunipero, L. and Percy, D. (2000), "World-class purchasing skills: an empirical investigation", *Journal of Supply Chain Management*, Vol. 34 No. 4, pp. 4-19.
- Giunipero, L.C., Denslow, D. and Eltantawy, R. (2005), "Purchasing/supply chain management flexibility: moving to an entrepreneurial skill set", *Industrial Marketing Management*, Vol. 34 No. 6, pp. 602-3.
- Globerson, S. (1985), "Issues in developing a performance criteria system for an organization", *International Journal of Production Research*, Vol. 23 No. 4, pp. 639-46.
- Greenley, G.E. (1995), "Market orientation and company performance: empirical evidence from UK companies", *British Journal of Management*, Vol. 6 No. 1, pp. 1-13.
- Guerrero, H.H. (1985), "The effect of various production strategies on product structures with commonality", *Journal of Operations Management*, Vol. 5 No. 4, pp. 395-410.
- Gunasekaran, A., Patel, C. and McGaughey, R.E. (2004), "A framework for supply chain performance measurement", *International Journal of Production Economics*, Vol. 87 No. 3, pp. 333-47.

- Gunasekaran, A., Patel, C. and Tirtiroglu, E. (2001), "Performance measures and metrics in a supply chain environment", *International Journal of Operations & Production Management*, Vol. 21 Nos 1-2, pp. 71-87.
- Hair, J., Anderson, R., Tatham, R. and Black, W. (1995), *Multivariate Data Analysis with Readings*, Prentice Hall International Editions, New York, NY.
- Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998), *Multivariate Data Analysis*, Prentice-Hall, Englewood Cliffs, NJ.
- Han, J.K., Kim, N. and Srivastava, R.K. (1998), "Market orientation and organizational performance: is innovation a missing link?", *Journal of Marketing*, Vol. 62 No. 4, pp. 30-45.
- Handfield, R.B. (1993), "The role of materials management in developing time-based competition", *International Journal of Purchasing and Materials Management*, Vol. 29 No. 1, pp. 2-9.
- Hillier, M.S. (1999), "Component commonality in a simple inventory model with service levels constraints", *International Journal of Production Research*, Vol. 37 No. 12, pp. 2665-83.
- Hillier, M.S. (2002), "Using commonality as a backup safety stock", *European Journal of Operational Research*, Vol. 136 No. 2, pp. 353-65.
- Hogan, J.E. And Armstrong, G. (2001), "Toward a resource-based theory of business exchange relationships; the role of relational asset value", *Journal of Business to Business Marketing*, Vol. 8 No. 4, pp. 3-28.
- Household Socio-economic Survey, National Statistical office Thailand, available from: [HTTP://WWW.NGO.OR.TH](http://WWW.NGO.OR.TH) [Accessed January 2007]
- Imai, M. (1997), *Gemba Kaizen: A Commonsense Low-cost Approach to Management*, McGraw-Hill, New York, NY.
- Jaworski, B.J. and Kohli, A.K. (1993), "Market orientation: antecedents and consequences", *Journal of Marketing*, Vol. 57 No. 3, pp. 53-70.
- Jayaram, J. and Vickery, S.K. (1998), "Supply-based strategies, human resource initiatives, procurement lead time, and firm performance", *International Journal of Purchasing and Materials Management*, Vol. 34 No. 1, pp. 12-23.
- Jayaram, J., Vickery, S.K. and Droge, C. (2000), "The effects of information systems infrastructure and process improvements on supply-chain time performance", *International Journal of Physical Distribution & Logistics Management*, Vol. 30 Nos 3/4, pp. 314-30.
- Joreskog, K.G. and Sorbom, D. (1993), *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*, Scientific International Software, Chicago, IL.

Kaplan, R.S. and Norton, D.P. (1992), "The balanced scorecard: measures that drive performance", *Harvard Business Review*, Vol. 70 No. 1, pp. 71-9.

Keegan, D.P., Eiler, R.G. and Jones, C.R. (1989), "Are your performance measures obsolete?", *Management Accounting*, June, pp. 134-47.

Klassen, R.D. and Whybark, D.C. (1999), "The impact of environmental technologies on manufacturing performance", *Academy of Management Journal*, Vol. 42 No. 6, pp. 599-615.

Kim, W.C. and Hwang, P. (1992), "Global strategy and multinationals' entry mode choice", *Journal of International Business Studies*, Vol. 23 No. 1, pp. 29-53.

