THE ADOPTION OF JUST-IN-TIME PURCHASING PRACTISES
AND ITS IMPACT ON FIRM PERFORMANCE IN A
DEVELOPING COUNTRY:
THE CASE OF VIETNAM

By

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A handwritten signature in black ink, appearing to read "Anand Kumar", written over a horizontal line.

Director, Sprott School of Business

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ABSTRACT

This paper attempts to comprise an integrated list of JIT purchasing practices. JIT purchasing practices are divided into three groups: operational, supplier-buyer relationship development, and organizational. Next, it examines the impact of these practices on firm performance, which is defined in four dimensions: quality, cost, productivity and lead-time. It is predicted that plants having a JIT purchasing program perform better than those without it. This study also explores the influence of firm size and ownership type on the implementation level of JIT purchasing, as well as on the relationship between JIT purchasing and firm performance. Firm size and ownership type have the potential to affect a plant in terms of resources available and the regulations it is subjected to, especially in the case of Vietnam.

54 companies located in Vietnam are interviewed. The research findings indicate that firm size and ownership type indeed affect the extent of implementation of JIT purchasing practices for firms in Vietnam. However, it appears that JIT purchasing does not have a significant impact on all dimensions of firm performance. In fact, the research results indicate that JIT purchasing only has positive influence on product quality in the case of companies located in Vietnam. Furthermore, it is concluded that firm size and ownership type are unlikely to have a significant impact on the effect of JIT purchasing on firm performance.

This study points out to managers of plants located in Vietnam that currently, JIT purchasing has not been implemented to a high extent in Vietnam. It also shows that the

impact of JIT purchasing on firm performance may not necessarily be as significant as it was thought. However, it shows that JIT purchasing still has a positive effect on firm performance, particularly product quality, of manufacturing companies located in Vietnam. The qualitative analysis also reveals that industry sector plays a significant role in explaining the results of the study. Thus, companies, when implementing JIT purchasing in the Vietnamese environment, should proceed with caution based on their industry characteristics. This study also helps to expose Vietnamese companies to academic research, which is still very rare at the moment.

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CHAPTER 1

INTRODUCTION

It is widely believed that Just-In-Time (JIT) manufacturing contributed significantly to the success of Japanese firms in the last three decades. Perhaps, this is the reason why Just-In-Time has also become one of the most popular topics in management research literature (Schonberger 1982, Waters 1984, Freeland 1986). Furthermore, it has been recognized that JIT, as a philosophy and as a set of practices, could be found in different business functions such as purchasing. JIT purchasing is an area that draws a lot of researchers' attention due to its important role in a firm. Waters-Fuller (1996) shows that purchased materials and services account for between 50 percent and 80 percent of the total cost of a manufacturing product. It is further estimated that suppliers account for 30 percent of the quality problems and 80 percent of the product lead-time.

The research in this area has examined the practices, benefits as well as the difficulties, of implementing JIT purchasing (Schonberger and Gilbert 1983, Ansari and Modarress 1986, Lawrence and Lewis 1994). JIT purchasing includes a larger number of practices such as developing supplier-buyer relationships, frequent and reliable deliveries, small shipment size and quality assurance. As for the benefits, JIT purchasing is generally believed to result in improvement of quality, productivity, and profit. To emphasize the benefits and the potential problems that JIT purchasing may bring, several studies have investigated the differences between traditional and JIT purchasing practices (Ansari and Modarress 1988, Freeland 1989).

Literature in the area of JIT purchasing can be divided into three schools of thought according to Waters-Fuller (1996): romantic, pragmatic, and skeptical. Researchers in the romantic school, also known as advocate, argue that JIT purchasing is better than any other traditional form of purchasing and benefits any firms employing it. The pragmatic school agrees that JIT purchasing benefits the buyers, but it potentially causes problems to suppliers, which in turns affects the buyers. Finally, the skeptical school, which opposes the other two, argues that JIT purchasing creates risk of supply disruption and non-competitive prices (Waters-Fuller 1996).

It is to be noted that JIT purchasing, on various occasions, is included as a part of JIT manufacturing, or even used interchangeably with the terminology JIT manufacturing. Hence, it appears that the role of the purchasing function is not clearly defined within the context of the organization. Waters-Fuller (1996) clarifies this by saying that JIT “purchasing and supply” is one of the operational changes required in JIT implementation in an organization. In addition, due to a lack of understanding of the relationship between the purchasing function and the rest of the organization, the majority of studies on JIT purchasing fail to take into account certain organizational practices that support the successful implementation of JIT purchasing.

Recently, there have been very few comprehensive studies on JIT purchasing, while the research in the areas of supplier-buyer relationship (Dyer and Ouchi 1993, Helper and Sako 1995, Handfield *et al.* 2000) and purchasing/sourcing strategy proliferate (Handfield 1994, Humphreys *et al.* 1998). However, it is important to realize

that JIT purchasing practice, in fact, is highly related with the supplier-buyer relationship and purchasing strategy studies. Specifically, building the supplier-buyer relationship is one of the main practices of JIT purchasing, while purchasing strategy regards JIT as one of its main strategies. Moreover, with the emergence of Supply Chain Management in practice as well as in research the purchasing function, especially under JIT purchasing becomes even more interesting. The reason is that the purchasing function is where the firms in a supply chain directly interact with each other.

In a country like Vietnam – where the industrial base is still weak and mainly focused on manufacturing with little new product development – JIT purchasing can make a crucial contribution. It can provide manufacturing firms with significant and necessary advantages to compete locally and internationally. Due to increasingly strong competition, managers in Vietnam need practical tools. Yet considering the operating environment, its unlikely that many of the management tools suggested in theory could be implemented, because of various reasons such as the poor infrastructure, scarcity of R&D and lack of financial resources. However, JIT purchasing may be possible. Therefore, if JIT can be considered to be on a continuum of the manufacturing improvement processes, Vietnamese manufacturing appears to be at the stage where JIT may be the current step to take.

Furthermore, if JIT purchasing is indeed implemented in Vietnam, it is most likely that it would have very different characteristics. Therefore, the result of a study on JIT purchasing in Vietnam may differ from studies conducted in the past in other

countries like US, Japan, and Mexico. The manufacturing sector in Vietnam, which was extremely underdeveloped until two decades ago, has gone through significant changes and reforms in the last few years. The annual growth rate of various industries has reached an average of 14% (The Vietnamese-American Business Bridge 1997). This reflects significant improvements of the economy, yet the operational environment is rather chaotic as the country is still going through radical changes. Thus, JIT implementation would face many obstacles. On the other hand the Vietnamese culture, which places a strong emphasis on personal relationships, creates a good environment for developing supplier-buyers relationships, a crucial practice of JIT purchasing. As a result, a study in a developing country like Vietnam would contribute significantly to this area of research, particularly when shifting production to less developed countries is an emerging worldwide practice.

This study is conducted first to find out to what extent JIT purchasing is implemented in Vietnam and second, to investigate how the practices of JIT purchasing affect the performance of a manufacturing firm. It also explores whether firm size and type of ownership have any impact on the implementation of JIT purchasing and on the effect that JIT purchasing has on performance. A firm size is classified as either large, medium or small. The size of a firm reflects its accessible resources, thereby its ability to implement JIT purchasing. Specifically, in the case of Vietnam, smaller companies are unlikely to have access to any external financial resources. That means there are severe constraints as to what management tools they may and may not implement. Thus, it is predicted that the larger the company, the more likely it will be to implement JIT

purchasing. If JIT purchasing exists, it is also suggested that the larger the firm, the stronger JIT purchasing influences firm performance. Similarly, ownership types of firms are also highly likely to affect the implementation of JIT purchasing in the case of Vietnam. It is largely due to the fact that different types of firms in Vietnam are subjected to different sets of regulations, which makes it more or less feasible for a particular firm to implement JIT purchasing. The types of ownership are categorized into three groups: state-owned, private, and foreign-invested (including foreign subsidiaries, foreign wholly owned companies and joint ventures). It is suspected that foreign-invested companies are likely to implement JIT purchasing at a higher level than state-owned or private enterprises. The practices of JIT purchasing are categorized into operational, supplier-buyer development and organizational practices. Firm performance is discussed in four dimensions: quality, costs, productivity, and lead-time.

The sample size of the study is comprised of 54 companies in 14 industries. The results of the research indicate that firm size and ownership type indeed affect the extent of adoption of JIT purchasing. However, they do not strongly support the hypothesis that JIT purchasing affects firm performance. In fact, the research results are sufficient to indicate that only product quality is affected by JIT purchasing. Furthermore, there is a lack of support for any significant impact that size and ownership type have on the influence of JIT purchasing on firm performance. However, it is important to realize that the sample size in this study is relatively small compared to the number of the variables and the selection method is likely to result in bias. Thus, one should only generalize the results of this study with caution.

The thesis consists of six chapters. The first chapter introduces the study. In the second chapter, a literature review on JIT purchasing, performance, firm size and ownership is presented. In addition, the relationships between JIT purchasing and performance, between firm size as well as ownership type and JIT purchasing are reviewed. The theoretical framework including research objectives and hypotheses are developed in chapter three, followed by the methodology in the fourth chapter. Chapter five presents the findings of the study in the case of Vietnam. Chapter six highlights the implications and the limitations of this study as well as lays out the conclusions drawn from the research.

CHAPTER 2

LITERATURE REVIEW

This chapter presents an overview of the literature on JIT purchasing as well as the rationale behind the current study. First, definitions of JIT purchasing and its characteristics are presented. Second, practices of JIT purchasing are examined to select the appropriate ones for this study. Third, the effects of these chosen characteristics on firm performance are discussed. Finally, the discussion about the impact of plant size and ownership type is presented.

2.1. Just-In-Time Purchasing

2.1.1. JIT Purchasing Definition

Just-in-time is defined as “a multi-faceted philosophy that goes far beyond simply having items delivered or manufactured ‘just-in-time’” (Willis *et al.* 1989, p. 23), which aims at eliminating waste. JIT purchasing, in line with the just-in-time concept, is generally believed to be a way to eliminate waste. Yet it is recognized that “the precise characteristics of JIT purchasing are difficult to define” (Freeland 1989). Different researchers in the field of operations management offer varying definitions of JIT purchasing. In addition, due to the abstract nature of the concept, authors frequently employ a set of practices or characteristics, by comparing JIT purchasing with traditional or conventional purchasing to define JIT purchasing. Furthermore, JIT purchasing and JIT manufacturing are sometimes used interchangeably because of some of their identical practices. This confusion makes it even more difficult to define JIT purchasing. Table 1

presents the definitions of JIT purchasing from several well-known studies in this research area.