Kline, R.B. (1998), *Principles and Practice of Structural Equation Modeling*, The Guilford Press, New York, NY.

Knudsen, D. (1999), "Procurement performance measurement system", licentiate dissertation, Department of Design Sciences, Lund University, Lund.

Kohli, A.K. and Jaworski, B.J. (1990), "Market orientation: the construct, research propositions, and managerial implications", *Journal of Marketing*, Vol. 54 No. 2, pp. 1-18.

Korpela, J. and Tuominen, M. (1996), "Benchmarking logistics performance with an application of the analytic hierarchy process", *IEEE Transactions on Engineering Management*, Vol. 43 No. 3, pp. 323-33.

Kotter, J.P. (1978), *Organizational Dynamics*, Addison-Wesley, Reading, MA.

Kraljic, P. (1983), "Purchasing must become supply management", *Harvard Business Review*, pp. 110-7.

Lambert, Douglas and Thomas Harrington (1990), "Measuring Nonresponse Bias in Mail Surveys," *Journal of Business Logistics*, Vol. 11, No. 2, pp. 5-25.

Lamming, R.C. (1993), *Beyond Partnership: Strategies for Innovation and Lean Supply*, 1st ed., Prentice-Hall, London.

Landeghem, R.V. and Persoons, K. (2001), "Benchmarking of logistical operations based on a causal model", *International Journal of Operations & Production Management*, Vol. 21 No. 1/2, pp. 254-66.

Lee, T. and Tsai, J. (2005), "The effects of business operation mode on market orientation, learning orientation and innovativeness", *Industrial Management & Data Systems*, Vol. 105 No. 3, pp. 325-48.

Leenders, M.R., Fearon, H.E., Flynn, A.E. and Johnson, P.F. (2002), *Purchasing and Supply Management*, McGraw-Hill Irwin, Chicago, IL.

Malhotra, N.K., J., Shaw, M., and Crisp, M. (1996), "Marketing Research: An Applied Orientation", Sydney, Prentice hall, pp.305.



McNair, C.J. and Leibfried, K.H.J. (1992), *A Benchmarking Tool for Continuous Improvement*, HarperCollins Publishers, New York, NY.

Monczka, R. and Morgan, J. (1993), "Benchmarking: what you need to make it work", *Purchasing*, Vol. 11 No. 4, p. 63-66, 69.

Monczka, R.M., Trent, R.J. and Handfield, R.B. (2002), *Purchasing and Supply Chain Management*, South-Western, Cincinnati, OH.

Nagarur, N. and Azeem, A. (1999), "Impact of commonality and flexibility on manufacturing performance: a simulation study", *International Journal of Production Economics*, Vol. 60-61, pp. 125-34.

Narasimhan, R. and Das, A. (2001), "The impact of purchasing integration and practices on manufacturing performance", *Journal of Operations Management*, Vol. 19 No. 5, pp. 593-609.

Narasimhan, R. and Kim, S.W. (2002), "Effect of supply chain integration on the relationship between diversification and performance: evidence from Japanese and Korean firms", *Journal of Operations Management*, Vol. 20, pp. 303-23.

Neely, A., Gregory, M. and Platts, K. (1995), "Performance measurement systems design: a literature review and research agenda", *International Journal of Operations & Production Management*, Vol. 15 No. 4, pp. 80-116.

Neely, A. (1999), "The performance measurement revolution: why now and what next?", *International Journal of Operations & Production Management*, Vol. 19 No. 2, pp. 205-28.

Novack, R.A. and Simco, S.W. (1991), "The industrial procurement process: a supply chain perspective", *Journal of Business Logistics*, Vol. 12 No. 1, pp. 145-67.

Nunnally J. C. and Bernstein I.H. (1994), *Psychometric Theory*, McGraw-Hill, Inc., NY.

Pagell, M. (2004), "Understanding the factors that enable and inhibit the integration of operations, purchasing and logistics", *Journal of Operations Management*, Vol. 22 No. 5, pp. 459-87.

Parvoty, F.Y. (1994), "Determining what to benchmark: an analytic hierarchy process approach", *International Journal of Operations & Production Management*, Vol. 14 No. 6, pp. 25-39.

Pelham, A.M. (1999), "Influence of environment, strategy, and market orientation on performance in small manufacturing firms", *Journal of Business Research*, Vol. 45 No. 1, pp. 33-46.



Pelham, A.M. and Wilson, D.T. (1996), "A longitudinal study of the impact of market structure, firm structure, strategy, and market orientation culture on dimensions of small-firm performance", *Journal of the Academy of Marketing Science*, Vol. 24 No. 1, pp. 27-44.

Perera, H.S.C., Nagarur, N. and Tabucanon, M.T. (1999), "Component part standardization: a way to reduce the lifecycle costs of products", *International Journal of Production Economics*, Vol. 60-61, pp. 109-16.

Porter, A.M. (2002), "Gillette's chief executive puts power into purchasing", *Purchasing*, July 18, pp. 28-30.

Purchasing (1994a), "How the best in the world buy", *Purchasing*, Vol. 116 No. 5, pp. 25-7.

Purchasing (1994b), "Benchmarking turns a corner", *Purchasing*, Vol. 117 No. 7, pp. 74-6.

Purchasing (2002), "Purchasing survey. Buyer's cost reduction goals average 12 percent in '02, October", *October 10*, p. 17.

Raju, P.S., Lonial, S.C. and Gupta, Y.P. (1995), "Market orientation and performance in the hospital industry", *Marketing Health Services*, Vol. 15 No. 4, p. 34.

Rapert, M.I., Babakus, E. and Olson, J. (1997), "Transcending functional boundaries: the cultural, strategic, and tactical domains of marketing", *Health Marketing Quarterly*, Vol. 15 No. 2, pp. 33-47.

Reck, R.F. and Long, B.G. (1988), "Purchasing: a competitive weapon", *Journal of Purchasing & Materials Management*, Fall, pp. 2-8.

Rosenzweig, E.D., Roth, A.V. and Dean, J.W. Jr (2003), "The influence of an integration strategy on competitive capabilities and business performance: an exploratory study of consumer products manufacturers", *Journal of Operations Management*, Vol. 21, pp. 437-56.

Sackman, S.A. (1992), "Culture and subcultures: an analysis of organizational knowledge", *Administrative Science Quarterly*, Vol. 37 No. 1, pp. 140-61.

Sekaran U., 1992, "Research Methods for Business: a Skill Building Approach", 2<sup>nd</sup> Ed., New York: John Wiley and Sons, Inc.

Segars, A. and Grover, V. (1993), "Re-examining perceived ease of use and usefulness: A confirmatory factor analysis", *MIS Quarterly*, Vol. 17 No. 4, pp. 517-25.

Slater, S.F. and Narver, J.C. (1995), "Market orientation and the learning organization", *Journal of Marketing*, Vol. 59 No. 3, pp. 63-84.

Spekman, R., Kamuff, J. and Spear, J. (1999), "Towards more effective sourcing and supplier management", *European Journal of Purchasing and Supply Management*, Vol. 5 No. 2, pp. 103-16.

Spendolini, M.J. (1992), "The benchmarking process", *Compensation and Benefits Review*, September/October, pp. 21-9.

Stanley, L. and Wisner, J. (2001), "Service quality along the supply chain: implications for purchasing", *Journal of Operations Management*, Vol. 19 No. 3, pp. 287-306.

Stork, K. (1996), "Benchmarking: what's in it for me", *Purchasing*, June 20.

Van Weele, A.J. (2000), *Purchasing and Supply Chain Management*, Thomson Learning, Boston, MA.

Varadarajan, P.R. and Jayachandran, S. (1999), "Marketing strategy: an assessment of the state of the field and outlook", *Journal of the Academy of Marketing Science*, Vol. 27 No. 2, pp. 120-43.

Vakharia, A.J., Parmenter, D.A. and Sanchez, S.M. (1996), "The operating impact of parts commonality", *Journal of Operations Management*, Vol. 14 No. 1, pp. 3-18.

Voss, C.A., Ahlstrom, P. and Blackmon, K. (1997), "Benchmarking and operational performance: some empirical results", *International Journal of Operations & Production Management*, Vol. 17 No. 10, pp. 1046-58.

Wacker, J.G. and Treleven, M. (1986), "Component part standardization: an analysis of commonality sources and indices", *Journal of Operations Management*, Vol. 6 No. 2, pp. 219-44.

Wrenn, B., LaTour, S.A. and Calder, B.J. (1994), "Differences in perceptions of hospital marketing orientation between administrators and marketing officers", *Hospital and Health Services Administration*, Vol. 39 No. 3, p. 341.

Yasin, M.M. (2002), "The theory and practice of benchmarking: then and now", *Benchmarking: An International Journal*, Vol. 9 No. 3, pp. 217-43.