Table 1

Definitions of Just-In-Time Purchasing in the Literature

Schonberger and Gilbert (1983): “The just-in-time concept as applied to purchasing translates into frequent releases and deliveries. ... The ideal, in the Japanese view of JIT purchasing, is zero buffer inventory via one-at-a-time continuous delivery from supplier to user” (p. 56)

Ansari and Modarress (1988): JIT purchasing is defined through eight selected activities with their characteristics that are generally considered important (p. 20)

Burton (1988): The basis of JIT sourcing is to streamline material flows, reduce manufacturer and supplier costs, increase quality and service to create long-term relationships with chosen suppliers

Freeland (1989): “Set of techniques and concepts for eliminating waste and inefficiency in the purchasing process” (p. 4)

Mehra and Inman (1992): Purchasing strategy is identified as one of the critical elements of JIT implementation where JIT is, in particular, “a vendor strategy that yields a higher level of productivity and quality by minimizing vendor lot sizes and their lead time through the use of sole sourcing and quality certification of suppliers” (p. 172)

Lawrence and Lewis (1994): JIT purchasing requires suppliers to make frequent, reliable deliveries of small lots of very high quality parts (often directly to the production area) and to participate in the purchasing plants continuous improvement efforts (p. 3)

Waters-Fuller (1995): JIT purchasing is an operational change required by the implementation of JIT, and defined through eight different aspects (p. 220)

Gonzalez-Benito and Spring (2000): “there exists a particular form of managing the purchasing function in JIT environment, and it is known as JIT purchasing” (p. 1039)

De Toni and Nassimbeni (2000): “Within the operations management studies, a specific stream of research analyses issues concerning JIT buyer-supplier interaction, namely the ‘JIT Purchasing’ stream of contribution” (p. 632)

Schonberger and Gilbert (1983) define that JIT purchasing means frequent releases and deliveries, in which buffer inventory is maintained at zero level via one-at-a-time continuous delivery from supplier to user (p. 56). This definition reflects one of the most essential impacts of JIT purchasing, which is to maintain zero inventories at all points of the whole production process. In other words, Schonberger and Gilbert's definition focuses on operational issues of the early stage of implementing JIT purchasing. Diverting from the emphasis on zero inventories to examine underlying concepts of JIT, De Toni and Nassimbeni (2000) define that JIT purchasing focuses on the interaction between buyers and suppliers in a JIT manner (p. 632). This definition reflects a shift in focus of JIT purchasing, in which the relationship between buyers and suppliers is the most important and frequent deliveries as well as high quality follow as a natural result.

Other authors, instead of providing a specific definition, determine JIT purchasing through its practices. For instance, Ansari and Modarress (1988) lay out the distinct characteristics of eight major activities of JIT purchasing. These activities include purchase lot-size, number of suppliers, supplier selection and evaluations, bidding, packaging, and paperwork. Similarly, Freeland (1994) defines JIT purchasing as a set of techniques and concepts, and clarifies its nature by comparing JIT purchasing with conventional purchasing on ten different aspects.

Some studies define JIT purchasing in a way that acknowledges the distinction as well as the relationship between the general philosophy of JIT and the implementation of

JIT in the purchasing area. For example, Waters-Fuller (1995) suggests that JIT purchasing is an operational change required by the implementation of JIT (p. 220). According to Mehra and Inman (1992), purchasing strategy is identified as one of the critical elements of JIT implementation. In this study, the authors consider JIT as “a vendor strategy that yields higher levels of productivity and quality by minimizing vendor lot sizes and their lead time through the use of sole sourcing and quality certification of suppliers” (p. 172). Based on Mehra and Inman’s paper, González-Benito and Spring (2000) propose that “there exists a particular form of managing the purchasing function in the JIT environment, and it is known as JIT purchasing” (p. 1039).

This paper will define JIT purchasing as a form of managing the purchasing function that aims at reducing waste and inefficiency in the purchasing process. JIT purchasing constitutes a set of practices that are implemented partly in the purchasing department and partly in the organization as a whole. This definition recognizes the necessity to consider purchasing as an integrated function of an organization.

2.1.2. JIT Purchasing Characteristics

Different researchers propose a variety of characteristics or practices that fall under the concept of JIT purchasing. This suggests a lack of consensus in the literature of this area. To worsen the confusion, different authors may list the same practices/characteristics under different names. The following is an analysis of the practices of JIT purchasing from selected studies. There is a vague distinction among the terminologies ‘practices’, ‘characteristics’, ‘activities’, and ‘aspects’ in the literature of

JIT purchasing, thus they are considered bearing the same meaning. For this study, the term “practices” is adopted.

Schonberger and Gilbert’s (1983) research, one of the most influential studies in this field, reviews the characteristics and benefits of JIT purchasing. It also suggests how this concept could be applied to US manufacturers, given the differences between Japan and the US. The paper divides JIT purchasing characteristics into four groups namely *suppliers* (i.e. number, location, longevity, and assistance/advice offered), *quantities* (i.e. product outputs, part inputs, contract administered, and purchasing paperwork), *quality* (specifications, coordination, and control), and *shipping* (i.e. in-bound freight and freight/storage modes) (Figure 1).

Figure 1 : Schonberger and Gilbert (1983)

JIT Purchasing Characteristics	
Suppliers	Few suppliers, Nearby suppliers, Repeat business with the same suppliers, Active use of analysis, Clusters of remote suppliers, Limited competitive bidding, Buyers plant resists vertical integration and subsequent wipeout of supplier business, Suppliers encouraged to extend JIT buying to their suppliers
Quantities	Steady output rate, Frequent delivers in small lot quantities, Long-term contract agreement, Minimal release paperwork, Variable delivery quantities, Suppliers packaging in exact quantities, Suppliers reducing their production lot sizes
Quality	Minimum product specifications imposed on supplier, Help supplier to meet quality requirements, Close relationships between buyers’ and suppliers’ quality assurance people, Suppliers encouraged to use process control charts instead of lot sampling inspection.
Shipping	Schedule of inbound freight, Gain control by use of company-owned or contract shipping, contract warehousing and trailers for freight consolidation/storage where possible – instead of using common carriers.

It is worthwhile to notice that some of the practices are not implemented in the buyer organization but in the seller organization (e.g. suppliers are encouraged to reduce their production lot size and extend JIT buying to their suppliers). This reflects a high level of inter-organizational integration that JIT purchasing requires to be implemented successfully and benefits both buyers and suppliers.

In Ansari and Modarress (1988) the characteristics of eight activities of the purchasing function under JIT purchasing strategy are presented (Figure 2). The companies included in this study are General Motors Buick Division, Hewlett-Packard Greeley Division, Nissan Smyrna Plant, and Kawasaki Lincoln Plant, which all are currently using JIT purchasing. The eight activities, identified through interviews with purchasing and personnel managers, are generally considered important in improving productivity and product quality. The interviews cover areas such as engineering/design, purchasing, production, transportation/traffic, storage/warehouse, and quality control.

Figure 2 : Ansari and Modarress (1988)

Activities	Characteristics
Purchase lot-size	Exact quantity in small lot-sizes
Number of suppliers	Smaller number – ideally one for each material or class of parts
Supplier selection and evaluation	Based on quality, mutual relationships, delivery, performance, etc.
Quality inspection	Performed at supplier plants
Design specifications	More freedom allowed to suppliers in ways to meet design specifications
Bidding	No annual rebidding with the same suppliers
Packaging	Standard containers utilized
Paperwork	Minimal paperwork, informal

The selection of interviewees, the areas covered and the activities identified make this study a very interesting one in which the interrelation between the purchasing function and the other functions of a manufacturing company is revealed. JIT purchasing influences not only the purchasing department but also others in the organization. As a result, it stresses the difficulty of defining JIT purchasing and determining its characteristics.

Freeland (1989) compares JIT purchasing with conventional purchasing in terms of ten characteristics (Figure 3) to highlight their differences. These characteristics are used as guideline to determine whether a company has a formal JIT purchasing program in place. The study then conducts a survey of sixty employees of a broad base of US companies to find out exactly what practices are implemented in JIT and non-JIT companies to achieve those characteristics.

Figure 3 : Freeland (1989)

Characteristics	Practices
Small delivery lot size	Supplier selection (product quality, service quality, product price, proximity)
Synchronization	Part selection (quality, dollar value, unit volume, costs, supplier proximity, size, technically complex)
Few suppliers	Contractual agreements (frequency of delivery, minimum quantity, price, length of contract, penalties for non-performance, allowances for prices changes, stipulation)
Long-term purchasing agreement	Ordering and delivering policies (frequency of deliveries, Kanban system, MRP system)
Commonality of parts	Information exchange (quality control data, Supplier's VC/unit, supplier's cost/unit)
Extensive exchange of information	
Role of purchasing agents	
Buyers provide support to suppliers	
Geographic proximity	

Among the conclusions, few call for special attention. First, the distance between supplier and buyer is not an important criterion in deciding which parts to purchase on a JIT basis. However, being geographically separated is a major impairment to the implementation process. Second, JIT purchasing does not imply sole sourcing even though it does encourage a small base of suppliers for each part. Third, there is little difference in the ordering and delivery policies for JIT and non-JIT items. This finding is particular interesting since it is quite different from what one would expect from a company with JIT purchasing program. This study raises a few important questions; is it because it compares the order and delivery policies between JIT and non-JIT items, instead of between JIT and non-JIT companies? Is it because JIT purchasing in practice is different from JIT purchasing in theory? It is possible that the theory, being so abstract, does not have a concrete set of practices that truly reflect the philosophy, or are there perhaps different levels of implementing JIT purchasing?

Figure 4 : Lawrence and Lewis (1994)

JIT Purchasing requires
Frequent, reliable deliveries
Small lot size
Very high quality
Supplier's involvement in improvement activities

While many authors define JIT purchasing through a long list of practices, Lawrence and Lewis (1994) narrow JIT purchasing characteristics down to four items: frequent and reliable deliveries, small lot sizes, very high quality and suppliers' involvement in continuous improvement efforts of buyers (Figure 4). These practices are considered the core of JIT purchasing yet should not be considered an exhaustive list of

practices. This research takes the case study approach to investigate five plants in Mexico, of which four are US subsidiaries and one is Mexican owned, having close ties with several US companies. An extensive analysis of these five plants concludes that JIT purchasing can be used successfully in Mexico, at least by some plants. While some manufacturers can overcome the obstacles of JIT deliveries, none has been able to achieve a high level of supplier involvement in improvement efforts at their plant.

Lawrence and Lewis (1996) also investigate the use of JIT purchasing in Mexico, but on a larger scale. A survey is included of general managers from 124 plants located in Mexico, all of which are affiliated with US companies. From fourteen questionnaire items, the factor analysis leads to four factors of JIT purchasing practice: supplier involvement (practices included are communication with suppliers, suppliers' understanding of product and process, suppliers' visits to the plant, and a striving for long-term relationships), JIT deliveries (measured by on-time deliveries, direct and frequent deliveries, and inventory level of purchased materials), supplier selection (including the practices of having a small number of high quality suppliers or multiple suppliers, and the use of cost as the most important selection criteria), and inspection (meaning whether incoming inspection is performed). The result of this study is then compared with the case study conducted by the same authors in Mexico in 1994. The main conclusion drawn from these two studies is that the applicability of JIT purchasing principles is not limited to plants in developed countries. At the least, these particular practices are applicable in the environment of Mexico, a developing country.

Waters-Fuller (1995), through reviewing the literature of JIT purchasing, presents a list of eight main practices of JIT purchasing (Figure 5). The author says that these eight practices do not necessarily constitute JIT purchasing, but rather are considered effective in contributing to a firm's competitive position. Waters-Fuller describes these practices from the point of view of the three schools of thought within the literature of JIT purchasing: romantic, pragmatic, and skeptical. The first group of researchers advocates the use of JIT purchasing and argues that it is a better strategy than other traditional forms of purchasing. Thus, this group is also labeled the advocate school. The second category, taking a more pragmatic view, suggests that JIT purchasing provides many benefits to the buyer in theory. However, many buyers do not practice what is considered essential, creating numerous problems for suppliers, which in turn affects the buyers. The final group takes the opposite view and argues that JIT purchasing is inefficient. It opens companies to risk of supply disruption and non-competitive prices. These authors are labeled as the skeptical school.

Figure 5 : Waters-Fuller (1995)

Aspects of JIT Purchasing
Single Sourcing
Long-term contracts
Total quality suppliers
Dependable deliveries
Directly
An interposed warehouse
Small lot size
Exchange of data
Reduce supplier costs
Stable schedules

Each practice is examined from all three different perspectives. For instance, the advocate school strongly supports the use of single sourcing. It ensures that the buyer is an important customer to the supplier and that developing supplier-buyer relationship receives adequate attention. It is believed that sole sourcing is able to eliminate waste and improve quality. However, the skeptical school argues that sole sourcing increases the risk of supply disruption and chance of suffering non-competitive prices for buyers. As a result, many companies in practice choose to have a second source or cross-source (i.e. utilizing duplicate or potential capacity on the part of the suppliers). Due to the approach, Waters-Fuller's study is able to demonstrate the pros and cons of each practice, as well as the controversy over each of them among different schools of thought.

Figure 6 : De Toni and Nassimbeni (2000)

Class of practices	Practices
"Operational" practices	Product/process development: supplier involvement exchange of information Product planning and scheduling: integrated Delivery: synchronized
"Supplier development" practices	Supplier selection and monitoring Supplier assistance and training Supplier incentives Supplier organizational integration

De Toni and Nassimbeni (2000) begin their paper by acknowledging the shortfall of previous research. They state that the literature of JIT purchasing often fails to adequately take into account existing organizational theory perspectives, when exploring the determinants of effective JIT supply relationships (p. 632). The JIT purchasing stream of literature, as mentioned earlier is a specific stream of research, analyzing issues

concerning JIT buyer – supplier interaction within the study of operations management. The authors argue that developing relationship between suppliers and buyers is the most crucial activity of the purchasing function if JIT purchasing is to be implemented successfully. JIT purchasing practices therefore are classified into two categories: operational and supplier development (Figure 6). The fact that supplier development is reserved a separate category illustrates the emerging tendency to recognize the importance of building a strong relationship between suppliers and buyers (the underlying concept of JIT purchasing philosophy).

A survey of 52 Italian plants is conducted to examine the relationship between the two sets of practices. The research concludes that the two sets of practices: operational and supplier development are connected. This connection depends on the type of operational interaction, where operational practices comprise three underlying factors: quality link (i.e. practices included are supplier quality certification, and information exchange concerning quality), logistics link (i.e. practices included are integrated production planning, kanban, deliveries synchronization, and packaging congruence), and design link (i.e. practices included are supplier involvement in product development, information exchange on production, and information exchange on production processes).

According to González-Benito and Spring (2000), two distinct components of JIT purchasing are proposed. The first component is operational or logistics, comprised of those practices that directly affect the flow of materials as well as production planning.

The second is organizational, encompassing those peripheral practices that contribute to the efficiency and good working of the operational practices (Figure 7). Operational practices are inherent in JIT while organizational practices are similar to the characteristics of partnership sourcing. In other words, it can be considered that JIT purchasing, in its most general implementation, is a kind of partnership sourcing in which special attention is paid to certain operational and logistics practices. This again demonstrates the increasing recognition of JIT purchasing philosophy in which the relationship is focused with the goal of benefiting both suppliers and buyers.

Figure 7 : González-Benito and Spring (2000)

Operational Practices	Organizational Practices		
	Relational practices	Involvement practices	Quality practices
Frequent delivery (small batch sizing)	Benefit sharing (risk sharing)	Supplier involvement in design and development	Quality certification
Reduced inventory	Mutual assistant	Supplier development programs	Performance control (quality and reliability)
<i>Kanban</i> with suppliers	Relational programs	Training courses	Supplier selection based on quality and reliability
Exact delivery time	Long-term contracts	Engineering visits	
EDI	Lasting relationship		
Geographical concentration	Single source (small numbers)		
Standardized containers	Cost-based price calculation		
	Cost info exchange		
	Frequent comm.		

A survey of 150 automotive suppliers of the Spanish auto industry is conducted to examine whether there are different levels of implementation of JIT. It is concluded that

there are indeed different levels of JIT purchasing implementation in the Spanish auto industry. In fact, organizational practices reach a higher level of implementation than operational practices.

Table 2 summarizes all practices of JIT purchasing in the literature presented above. Similar practices even with different names are considered identical and put under the same headings.

Table 2**Practices of Just-In-Time Purchasing from the Literature**

Few Suppliers or Single sourcing					1	2	5
Nearby suppliers or Geographic concentration					1	3	7
Frequent deliveries in small lot quantities	1	2	3	4	5	7	
Integrated product planning and schedule							6
Synchronization						3	6
Stable schedule							5
Steady output rate							1
Ordering and delivering policies (the use of Kanban, frequent orders)						3	7
Minimal release paper work						1	2
Standards containers utilized						2	7
Commonality of parts							3
Supplier packaging in exact quantities						1	2
Schedule of inbound freight							1
Gain control by use of company-owned methods instead of using common carriers							1
Extensive exchange of information or EDI						3	5 7
Supplier selection and evaluation based on quality, delivery, performance			2	3		6	7
Repeat Business with the same suppliers						1	3
Limited competitive bidding						1	2
Long-term contract agreement			1	3		5	7
Supplier incentives through benefit and risk sharing						6	7
Supplier reducing their production lot sizes							1
Minimum product specifications imposed on supplier							1
Quality performed at supplier plants			2	4		5	7
Help supplier to meet quality requirements						1	3
Close relationships between buyers' and suppliers' quality assurance people						1	3
Suppliers encouraged to use process control charts instead of lot sampling inspection.							1
Use of analysis method to enable desirable suppliers to become/stay price competitive							1
Reduce supplier costs							5
More freedom allowed to suppliers in ways to meet design specifications							2
Supplier assistance and training						6	7
Relational programs							7
Supplier's involvement in improvement activities						4	6
Supplier involvement in design and development							7
Suppliers are encouraged to extend JIT to their suppliers							1
Supplier organizational integration							6

1. Schonberger and Gilbert (1983)
2. Ansari and Modarress (1988)
3. Freeland (1989)
4. Lawrence and Lewis (1994)

5. Waters-Fuller (1995)
6. De Toni and Nassimbeni (2000)
7. González-Benito and Spring (2000)

2.1.3. Integrated JIT Purchasing Practices

The table above shows that most practices are related directly to the purchasing department and its suppliers, ignoring how JIT purchasing fits into overall strategy and how the purchasing function is related to the rest of the organization. In addition, the majority of studies, especially the early ones, in this area tend to list JIT purchasing practices without making an attempt to group them into any meaningful categories. One of the very early studies in JIT purchasing, Schonberger & Gilbert (1983) does categorize JIT purchasing practices into four different groups: suppliers, quantities, quality, and shipping. However, a close look at the practices and the way they are categorized indicates that these practices appear to be viewed from the point of view of the buyer and thus are more concerned with the benefits of JIT purchasing for the buyer, with little regard for what suppliers may gain or lose from the implementation of JIT purchasing of their buyers. Even though some practices are considered beneficial to suppliers, such as long-term contracts and repeat business with the same suppliers, it does not reflect the underlying mutual cooperation between buyers and suppliers. Later in the study, the benefits of JIT for suppliers are also mentioned, yet it did not reflect the risk and benefit sharing mentality of the recent studies in JIT purchasing. As a result of this narrow view, it also does not consider the interaction of JIT purchasing within the organization as a whole.

Later studies, reflecting the emerging view of JIT purchasing mainly as developing long-term supplier-buyer relationships, have attempted to classify JIT practices into some meaningful categories, considering the benefits of mutual cooperation between suppliers and buyers. For instance, De Toni and Nassimbeni (2000) divide JIT

purchasing practices into two main classes: *operational practices* (i.e. practices that allow the creation of a link between the buyer's and supplier's operations), and *supplier development practices* (i.e. practices that are aimed at maintaining a network of competent suppliers). González-Benito and Spring (2000), similarly to De Toni and Nassimbeni (2000), divide the practices of JIT purchasing into two components: *operational or logistics* (i.e. 'practices that fundamentally affect the flow of incoming materials and production planning') and *organizational or relational* (i.e. 'peripheral practices which contribute to the efficiency and good working of the operational practices').

The latter groups of practices is further divided into three subgroups: *relational practices* (i.e. concerned with establishing such a relational structure through benefit and risk sharing, mutual assistance), *involvement practices* (i.e. intended to empower the supplier in the relationship by providing training and getting suppliers to involve them in designing and developing), and *quality practices* (i.e. concerned with assuring quality, reliability and establishing additional safeguards apart from trust). However, these comprehensive lists above still lack the practices that reflect the role of the purchasing function in an organization and how a firm as a whole may affect the success of its JIT purchasing implementation.