Zikmund W.G. (1999), *Essentials of Marketing Research*, Philadelphia: The Dryden Press.



## Appendix A: Survey Instrument

---

*Benchmarking, Standardization and Purchasing Characteristic and its impact on purchasing and business performance in Thai FMCG industry (Food and Beverage)*

---

*Dear Supervisors /Managers,*

This questionnaire is a part of a research study currently being carried out by a Masters (M.sc. SCM) candidate in the faculty of Supply Chain Management (SCM) from the Graduate School of Management at Assumption University (AU). This research attempts to understand the relationship between Benchmarking, Standardization and Purchasing function characteristic leads to the greater level of Purchasing and Business Performance.

You are one of a number of supply chain members (Customer, Manufacturer, or Supplier) firms that have been selected to participate. Your participation will provide valuable information concerning: (1) General information about your firm, (2) The factors that are related to your purchasing specific factors and firm's performance.

In addition, please be assured that **all responses will be held strictly confidential and no information which could reveal your firm's or your own identity will be used in any data reporting, nor will it be shared in its individual form with any outside party without your expressed permission to do so.** The questionnaire takes approximately 15-20 minutes to complete.

Your participation and valuable contribution to this research is greatly appreciated. Please answer all the questions fully and sent it back via either by email or by hand when it's completed

Should you have any concerns or questions related to this survey, please do not hesitate to contact Akapol Sawasdiraksa at 6687-821-5519 or email: [Akapolscm@gmail.com](mailto:Akapolscm@gmail.com), M.sc.SCM Candidate, The Graduate School of Management, Assumption University.

Thank you for your valuable contribution to this research.

Sincerely,

Sincerely,

*Asst. Professor Dr. Mohammad Asif Salam*

*Akapol Sawasdiraksa*

Program Director, SCM

M.sc. SCM Candidate

School of Management, AU

School of Management, AU

## Questionnaire

M.sc. SCM Research Paper (Graduate Project) on Benchmarking, Standardization and Purchasing Characteristic and its impact on purchasing and business performance in Thai FMCG industry (Food and Beverage)



*\*\*\*Thank you for taking time to complete this questionnaire. We assure you of complete confidentiality on all of your responses.\*\*\**

### **M.sc. SCM Research Paper (Graduate Project)**

Thank you for taking the time to participate in the study. This questionnaire should take about 15-20 minutes to complete. *All responses are strictly confidential and no information which could reveal your firm's or your own **identity** will be used in any data reporting, nor will it be shared in its individual form with any outside party without your expressed permission to do so.*

# PART I

## GENERAL INSTRUCTIONS

This survey is intended to capture the factors in purchasing function and prove that it will lead to the higher purchasing and business performance. You will be asked to evaluate each measure for its usefulness in providing certain types of information. While answering these questions please consider the measure's ability to provide the listed type of information.

The way a measure is presently being used in the purchasing function of your company and comparing with your competitors. We are interested in the measure's inherent usefulness, not its current success within your company. Please base your responses on your overall familiarity with the measure itself, not the current success or failure of the measure to perform within your current company. We are trying to understand how the measure should be used, rather than how you might be presently using them. The next section describes the all five criteria you will be asked to rate for each measure.

### DEFINITION OF TERMS:

The definitions of the terms that will be used in this questionnaire are summarized below for your guidance and usefulness.

**Benchmarking** – the formal process of gathering and analyzing information about the purchasing process and purchasing performance of other organizations (competitors and/or non-competitors) in order to improve the company's own purchasing process and performance. Yasin (2002)

**Standardization** - defined as the standardization of purchased materials (i.e. replacement of several materials and components by a single component that has all the functionalities of the materials/components it replaces), and the standardization of purchasing procedures (e.g. standard procedures for ordering, expediting, receipt and inspection of goods, and selection and evaluation of suppliers). Jayaram and Vickery's (1998)

**Purchasing Function Characteristic**:- defined into four variables that we expected would influence different purchasing and business performance. These variables capture information on the role of purchasing in strategic planning, its status in the eyes of top managers, the level of internal integration and skill development. (Carr and Smeltzer, 1997; Rosenzweig et al., 2003)

**Purchasing Performance** —included quality of materials purchased, on-time delivery, actual versus target materials' cost and overall internal customer satisfaction. Chao's et al. (1993)

**Business Performance** – Two dimensional has been measured. Production performance assessed the firm's performance on dimensions of product quality, delivery speed, delivery reliability and flexibility of production, using scales adapted from Carr and Smeltzer (2000). Financial performance was assessed on the basis of return on investment, return on sales, profit growth, and return on total assets (Can and Pearson, 2002; Can and Smeltzer, 2000).



## PART 2

### BENCHMARKING IN PURCHASING FUNCTION

Please indicate the extent to which the following statements represent the benchmarking of your purchasing function with external including competitors and others company with the same industry.

Benchmarking	Strongly Disagree	Disagree	Average	Agree	Strongly Agree
	1	2	3		5

BMK: Benchmarking	1	2	3	4	5
BMK1: We gathers information about prices and level of quality of purchases of other companies in our industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BMK2: We analyze the purchasing process of other companies to improve our own purchasing process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BMK3: There is a formal procedure to compare our performance with the purchasing performance of other companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### STANDARDIZATION IN PURCHASING FUNCTION

The lists of question below are indicating the level of usage for your standardization in your purchasing function both material and procedure. Please indicate the usage of your standardization in your purchasing function.

Standardization	Extremely Low	Moderately Low	Average	Moderately High	Extremely High
		2	3	4	5

SDD: Standardization in Purchasing Function	1	2	3	4	5
SDD1: We make intensive use of standardization of raw materials and parts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SDD2: We make intensive use of standardization purchasing procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## PURCHASING FUNCTION CHARACTERISTIC

Purchasing function characteristic	Strongly Disagree	Disagree	Average	Agree	Strongly Agree
------------------------------------	-------------------	----------	---------	-------	----------------

1
2
3
4
5

Do you agree with the following statements about purchasing level of involvement in strategic planning within your firm?

<b>STP: Strategic Planning</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
STP1: Purchasing is included in the firm's long strategic planning process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STP2: Purchasing performance is measured in terms of its contributions to firm's success	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STP3: Purchasing professionals' development focuses on the elements of the competitive strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STP4: Purchasing focus is on longer term issues that involve risk and uncertainty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STP5: The purchasing function has a formally written long range plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you agree with the following statements about the status of the purchasing function within your organization?

<b>PCS: Purchasing Status</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
PCS1: Top management is supportive of our efforts to improve the purchasing department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCS2: In this company, purchasing is considered a vital part of our company strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCS3: Purchasing's views are considered important in most top managers' eyes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To what extent do the following statements reflect the level of integration of the purchasing function within your firm?

<b>ITI: Internal Integration</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
ITI1: Purchasing regularly attends strategy meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ITI2: Purchasing recommends and initiates changes in end products and inputs, based on supply market analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ITI3: A high proportion of purchasing personnel spend time in market and price/cost analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ITI4: Purchasing participates in new product design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ITI5: Purchasing participates in process design and improvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1T16: Purchasing is measured on strategic contributions to the company (e.g. new products/technologies), versus cost and efficiency contributions				o	o

How much do you agree with the following statements about the level of purchasing personnel's knowledge and skills within your firm?

PCS: Purchasing Skills	1	2	3	4	5
PCS1: Purchasing professionals have the necessary skills to monitor and interpret changes in the supplier market/product base	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCS2: Purchasing professionals have the technical capabilities to help our suppliers improve their processes and products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCS3: Purchasing professionals have the necessary skills to improve the firm's total cost of doing business with the firm's suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCS4: Purchasing professionals demonstrate perseverance, imagination, decisiveness and interpersonal skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## PURCHASING PERFORMANCE

Please indicate the extent to which the following statements represent purchasing performance of your purchasing function.

Purchasing Performance	Strongly Disagree	Disagree	Average	Agree	Strongly Agree
	1	2	3	—	5

PPF: Purchasing Performance	1	2	3	4	5
PPF1: Most of raw materials and parts received are in conformance with specifications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PPF2: All raw materials and parts arrive within the delivery date	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PPF3: the quantity of materials purchased in inventory meets the company's quantity performance goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PPF4: Purchasing meets its materials' target cost (standard cost or budgeted cost).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PPF5: Customer departments are satisfied with the level of attention and commitment shown by purchasing when there is a problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# BUSINESS PERFORMANCE

How would you rate your perceived company's performance in comparison with your direct competitors with respect to the following business performance indicators (5 represents "well above our competitors," and 1 represents "well below our competitors").