To illustrate the needs that include the practices that go beyond the purchasing department ensuring the success of implementing the JIT purchasing concept, several typical problems of JIT purchasing implementation are analyzed in the following. Ansari

and Modarress (1986) present seven of the most significant problems found in a survey of firms implementing JIT purchasing. They are: (1) lack of support from suppliers, (2) lack of top management support, (3) low product quality, (4) lack of employee readiness and support, (5) lack of support from carrier companies, (6) lack of engineering support, and (7) lack of communication. Later, onsite research of four companies: General Motors – Buick Division, Hewlett-Packard Company – Greeley Division, Kawasaki Motors Corporation USA – Lincoln Plant, and Nissan Motor Manufacturing Corporation USA – Smyrna Plant, shed light onto the underlying causes of these problems. Among these, problems, (2), (4), (6), and (7) are entirely internal issues. It appears that neglecting to include the practices that reflect the consideration of JIT purchasing in the organization-wide context have resulted in more than half of these problems.

It is important to notice that one of the most concerning problems of JIT purchasing discussed in literature is whether there is a shift of costs and inventory stocking from the buyers to the suppliers. Researchers in this particular area have argued strongly for both possibilities. For example, O’Neal (1987) found evidence of shifting costs from buyers to suppliers. Furthermore, Freeland (1991) as well as Gupta and Heragu (1991) found that suppliers are forced to hold inventory for their customers. On the other hand, Hall (1983) and Schonberger and Gilbert (1983) argued that this is a misconception because if JIT purchasing is implemented properly, suppliers are also able to reduce their own inventory level. In addition, they would benefit in terms of cost reduction and quality improvement in the long run. The field of studies that investigates JIT purchasing from the suppliers’ point of view, proves that the implementation of JIT

purchasing in the buyer organizations may raise various problems to the suppliers. However, this study will not deal with this particular issue of shifting costs and inventory carrying.

Table 2 also reveals another concern of JIT purchasing literature, which is the confusion caused by the use of different names for the same practices. It increases the difficulty of developing a complete list of practices that comprise JIT purchasing. In addition, the recognition that the practices of JIT are interrelated makes it even more difficult to distinguish and categorize those practices. De Toni and Nassimbeni (2000) support this interconnection and are successful in demonstrating that the set of operational practices and the set of supplier development practices of JIT purchasing are statistically correlated. A specific example is the connection of a subgroup of operational practices including information exchange on product, supplier involvement in product development, and information exchange on process, to three supplier development practices, namely contractual incentives, supplier assistance and training, and organizational integration devices. Different practices appear to have a causal-effect relationship, which makes it even more difficult to separate them. This poses the challenge of clearly distinguishing different practices and reflecting such distinction in the process of collecting data, to ensure that the respondents also have a good understanding of each practice.

Previous studies also reveal another obstacle in researching JIT purchasing, which is a lack of the clear distinction between practices defined in theory and those actually

implemented. Freeland (1989) says that earlier studies have shown that people in purchasing were sometimes confused about whether or not they used JIT purchasing practices. That means in practice employees are not always aware of what comprises JIT purchasing or the practices used in their companies were defined differently causing confusion. That would probably be the reason why he found that there are no differences between firms with JIT purchasing and those without it where differences were expected to be found. Thus, it is a challenge to ensure that the practices in theory and in reality match and that respondents have a clear idea of what each practice is and whether they have them in their organizations.

This paper, therefore, intends to compile a complete list of JIT purchasing practices that take into account both the external and internal ties that a JIT purchasing function has. The main structure of the categorization is based on two studies: De Toni and Nassimbeni (2000) and González-Benito and Spring (2000). However, the practices are derived from not only the literature of JIT purchasing, but also the literature of JIT manufacturing, and the supplier-buyer relationship when applicable.

Tables 3 presents the list of JIT purchasing practices that are selected for this study. The practices are divided into three main categories: operational, supplier-development, and organizational. Operational practices include those that allow for the creation of a link between operations of a buyer and a supplier (De Toni and Nassimbeni 2000) to ensure integrated product scheduling and planning. Supplier-buyer relationship development practices are those that aim at building a network of committed and

competent suppliers from which both suppliers and buyers would benefit. The first two groups of practices, affecting the direct interaction between buyers and sellers, aim at ensuring the smooth flow of materials, production planning and the necessary cooperation between buyers and sellers. The third group (organizational) is composed of those practices that contribute to the efficiency of the JIT purchasing implementation.

Table 3**Integrated Practices of Just-In-Time Purchasing****Operational Practices**

- Integrated product planning and scheduling
 - Frequent deliveries and small lot sizes
 - Synchronization between contracting orders and scheduling activities
 - Synchronization between deliveries and production requirements
- Reusable standards containers: in the production process
- Maximizing the commonality of parts
- Intense exchange of information concerning costs
- Minimization of paper work
- Control over transportation means and warehouses
- Quality improvement and quality inspection
 - Exchange of information on quality
 - Quality at source: parts are inspected at suppliers' plants
 - Suppliers effort to emphasize continuous quality improvement
- Supplier involvement in product / process development
 - Continuous exchange of information concerning products / processes
 - Frequent visits
 - Liaisons to ensure the flow of information

Supplier- buyer Relationship Development Practices

- Maintain a very small number of suppliers
- Supplier selection and evaluation
 - Selection criteria including quality, cost, geographical proximity, involvement
 - Evaluation criteria including cost, quality, involvement
- Supplier assistance and training
 - Technical and financial support including providing training courses
 - Collaborating to reduce supplier's costs and improve quality
 - Join-effort to solve problems arisen
- Supplier incentives
 - Long-term contracts and allowance for adjustments
 - Limited competitive bidding
 - Formal and informal commitment to build trust and lasting relationship
- Encouragement to implement JIT purchasing in the suppliers' organizations
- Supplier organizational integration

Organizational Practices

- Information sharing
- Cross-functional cooperation and teams
- Matching strategies
- Management's commitment and support

2.2. The Effect of JIT Purchasing on Performance

Firm performance can be measured in various ways depending on the criteria used. Performance measures are used to ensure the achievement of the firms' goals and objectives, and allow firms to compare their performance to that of other firms. Thus this section will provide a discussion on performance measurement in general and the effect of JIT purchasing on performance as seen in past literature.

2.2.1. Performance Measurement

Performance measurement in the literature is divided into two phases. The first phase went until the 1980s, emphasizing financial measures such as profit, return on investment and productivity. The second phase started in the 1980s as a result of numerous changes in the world market (Ghalayini and Noble 1996). Traditional financial measures are criticized for their limitations in helping firms evaluate their performance in the new operational environment, since they are short-term oriented and unable to provide information on issues such as quality, flexibility, and customer satisfaction. Due to various reasons such as increasing competition and the advancement of information technology, performance measurement has gone through a revolution to seek better ways of reflecting both financial and non-financial information (Neely 1999). However, it is not always easy to determine what measures a particular firm should adopt and for how long it should maintain these measurements (Neely 1999). It is important to recognize that each firm should adopt those measures that best evaluate their goals and objectives. Furthermore, firms should remain flexible to change those measures to adjust with changes in the organization as well as in their operational environment.

The issue of performance measurement in the context of Just-In-Time is very important since this is the decisive factor to convince firms to implement such changes. Inappropriate performance measures have the potential of not only misrepresenting, but also undermining JIT efforts (Upton 1998). When discussing performance, JIT purchasing literature mainly implies quality, cost, productivity, and lead-time. Following, these four measures of firm performance: quality, costs, productivity, and lead-time are discussed further.

Quality has been one of the most talked about topics in literature yet it is not easy to define since different disciplines can view it from very different angles (Garvin 1984). Garvin (1984) also suggests that there are five approaches to the definition of quality depending on the views and purposes: (1) the transcendent approach of philosophy; (2) the product-based approach of economics; (3) the user-based approach of economics, marketing, and operational environment; (4) the manufacturing-based; and (5) the value-based approaches of operations management (p. 25). Garvin goes on to identify eight dimensions of product quality: *performance* (i.e. primary operating characteristics of a product), *features* (i.e. secondary characteristics that supplement the product's basic functioning), *reliability* (i.e. reflects the probability of a product's failing within a specified period of time), *conformance* (i.e. the degree to which a product's design and operating characteristics match preestablished standards), *durability* (i.e. a measure of product life), *serviceability* (i.e. speed, courtesy, and competence of repair), *aesthetics* (i.e. how a product looks, feels, sounds, tastes, or smells), and *perceived quality* (i.e. perception of individuals about the quality of a product).

Cost and productivity are the two popular and related measures of firm performance. There are different kinds of cost such as part costs, variable cost in term of units, overhead costs and total costs. Similarly, there are different forms of productivity: partial productivity, total factory productivity, and total productivity. Partial productivity is defined as “the ratio of total output to one class of input”. Total factory productivity is defined as “the ratio of total output to the sum of associated labor and capital (factors) inputs”. Finally, total productivity is defined as “the ratio of total output to all input factors” (Ghalayini and Noble 1996).

Generally, lead-time is defined as the time necessary to deliver an order. The beginning and ending point of the time interval depend on the organizations and the functions in a particular organization. For the marketer, it is between the time orders are placed by customers and the time the orders are delivered. For the purchasing department, lead-time becomes the time interval between ordering and receiving the order of parts or materials. Therefore, cumulative lead-time of a manufacturer is the sum of the lead times that sequential phases of a process require, from ordering of parts or materials to completion of final assembly (Stevenson 1999). For a production process, Hahn *et al.* (1983) identifies four components of lead-time: administrative time to process the order, manufacturing time, transportation time, and receiving and inspection time.

The effect of JIT purchasing on quality, cost, productivity, and lead-time will be discussed as follows. In addition, the research results of various studies investigating the influence of JIT purchasing on firm performance will be presented.

2.2.2. JIT Purchasing and Firm Performance

The Effects of JIT Purchasing on Quality

JIT purchasing is most likely to affect the product quality in terms of conformance. First, the use of small number of suppliers and the emphasis on maintaining a long-term relationship with suppliers increases supplier loyalty. Thus, suppliers are more willing to invest time and resources to not only guarantee but also improve quality. Second, the readiness to assist suppliers on different fronts provides suppliers with resources and incentives to pursue continuous quality improvement (Ansari and Modarress 1988). Third, quality inspection at the source and small shipments allow fast detection and correction of defects (Schonberger and Gilbert 1983).

Fourth, intense exchange of information on quality assures that both suppliers and buyers are informed of problems concerned with quality and may organize joint effort to solve them. Fifth, maintaining low part inventories under JIT purchasing program also means less part deterioration or obsolescence. Finally, supplier-buyer cooperation, which allows buyers to contribute to the product design process, ensures that suppliers are fully aware of buyers' quality requirements and the buyers are familiar with suppliers' capabilities to meet those demands in advance (Ansari and Modarress 1988). Such a supplier involvement also affects the 'performance' dimension of product quality.

The Effects of JIT Purchasing on Cost

The effects of JIT purchasing on costs are conflicting. Generally, many researches argue that its implementation mainly affects part costs, thereafter variable cost per unit

(Freeland 1989). Furthermore, total cost is also reduced by the reduction in processing costs due to an integrated production planning process. Little effort and resources are required to process order paperwork for both buyers and suppliers. Third, since suppliers and buyers embarked on a long-term relationship, long-term contracts and limited annual bidding lower overhead costs (Ansari and Modarress 1988). Fourth, inventory – carrying costs decrease significantly due to extremely low inventory levels (Schonberger and Gilbert 1983). Besides, low inventory levels also reduce the potential costs due to deterioration and obsolescence of stock.

Fifth, quality at source and small deliveries lower quality inspection cost and rework cost. Furthermore, assurance of a stable long-term relationship with suppliers and supplier assistance from buyers provide suppliers with the necessary resources and assurances to reduce their own costs. These savings can in turn be shared with buyers in the form of lower part prices. Even though the skeptical school of thought argues that the use of a small number of suppliers increases the opportunity cost due to supply disruption risk and non-competitive prices, it has been shown that a long-term and collaborating relationship reduces both risk and supply price.

JIT purchasing, however, may indeed increase overhead costs due to initial investment in implementing it and in assisting the suppliers. Specifically, Lawrence and Lewis (1994) find that the costs to develop suppliers capable of supporting a JIT purchasing program in Mexico is higher than in US. In addition, the need for using foreign suppliers to ensure quality translates into higher material management and

inventory costs even under JIT purchasing. Therefore, the savings that JIT purchasing brings is lower than its implementation cost. The only reason that costs remain low in Mexican plants is solely due to cheap labor costs and other overhead categories. It is most likely that Mexico is not the only developing country where the benefits of JIT purchasing may not be sufficient to cover its costs of implementation.

The Effects of JIT Purchasing on Productivity

The reduction of costs due to JIT purchasing is a main source of improving productivity (i.e. less input for a given level of output) (Schonberger and Gilbert, 1983). In addition, small lot sizes with frequent deliveries, implying lower inventory and scrap level, high quality, lower inspection costs for incoming parts and earlier detection of defects, contribute to higher productivity. Moreover, the use of standard containers holding small and precise quantities of each part not only reduces waste and fastens the handling process, but also generates a positive attitude among workers. This facilitates workers to pay more attention to the few parts left and avoids the attitude that parts, appearing abundant, can be wasted. As a result, productivity increases (Ansari and Modarress 1988). Finally, supplier involvement means that buyers have the opportunity to utilize suppliers' expertise to improve product and process designs to raise productivity.

The Effects of JIT Purchasing on Lead-Time

The four components of lead-time: administrative time, manufacturing time, transportation time, and receiving and inspection time, defined by *Hahn et al.* (1983) are

used to illustrate how JIT purchasing reduces lead-time for a manufacturer. First, JIT purchasing suggests that the amount of order paperwork decreases significantly due to long-term contract and production integration. Thus, administration time is reduced. Second, close proximity to suppliers suggests shorter transportation time. Third, on-time and reliable deliveries eliminate possible delays, which contributes to reducing manufacturing time. Finally, high quality suppliers and quality assurance lead to reduced receiving and inspection time. In general, JIT purchasing has the effect of reducing the cumulative lead-time.

Studies on the Effects of JIT Purchasing on Performance

Different researchers present various frameworks to relate the practices of JIT purchasing to the firm performance. The benefits of JIT purchasing found may go beyond the four dimensions of firm performance proposed in this study such as efficiency and flexibility. However, this study selects the performance measures discussed above that are most common and most applicable in the case of a developing country.

Schonberger and Gilbert (1983) propose that the benefits of JIT purchasing mainly include decreasing material costs (i.e. through reducing inventory carrying costs, part costs, transportation costs, and scrap costs), improving quality (i.e. through fast detection and correction of defects, less need of lot inspection, and higher part quality), and increasing productivity (i.e. through reducing material costs rework, inspection, delay, and control costs). Even though Schonberger and Gilbert argue for those benefits, they do not support their conclusion with an empirical study. Their study simply argues

that JIT purchasing benefits both buyers and suppliers, and JIT purchasing also has the potential to provide significant strategic advantages for those that employ the concept. In conclusion, Schonberger and Gilbert indicate that there exist obstacles, particularly geographical vastness, to widely implement JIT purchasing in the US. However, the companies that have pioneered in the development of JIT purchasing the US have demonstrated that most of the obstacles are not insurmountable. This study shows that the philosophy of JIT, though originated in Japan, could be applied to manufacturers in other parts of the world with modification to yield the same success.

Ansari and Modarress (1988) study the effects of major activities of JIT purchasing on product quality and productivity in four manufacturers: General Motors Buick Division, Hewlett-Packard Greeley Division, Nissan Smyrna Plant, and Kawasaki Lincoln Plant. From the interviews within these plants, the authors draw the conclusion that JIT purchasing indeed improves product quality and productivity. Specifically, small and exact purchase lot-size, very small number of suppliers, clear supplier selection and evaluation, quality inspection at source, eliminating bidding process for same suppliers, and more freedom for suppliers in terms of design specifications are considered most important or most influential. Packaging with standard containers is considered secondly important and minimal paperwork is judged as least influential. From the questionnaire, Ansari and Modarress are able to prove that purchase lot-size, number of suppliers, supplier selection and evaluation, quality inspection, the bidding process and design specifications are ranked very important in improving productivity and product quality. Packaging was ranked important and paperwork ranked last, fairly important.

Freeland's (1989) survey based on sixty employees in a wide range of US companies concludes that JIT purchasing indeed reduces inventory time and delivery lead time, as well as increases the percentage of on-time deliveries. However, it is perplexing to notice that the average frequency of delivery is reduced as a result of JIT purchasing, instead of increasing. In addition, Freeland observes that a number of benefits of JIT purchasing (i.e. including reducing safety stocks, warehouse space, order-processing time and part costs, as well as improving inventory control, part quality, plant efficiency, and production scheduling) are realized. The author emphasizes that JIT purchasing has modest effect on direct purchased parts' costs per unit, but it should reduce total costs when all savings are taken into account. However, Freeland does not provide any arguments to explain how JIT purchasing affects firm performance.

Lawrence and Lewis (1994) in a study of five manufacturing operations in Mexico compare their plant performance with the performance of their US counterparts. It intends to illustrate how the obstacles of implementing JIT purchasing in Mexico affect its benefits. The authors conclude that JIT purchasing results in lower total costs in Mexico than in US but it is largely due to the lower wages and certain overhead categories. However, the obstacles in Mexico do not affect the benefits of quality improvement of JIT purchasing. However, they affect the ability to improve lead-time of Mexican companies that implement JIT purchasing. They can match their US counterparts only by maintaining a higher level of safety stock. Lawrence and Lewis (1996) extend their study in Mexico by surveying 124 plants in Mexico. In this study, they conclude that JIT delivery and supplier involvement in the buyers' improvement

activities are associated with superior performance. However, superior performance is not defined clearly in the study.

According to De Toni and Nassimbeni (2000), better performing plants exhibit a higher use of JIT purchasing practices. The results of a survey of 52 Italian plants prove that the relationship between performance and JIT purchasing practices indeed exists. Specifically, plants with higher performance tend to have more formalized supplier rating and ranking procedures, use organizational devices for supplier organizational integration and place a stronger emphasis on supplier assistance and training. In addition, the logistics link (i.e. practices included are integrated production planning, kanban, delivery synchronization, and packaging congruence), and design link (i.e. practices included are supplier involvement in product development, information exchange on production, and information exchange on production process) are also significant for better-performing plants.

González-Benito and Spring's (2000) study of the automotive suppliers in Spain leads to the conclusion that companies with high level of implementation of JIT purchasing have higher performance. The dimensions of performance examined are five basic objectives of operations management: quality, dependability, speed, flexibility and costs. Performance is evaluated based on managers' perceptions about their operational capacities with respect to their competitors. The authors also state that the results are especially better if a global implementation of the whole package of JIT purchasing practices is undertaken.

In general, the literature strongly suggests that the implementation of JIT purchasing has an impact on different dimensions of firm performance such as cost, quality, productivity, and lead-time. The ability to measure performance is especially important in implementing JIT purchasing since it would provide concrete results of the effects of its implementation. Despite its importance, the topic of a relationship between JIT purchasing and performance is left with much to examine. Much research in this field argues that the most significant impact of JIT purchasing is to improve performance, yet not all of the studies provide empirical evidence of this. Additionally, a number of studies do not have a clear definition of performance. However, the biggest shortfall of past studies is a lack of quantified information about the improvement of performance. More often than not, performance is measured based on the perception of the respondents rather than on concrete evidence. González-Benito and Spring's (2000) appears to be one of the very few studies that obtain quantified data on firm performance.

2.3. The Effects of Firm Size and Ownership Type

2.3.1. Size and Ownership Definitions

Firms based on size can be classified based on different criteria such as sales volume, number of employees, or its market share compared to other firms in the same industry. In this paper firms are grouped into large, medium or small firm class. The criterion used to categorize firms is based on the results from a business survey in Vietnam conducted in 1995. In the questionnaire (Tran Van Hoa 1997), 81 Vietnamese companies are surveyed. It found that 3.7% of the companies employ less than 30 people, 12.3% employ 31-50 people, 13.6% employ 51-100 people, 19.8% employ 101-200

people, 30.9% employ 201-500 people, and 14.8% employ 500-1000 people. In other words, approximately 26% of companies have less than 100 employees, 30% have between 101-300 employees, and 34% have more than 301 employees. Therefore, in this study, to ensure that each of three groups of firms has equal proportion of representatives in the sample size, reflecting the reality in Vietnam, a firm is considered small if it has less than 100 employees, medium if it has 100 to 300 employees, and large if it has more than 300 employees. However, since Tran Van Hoa's study is relatively old and the number of companies in Vietnam changes radically every year, the specific cutoff points of employee numbers may be changed to ensure the adequate representation of all types of firms.