Business Performance	Well below our competitors	Below our competitors	equally	Above our competitors	Well above our competitors
	1	2	3	4	

PRO: Perceived - Production Performance	1	2	3	4	5
PRO1: Product quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PRO2: Delivery speed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PRO3: Delivery reliability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PRO4: Flexibility of production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FIN: Perceived - Financial Performance	1	2	3	4	5
FIN1: Return on investment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FIN2: Return on sales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FIN3: Profit growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FIN4: Return on total assets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## *Appendix B.*

### *Variables used to assess the constructs*

<i>Construct/item</i>
<b><i>BMK: Benchmarking</i></b>
BMK1: We gathers information about prices and level of quality of purchases of other companies in our industry
BMK2: We analyze the purchasing process of other companies to improve our own purchasing process
BMK3: There is a formal procedure to compare our performance with the purchasing performance of other companies
<b><i>SDD: Standardization in Purchasing Function</i></b>
SDD1: We make intensive use of standardization of raw materials and parts.
SDD2: We make intensive use of standardization purchasing procedures.
<b><i>STP: Strategic Planning</i></b>
STP1: Purchasing is included in the firm's long strategic planning process
STP2: Purchasing performance is measured in terms of its contributions to firm's success
STP3: Purchasing professionals' development focuses on the elements of the competitive strategy
STP4: Purchasing focus is on longer term issues that involve risk and uncertainty
STP5: The purchasing function has a formally written long range plan
<b><i>PCS: Purchasing Status</i></b>
PS1: Top management is supportive of our efforts to improve the purchasing department
PS2: In this company, purchasing is considered a vital part of our company strategy
PS3: Purchasing views are considered important in most top managers' eyes
<b><i>ITI: Internal Integration</i></b>
ITI1: Purchasing regularly attends strategy meetings
ITI2: Purchasing recommends and initiates changes in end products and inputs, based on supply market analysis
ITI3: A high proportion of purchasing personnel spend time in market and price/cost analysis
ITI4: Purchasing participates in new product design
ITI5: Purchasing participates in process design and improvement
ITI6: Purchasing is measured on strategic contributions to the company (e.g. new products/technologies), versus cost and efficiency contributions
<b><i>PCS: Purchasing Skills</i></b>
PCS1: Purchasing professionals have the necessary skills to monitor and interpret changes in the supplier market/product base
PCS2: Purchasing professionals have the technical capabilities to help our suppliers improve their processes and products
PCS3: Purchasing professionals have the necessary skills to improve the firm's total cost of doing business with the firm's suppliers
PCS4: Purchasing professionals demonstrate perseverance, imagination, decisiveness and interpersonal skills
<b><i>PPF: Purchasing Performance</i></b>
PPF1: Most of raw materials and parts received are in conformance with specifications
PPF2: All raw materials and parts arrive within the delivery date
PPF3: the quantity of materials purchased in inventory meets the company's quantity performance goals
PPF4: Purchasing meets its materials' target cost (standard cost or budgeted cost).
PPF5: Customer departments are satisfied with the level of attention and commitment shown by purchasing when there is a problem



<i>Business performance</i>
<i>PRO: Perceived - Production Performance</i>
PRO1: Product quality
PRO2: Delivery speed
PRO3: Delivery reliability
PRO4: Flexibility of production
<i>FIN: Perceived - Financial Performance</i>
FIN1: Return on investment
FIN2: Return on sales
FIN3: Profit growth
FIN4: Return on total assets



*Appendix C.*  
*Surveyed Company's Lists*

1. Nestle (Thai) Ltd.
2. Quality Coffee Products Ltd
3. Useful Food Co., Ltd.
4. Uniliver Thai Trading, Ltd.
5. Berli Jucker Public Co., Ltd.
6. United Dairy Food Co., Ltd.
7. Perrier Vittel (Thailand) Ltd.
8. Thai-MC Co., Ltd.
9. Phuket Square Co., Ltd.
10. CP Intertrade & Marketing Ltd.
11. Thai Preserved Food Factory Co., Ltd.
12. CP Seven Eleven Public Co., Ltd.
13. Friesland Foods (Foremost) Co., Ltd.
14. AB Food and Berverage (TH) Ltd
15. Khonkan Bervery Ltd (Beer Leo).
16. Nuthrix Co., Ltd.
17. Dairy Plus (Dutchmill) Ltd.
18. Thai Gulico Ltd.
19. Malee Fruit Ltd.
20. Surapon Food Co., Ltd.
21. Monde Nissin Ltd.