Ownership of business in Vietnam can be classified into three groups: state owned enterprises, private, and foreign. State owned enterprises are owned and operated by either central or local government. The national statistics indicate that the centrally affiliated enterprises grow by 14.6% per year on average, and locally affiliated by 11%. State-owned companies have gone through various changes in the last few years to ensure their competitiveness in a new operating environment. The second group, private businesses, is the fastest growing sector in Vietnam with the average rate of 23.2% annually. The main forms of private companies are households, limited partnerships and corporations. In the context of this paper, only limited partnership companies and corporations are considered since other forms of private businesses usually comprise very small size businesses. The third group, foreign owned companies, operates in the form of foreign subsidiaries, foreign invested enterprises, and joint ventures. The annual growth

rate for this group of companies is 12.9% on average (The Vietnamese-American Business Bridge 1997). Table 4 presents the industrial production by ownership type in Vietnam (i.e. also referred as Economic Sector in different reports). The statistics indicate that all three groups of companies, especially the private companies (i.e. non-state sector) and foreign, are growing strongly.

Table 4 : Industrial Production by Ownership Type

At constant 1994 prices*	1995	1996	1997	1998	1999	2000
Gross Industrial Production	103,375	118,097	134,420	151,223	168,749	195,321
State Sector	52,991	58,166	64,474	69,463	73,208	82,101
<i>Central</i>	33,920	38,411	42,216	45,677	48,395	53,575
<i>Local</i>	18,071	19,755	22,258	23,285	24,813	28,526
Non-state Sector	25,451	28,369	31,068	33,402	37,027	43,809
<i>Collectives</i>	650	684	751	859	1,076	NA
<i>Private, Households, Mixed</i>	24,810	27,685	30,317	32,544	35,951	NA
Foreign-invested Sector	25,933	31,562	38,878	48,359	58,515	69,411

Sources: World Bank, General Statistical Office, Statistical Yearbook 2000

* In billions of VND (US \$1 $\cong$ 14,000 VND)

2.3.2. The Effects of Firm Size

There are very few studies about how size could affect the implementation and benefits of JIT purchasing. For a few that examine this, the conclusions are controversial. Freeland (1989) presents in his study of US manufactures that there are no differences between JIT and non-JIT companies based on any characteristics of the organizations. That means there is no apparent relationship between the number of workers and the implementation of JIT purchasing in a firm. It could also be argued that as long as the same level of JIT purchasing is implemented, the benefits that different size companies receive should be the similar.

On the other hand, Lawrence and Lewis (1994) argue that plant and company size appears to be a critical factor in determining whether one can overcome obstacles to JIT purchasing. Lawrence and Lewis (1996) also suggest that the company size plays a role in determining the feasibility of pursuing JIT deliveries. The reason is that it requires sufficient investment to develop and support suppliers to operate adequately under JIT purchasing program. Implementing JIT purchasing also requires firms to acquire certain technology platforms to integrate production planning. González-Benito and Spring (2000) support this conclusion in their study by showing that in Spain, firms with larger number of employees are more likely to have a higher degree of implementation of JIT purchasing. Therefore, it appears that firm size can act as a direct factor to effect the implementation of JIT purchasing. At the same time, Lawrence and Lewis (1996) draw out from the survey of Mexican plants that the effectiveness of JIT deliveries is a function of plant size. That means firm size may be considered as a control variable on the effect of JIT purchasing on performance.

Regardless of the small number of research papers that investigate the effect of size on the JIT purchasing implementation, size is suspected to be very important in JIT purchasing implementation in Vietnam. Lawrence and Lewis' (1994, 1996) studies on Mexico, a developing country, lend support to this speculation. Vietnamese manufactures are facing the same challenges that Mexicans are. Local suppliers are likely to require financial and technological support to become the JIT vendors. If international suppliers are involved, ordering and inventory management would require more resources even if

JIT purchasing is implemented. Therefore, it appears that size has a direct effect on the implementation level of JIT purchasing in Vietnam.

It is also possible that size influences the effects of JIT purchasing on performance. For instance, to develop the supplier-buyer relationship, a large firm may need one liaison to ensure the constant flow of information from buyer to supplier. To do so, a small firm cannot employ less than one liaison to do the same thing. Thus, this is translated into higher unit costs for the small firm than for the larger one. Another example is that if both a large firm and a small firm utilize long-term contracts with their suppliers, it is most likely that the suppliers of both firms benefit from the resulting lower costs. However, due to the large capacity of the larger firm, its suppliers are able to take advantage of the economies of scale and reduce costs more than the suppliers of the smaller firm. Therefore, it is suggested that firm size affects the impact JIT purchasing on firm performance.

Generally, the controversy over the effects of firm size on JIT purchasing (i.e. direct or indirect effect) calls for further investigation, especially when developing countries are the research subject.

2.3.3. The Effects of Ownership Type

There exists hardly any research that considers how ownership types affect JIT purchasing. González-Benito and Spring's (2000) study of the Spanish automobile industry briefly mentions that internationalized companies are likely to be more advanced

in the implementation of JIT purchasing. Unfortunately, it is not certain if ownership types translate into the level of international presence in the study. However, it is believed that the ownership type of a firm behaves similarly to its size in terms of affecting the implementation of JIT purchasing in Vietnam. The main reason is that different types of enterprises are subject to different sets of regulations that make it more or less complicated to implement JIT purchasing practices. For example, the Vietnamese banking system has not been able to provide long-term loans to private enterprises. That means private businesses have less opportunity to raise capital to invest in improvements such as JIT purchasing.

In addition, the ownership affects the way a firm is perceived by other firms in terms of management mentality, financial resources, bargaining power, technological expertise, innovation, trust, commitment, and ability to compete. For instance, private enterprises, though growing strongly, usually have limited resources and technology due to their short history. Therefore, suppliers are unlikely to invest resources to develop a long-term relationship for fearing that the buyers may be out of business before the investment is recouped. It suspects that JIT purchasing is most feasible in a foreign owned company and least in a private firm. However, empirical evidence is needed to draw a concrete conclusion. Furthermore, the effects of ownership types on JIT purchasing implementation may be found in other developing countries having similarities in operating environment with Vietnam. Therefore, this is an important factor to include in this study.

2.4. Vietnamese Manufacturing Industry

The Vietnamese manufacturing industry was almost nonexistent until a few decades ago. Today, even though it is still not a strong economic sector of the nation economy, it is growing strongly at the average of 14%. It also received increasing attention and investment from the government as well as foreign investors. Specifically, the capital invested by the state in the industrial sector has increased tenfold and accounts for 55% of the total state investment capital every year. The industrial sector also attracts approximately 50% of foreign investment in Vietnam. Table 5 presents the GDP of the manufacturing sector in Vietnam from 1995 to 2000.

Table 5 : Vietnamese GDP of Manufacturing Sector

	1995	1996	1997	1998	1999	2000
In current prices*	34,318	41,290	51,700	61,906	70,767	82,922
In constant 1994 prices*	30,231	34,339	38,743	42,694	46,105	52,177
Growth rates (%)**		13.6	12.8	10.2	8.0	13.2

Sources: World Bank, General Statistical Office, Statistical Yearbook 2000

* In billions of VND (US \$1 $\cong$ 14,000 VND)

** Based on constant 1994 prices

Until 1986, the large majority of products were produced by state-owned enterprises and distributed according to governmental plans. Thus, surviving was hardly an issue for any companies due to the lack of competition and the shortage of most products. However, the Vietnamese economic development policies have been changed dramatically since 1986. Consequently, different forms of businesses have been gradually allowed, which increased considerably the number of producers of any given product. Especially, after the normalization of the relationship between the U.S. and Vietnam,

which facilitated an increase in the volume of foreign direct investment and mass entering of foreign products, economic and social conditions have changed profoundly. Firms in Vietnam are under great pressure to search for different managerial solutions to compete domestically and expand internationally. Managers are searching for tools to become more competitive. As a developing country competing against highly industrialized nations, Vietnam is under pressure to implement methods that allow its manufacturers to achieve high quality and productivity at competitive prices. The pressure is so grave that it is not unusual to find a large number of companies in Vietnam claiming that they are meeting ISO standards to appear competitive with little knowledge of what ISO really means.

Therefore, it becomes essential to research whether the improvement methods proven to succeed in other countries can be implemented successfully in Vietnam. Unfortunately, management literature on Vietnam is rare. Most of the research studies available target foreign investors or marketers as their audience. Thus the focus is to describe the Vietnamese economic and socio-political environment (Venard 1996, Griffin 1998, Tran 2000), providing limited implications for actual manufacturing managers in Vietnam. Besides, the approach of these studies mainly relies on data published by third parties, showing little interaction with the companies themselves. Hence, the results may not reflect the challenges facing managers. Wright and Nguyen's (2000) paper, which utilizes the interview method with managers from the senior executives of 36 state-owned enterprises, is indeed one of the very few studies that examining management issues in Vietnam demonstrating practical implications to business managers.

Therefore, this paper, which proposes to investigate the use of JIT purchasing in Vietnam using the interview method, has both methodological and practical implications. First, it will become one of earliest researches that engage managers of firms located in Vietnam in the data collection process. This is rather unusual for business managers in Vietnam as well as for the academic environment. This is also believed to offer greater useful results to businesses in Vietnam if the issues are viewed from the point of view of real managers.

Secondly, the topic of JIT purchasing, which is widely believed to be the key of Japanese manufacturing success, promises to be intriguing in the case of Vietnam. On the one hand, under the old economic regulations where only state-owned enterprises existed, no manufacturer had to or was allowed to utilize many managerial practices such as to select their suppliers, contributors, or transportation modes, or to determine inventory level. Hence, most managers especially in the public sector are not familiar with various issues such as building partnerships with suppliers and controlling inventory levels.

On the other hand, the new business environment requires firms to be able to handle inventory management and to ensure good sources of supplies. Vietnamese culture also places a strong emphasis on relationships in conducting businesses. Therefore, a study on the use of JIT purchasing would clarify whether it can be implemented successfully in manufacturers located in Vietnam to improve their competitiveness.

2.5. Summary

Different authors have proposed different sets of JIT purchasing practices, though the main practices are generally on-time, frequent deliveries of small lots and relationship development with suppliers. However, there appears to be a lack of consensus on the rest of the practices. Moreover, not many research studies attempt to categorize these practices into meaningful categories, which increases the complication in implementing JIT purchasing as well as in researching it. In addition, there is hardly any study that includes the practices reflecting the relationship between the purchasing department and the whole organization, which results in various problems for JIT purchasing implementation.

JIT purchasing is believed to affect firm performance. It increases product quality through improving part quality and speeding up the detection process. Costs decline due to reductions in inventory, cost saving in processing orders and improvement in quality. As a result, productivity also increases. Because of the high level of integration and time saving, lead-time is also expected to be shorter.

Plant size (i.e. classified as large, medium or small) and ownership types (i.e. divided into state-owned, private, and foreign owned) are suspected to influence the implementation of JIT purchasing. They reflect the financial and technological resources available to a firm to adopt managerial improvements. They are also the indicators of the expertise level and the perceived image that a firm possesses, which may facilitate or hinder the adoption of JIT purchasing. Plant size and ownership type also influence the

impact of JIT purchasing on performance. For instance, the same practice may improve performance differently if capacity is taken into account, which allows the larger firm to take advantage of their economies of scale.

Vietnamese manufacturing industry, even though underdeveloped, is growing strongly. That means managers of firms in Vietnam are in need of a better understanding of the operating environment and the appropriate management tools. However, as mentioned above, research on management and for managers on Vietnam is quite limited. In addition, the businesses in Vietnam are not familiar with the concept of cooperating with researchers, thus most studies conducted do not have primary data. Therefore, an empirical study on JIT purchasing, which has been the key to success of Japanese manufacturing and other parts of the world, would be very useful for manufacturing in Vietnam. Especially if the research method can engage managers, it would promise to be practical to managers and academics.

As mentioned above, there exists a good set of practices of JIT purchasing. However, it is not clear how different categories of JIT purchasing practices affect performance. This becomes the main topic of this paper. In addition, it is not sure whether size and ownership type affect the implementation of JIT purchasing or on the effects JIT purchasing has on firm performance. Thus, the examination of these factors will shed light into what type of organization would be more likely to successfully implement JIT purchasing or receive greater benefits from it.

CHAPTER 3

THEORETICAL FRAMEWORK

3.1. Research Objectives

The literature review leads to a conceptual model shown in Figure 8. This model represents the theoretical framework for this study. The study aims at exploring how the practices of JIT purchasing listed in Table 3 affect the firm performance in terms of product quality, costs, productivity and lead-time. It also explores the impact that firm size and ownership type have on the implementation of JIT purchasing and on the relationship between JIT purchasing and firm performance. JIT purchasing practices are categorized as operational, supplier-buyer relationship development, and organizational practices. These dependent and independent variables are explained below in detail.

3.2. Measuring Firm Performance

Firm performance is measured in four dimensions: quality, costs, productivity and lead-time. All of these are measured by the respondent's perception of their firm performance considering the specific definition of the dimensions. The information or data that respondents are requested to base their answers on are explained below.

Given the context of this study, the product quality mainly refers to the conformance dimension, which is the direct result of production. Within the factory, conformance is usually measured by the incidents of defects, which is the proportion of all units that fail to meet specifications, thereby require rework or repair. In the field, it is

commonly measured by the incidence of service calls for a product and the frequency of repairs under warranty (Garvin 1984).

Cost refers to the average total cost per unit. It is measured by total costs over total production units. To isolate the effect that initial investment to implement JIT purchasing incurred, firms having JIT purchasing programs are required to evaluate costs with the depreciation of investment on implementing JIT purchasing. Productivity generally reflects how much of input is needed to produce a certain amount of output. Manufacturers usually measure productivity using the rate of input (including capital and labor) over output.

Lead-time indicates the amount of time that a manufacturer needs to fulfill an order. It begins from the time the order is placed and ends when it is delivered to customers. Lead-time is usually measured in terms of days.

3.3. Size and Ownership Type

Size

There are different measures of firm size, but in this paper, firm size is measured by the number of workers in a specific plant. It is believed that the information on the number of workers is capable of reflecting both the financial and human resources of the firms. It is also easier to collect since it is rarely considered an type of confidential information.

Ownership

There are three types of ownership type: state-owned enterprises (locally and centrally), private (including limited partnership and corporate), and foreign (including joint ventures, wholly-owned subsidiaries, and foreign invested). Ownership type of a firm is determined based on its registered business information.

3.4. Integrated JIT Purchasing Practices

Similarly to performance, integrated JIT purchasing practices outlined in Table 3 are assessed by the respondent's perception of whether or not their firm implements these practices and to what extent. Following is the meaning of each practice asked. The names of the practices used by firms do not necessarily have to be the same as those in this paper to be considered as JIT purchasing practices. As long as the interpretation of the practices is similar, it should be adequate.

3.4.1. Operational

Integrated product planning and scheduling

The “integrated product planning and scheduling” variable refers to the use of frequent deliveries of small lot sizes, the synchronization between contracting orders and scheduling activities, and the synchronization between deliveries and production requirements. That means respondents are asked to base their judgment on whether their firms emphasize frequent deliveries of small lot size or on stock piling, and how often mismatch between parts/materials orders and scheduling activities, and between parts/materials deliveries and production requirements happens.

Reusable Standard Containers

Refers to the use of standard and reusable containers for parts. Thus, respondents are asked to evaluate whether their firms practice delivering parts in small quantities in standards containers to the workstations, instead of in large quantities. Containers are filled frequently when parts are used up.

Maximizing the commonality of parts

“Maximization of the commonality of parts” refers to the firms’ use of the same parts in different products. This reduces the variety of supplies that a buyer requires, thereby increasing the economies of scales of their suppliers and simplifying the process of delivering parts. Therefore, respondents are asked to estimate what percentage of their parts is used in more than one product to help assessing this variable.

Intense exchange of information concerning costs

This variable is referred to the frequency of exchange and the amount of information exchanged between suppliers and buyers. Respondents are asked to provide their perception on whether their firms and the firms’ suppliers communicate frequently about costs and issues that related to costs, as well as how costs could be reduced by joint effort instead of by simply putting pressure on suppliers.

Minimization of paper work

This variable refers to the reduction in the amount of paperwork and processing time required as a result of JIT purchasing. Respondents are suggested to base their

evaluation on how long it takes to process an order, and whether the paperwork is standardized and easy to use or it must go through the command channel for every order.

Control over transportation means and warehouses

“Control over transportation means and warehouse” refers to firms’ ability to exercise control over the time and mode of transportation of parts as well as the location and capacity of warehouses. Respondents are suggested to use the percentage of parts transported by their own firms’ transportation, by suppliers’ transportation means, or by third parties’ transportation means as the basis of their judgment. If transportation agencies are used, whether they perceive the third parties as accessible and reliable. Similarly, warehouses control is evaluated based on the same method.

Quality improvement and quality inspection

“Quality improvement and inspection” is assessed by the respondent’s perception of whether information on quality is exchanged frequently and intensively, whether part shipments are inspected at the supplier, and whether their suppliers emphasize quality improvement in their own companies.

Supplier involvement in product / process development

“Supplier involvement in product/process development” is measured based on the respondent perception of continuous exchange of information concerning products / processes, meaning whether suppliers are willing to get involved with the product/process development of buyers. This variable is also evaluated based on the frequency of plant

visits, and the utilization of liaisons between suppliers and buyers to ensure the flow of information.

3.4.2. Supplier-buyer Relationship Development

Maintaining a very small number of suppliers

This variable refers to the use of very small number of suppliers for each part. Some researches suggest using sole sourcing, yet it involves too great risks. Thus, the literature on JIT purchasing generally supports keeping a small base of suppliers instead of sole sourcing. This variable is assessed by the respondent perception on whether their companies practice using a small number of suppliers for each part or discourage this policy. To be more specific, they are also asked if their firms use sole sourcing.

Supplier selection and evaluation

“Supplier selection and evaluation” refers to whether manufacturers have explicit criteria to select and evaluate their suppliers and what the criteria are in order of importance. The criteria may include quality (of service/product), availability of technical support, costs, reliability, geographical proximity, and willingness to get involved with the buyers. This variable is assessed based on the respondent’s perception of whether their company has formal selection and evaluation criteria and what those criteria are.

Supplier assistance and training

This variable refers to the willingness of buyers to provide assistance to suppliers and to what extent. Forms of assistance include training, technical and financial support,

collaboration to solve problems on suppliers' side and to assist them in the effort of reducing costs and improving quality of supplies. This ensures that JIT implementation does not imply transfer costs from buyers to suppliers. This variable is assessed using the respondent perception about their firms' emphasis on assisting suppliers, the types of assistance, and the frequency of doing so.

Supplier incentives

Supplier incentives refer to methods utilized by buyers to ensure supplier commitment to a long-term relationship and to encourage suppliers to provide the same level of commitment. One of the methods is long-term contractual agreement with allowance for adjustment. Such allowance allows suppliers freedom to modify their operations as long as they meet the buyers' specifications. Other methods can be limited competitive bidding or even no annual bidding for satisfying suppliers, or both formal and informal emphasis on building trust and lasting relationship. Respondents are asked to provide their assessment on whether their firms utilize these incentives to their employees. They are encouraged to provide other types of incentives used by their firms.

Encouragement to implement JIT purchasing in the suppliers' organizations

To take full advantage of JIT purchasing and avoid the risk of shifting costs from buyers to suppliers, suppliers are encouraged to extend JIT purchasing implementation to their own suppliers. Therefore, this variable is measured by the respondent perception on whether their own firms encourage their suppliers to practice JIT purchasing and how strong is the encouragement.

Supplier organizational integration

“Supplier organizational integration” practice intends to involve all functions of both buying and selling organizations into developing a long-term relationship. Some studies even go so far as to explain that a Japanese style supplier-buyer relationship may even include career paths between firms (Dyer and Ouchi 1993). Therefore, respondents are asked what their perception of the supplier organization is, specifically, whether their organization is doing this and to what extent.

3.4.3. Organizational

Information sharing

Purchasing agents must recognize the importance of maintaining a continuous communication link with other departments such as design, production, and marketing within their own organization. JIT purchasing requires intensive information sharing among functions to ensure orders are precise and on time as well as potential problems are handled immediately. This variable is measured by the perception of the respondent on the extension of information between the purchasing department and other departments in the same organization.

Cross-functional cooperation and teams

It is shown that the lack of organizational support is a main source of problems for JIT purchasing implementation. Therefore, it is important to ensure that manufacturers stress crucial concepts such as emphasizing cross-functional cooperation or organizing cross-functional teams to implement JIT purchasing. This is assessed by

respondent perception on whether their firms are emphasizing such cooperation to implement their purchasing programs.

Matching strategies

This refers to whether JIT purchasing strategy will fit into the overall strategy of the organization. Even though it is believed that JIT purchasing benefits any organization regardless of their nature and circumstances, JIT purchasing may not be the best choice if the types of parts needed must be imported or are so rare that low inventory levels mean extremely high risk. Therefore, respondents are asked whether they think their purchasing strategy fits with their manufacturing and overall strategies.

Management's commitment and support

“Management's commitment and support” is a critical factor since the lack of it proves to cause serious problems. This variable is assessed by respondent perception about the level of commitment their managers show to the implementation of the purchasing strategy in their organizations.

Figure 8 presents the model proposed to study in this paper. The integrated set of JIT purchasing practices are expected to influence firm performance directly. Firm size and ownership types are suggested to affect the implementation of JIT purchasing. At the same time, they are also believed to be able to affect the impacts that JIT purchasing results on firm performance.

Figure 8: Theoretical Model

3.5. Hypotheses

H1: The larger the firm is, the more it implements JIT purchasing

H2: Different types of ownership affect the likelihood of implementing JIT purchasing. Specifically, the foreign subsidiaries or joint ventures tend to have the highest likelihood of implementing JIT purchasing, and the state-owned enterprises tend to have an average likelihood of implementing JIT purchasing. Private owned firm tend to have lowest likelihood of implementing JIT purchasing.

H3: High-JIT purchasing companies have better firm performance than low-JIT purchasing companies. Specifically,

H3a: High-JIT purchasing companies have higher product quality than low-JIT purchasing companies.

H3b: High-JIT purchasing companies have lower costs than low-JIT purchasing companies.

H3c: High-JIT purchasing companies have higher productivity than low-JIT purchasing companies.

H3d: High-JIT purchasing companies have shorter lead-time than low-JIT purchasing companies.

H4: The larger the company, the stronger the effect of JIT purchasing on the firm performance

H5: The ownership type of a company influences the effect of JIT purchasing on the firm performance. Specifically, in a foreign-owned company, the effect of JIT purchasing on firm performance is stronger than in a state-owned enterprise or a private company.

CHAPTER 4

METHODOLOGY

This chapter presents the methodology employed in this study. First, the framework of sampling design is explained in terms of population, sampling frame, and sampling size and selection. Second, research design is described. Third, the description of the data collection method is given. Finally, the procedures for conducting data analysis are discussed.

4.1. Sampling Design

Population

The population studied was manufacturing companies in Vietnam. Table 6 shows the number of total industrial firms in Vietnam based on World Bank Statistics. Specific industries were not chosen for this study due to the difficulty of ensuring that a sufficient number of manufacturing companies in the same industries would participate in the data collecting process.

Table 6 : Number of Industrial Enterprises by Ownership Type

	1995	1996	1997	1998	1999
Total	615,374	626,129	617,805	592,948	618,198
State owned	1,958	1,879	1,843	1,821	1,786
Private	612,977	623,710	615,296	590,246	615,453
Foreign owned	439	540	666	881	959

Sources: World Bank, General Statistical Office, Statistical Yearbook 2000

The respondent units were senior executives of the companies such as general managers, directors, production managers, and purchasing managers, who were familiar with the purchasing procedures of their organizations. The unit of analysis was the manufacturing companies.

Sampling Frame

The preliminary sampling frame population was derived from reports of the Board of Planning and Investment, which provided lists of manufacturing companies in Vietnam. The reports also contained information on the industry sector, and ownership type, and registered capital/equity of each company.

Sampling Size and Selection

For this study, Eastern South Vietnam including Ho Chi Minh City was chosen. The region accounts for twenty percent of the population. It is the largest economic, industrial and investment center in Vietnam. There are more than one thousand industrial enterprises, mainly concentrating in Ho Chi Minh City, Binh Duong, and Dong Nai. It was anticipated that the majority of companies in Vietnam were unfamiliar with research activities and unwilling to reveal any internal information regardless of its usefulness or importance. Therefore, this study was forced to use a small sample size of approximately one hundred companies due to limited resources and time. In addition, because of the difficulty of obtaining data in Vietnam, the convenient sampling method was employed mainly based on personal contacts. The key selection criterion was to ensure that the three ownership types were proportionally represented in the sample based on their shares

in the national gross production. According to table 4, public sector contributed approximately forty percent of the national production, private sector twenty five percent and foreign invested thirty-five percent. Therefore, 34 state-owned enterprises, 40 private companies, and 26 foreign invested companies were asked to participate in this study.

4.2. Research Design

Personal and phone interviews were the main method used to gather data for this study. It was felt that the interview method would increase the response rate of this study since it appeared that companies in Vietnam did not have a history of cooperating with academic researchers. In addition, this method allowed for personal interaction between companies and the researcher, which would assure a high level of confidentiality.

Respondents were asked to answer a list of both close-ended and open-ended questions in a structured-questionnaire. Close-ended questions were in regard to the implementation of JIT purchasing practices and firm performance. The open-ended questions were used to explore concerns and opinions of respondents on the topic examined, obstacles in implementing JIT purchasing, solutions to the problems occurring, alternatives to the JIT purchasing approach, as well as their experience with this research. These questions were primarily aimed at exploring the adoption of JIT purchasing in Vietnam and its effects on firm performance.

The questionnaire was pre-tested in three companies to improve the clarity of the questions. The questions were written first in English, and then translated into

Vietnamese. It was back translated into English by a third party to ensure the accuracy of the translation. Since the field of business management in Vietnamese has not adopted terms such as Just-In-Time in Vietnamese, an attempt to translate the questionnaire could expose the study to the risk of misinterpretation. Thus, several terms such as Just-In-Time were kept in English to avoid misunderstanding.

4.3. Data Collection

The companies selected were contacted to explain the objectives of this study and asked for an interview. Once the appointment was set up, the questionnaire was sent several days before the actual interview so the respondents had an opportunity to read the questions and recall all necessary information. Respondents were asked to answer all questions in the questionnaire during the interview so that if there were unfamiliar terms, they could be clarified.

The responses were obtained as follow: 68 out of 100 companies agreed to participate in the study. The reasons for not participating are shown in Table 7. As can be seen, 17% of the companies declined to participate because either they were not familiar with academic research and its implications for their companies or they were not interested in academic research. 11% of the companies contacted agreed to review the questionnaire but kept delaying the interview after a waiting period of one month since the time they received the questionnaire. Therefore, the final response rate is 54%. Of 54 companies that participated in this study, 7 agreed to have personal interviews. 47 interviews were conducted on telephone due to time constraints of the respondents.

Table 7 : The Reasons for not Participating in This Study

Reason	Number of companies
1. Not enough time or personnel to handle the interviews	15
2. Unfamiliar with academic research and unsure how the study may affect their companies	10
3. Not interested in neither the study nor its implications	7
4. Agreed to participate in the study but unable to relate the practices of Just-in-time purchasing to the purchasing practices of their organizations	3
5. Agreed to participate but top managers or the personnel supposed to handle the interviews were not available after a waiting period of one month	11

4.4. Data Analysis

Both quantitative and qualitative data from the research were analyzed. Quantitative analysis focused on determining the effects of JIT purchasing on firm performance, and the impacts of firm size and ownership type. Before MANOVA and ANOVA were conducted, the assumptions of multivariate and univariate analysis including independence of the observations, normality, and homogeneity of variances were examined to ensure the power of the tests (Stevens 1996).

The data analysis was conducted in the following way. Descriptive analysis was carried out to examine the extent of implementation of JIT purchasing practices.

Correlations among the independent variables and among the dependent variables were also investigated to establish if the practices of JIT purchasing were overlapped and if the four dimensions of firm performance were related.

To test hypothesis 1, MANOVA was conducted to compare the extent of implementing JIT purchasing practices among small firm, medium firm, and large firm groups. ANOVA was then used to decide what specific practices were significantly different among the three sizes of firms. Paired-samples T-tests were employed to investigate the differences in implementation of JIT purchasing between each pair of groups. Similar procedures were used to tests hypothesis 2 with three groups of ownership types: state-owned enterprises, private companies, and foreign-invested companies, instead of three group sizes.

Then, Pearson correlation coefficients were used to determine the strength of association between JIT purchasing practices (i.e. the independent variables) and firm performance (i.e. the dependent variables). This analysis serves as a preliminary evaluation of the effects of JIT purchasing on firm performance. To test hypothesis 3, clustering analysis was used to categorize the firms into two groups: high-JIT purchasing and low-JIT purchasing groups. MANOVA was conducted to compare these two groups in terms of performance. The test helped to determine if firm performance between high-JIT purchasing and low-JIT purchasing firms was significantly different. In other words, it helped to answer if JIT purchasing affects firm performance. Then, ANOVA was employed for each of the performance dimensions (i.e. the dependent variables) in order

to find out what dimensions were significantly different between high JIT purchasing group and low JIT purchasing group of companies.

To test hypotheses 4 and 5, only the high-JIT purchasing group was selected. Then MANOVA technique was used to find out if firm performance differed for the three groups of small, medium, and large size firms; or three groups of state-owned, private, and foreign-invested companies. These tests answered whether firm size and ownership types affect the impact of JIT purchasing on performance. Again, ANOVA was used to find out what performance dimensions are significantly different among the three groups.

Qualitative data gathered in the interviews were used to support the statistical results. They were also used to explain the unexpected results of the analysis. In addition, the information was also useful in deriving recommendations.

Since some variables were constructed from more than 1 answer, the responses for these variables were the average of the responses of the questions making up each variable. Following is the list of the abbreviations of the variables presenting in the study, the question number in the questionnaire responding to these variables, and the formulas to calculate the value of the variables if they were answered by more than one question (Table 8).

Table 8 : List of Variables Relating to the Question# in the Questionnaire

Variable	Description of the variable and its measurement	Question #
Company Background		
TYPE	The ownership type of the company, could be one of three types: state-owned, private, foreign-invested	6
SIZE	Firm size, determined by the number of employees (small if less than 100 employees, medium if between 100 and 300 employees, larger if more than 300 employees)	7
Independent Variables		
<u>Operational Practices</u>		
INTEGRAT	The level of integration between product planning and scheduling and frequent deliveries of parts/materials, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)	8-10
	$INTEGRAT = \frac{(Q\#8) + (Q\#9) + (Q\#10)}{3}$	
PACKAGE	The use of standard, reusable containers for parts during the production process, in rating scale (1 – strongly disagree, to 5 – strongly agree)	11
MAXIMIZE	The maximization of the commonality of parts for different products, in rating scale (1 – strongly disagree, to 5 – strongly agree)	12
COSTINFO	The intensity of exchanging information, in terms of frequency and amount, concerning costs between the company and their suppliers, in rating scale (1 – strongly disagree, to 5 – strongly agree)	13

Continued

Variable	Description of the variable and its measurement	Question #
MINIMIZE	The reduction in the amount of paperwork and processing time for the purchasing department of the company, in rating scale (1 – strongly disagree, to 5 – strongly agree)	14
CONTROL	The company's ability to exercise control over the mode of transportation and the time of transporting as well as the location and capacity of the warehouses for parts purchased, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)	15-16
	$CONTROL = \frac{(Q\#15) + (Q\#16)}{2}$	
QUALITY	The ability to ensure quality of parts/materials as well as to improve their quality continuously, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)	17-19
	$QUALITY = \frac{(Q\#17) + (Q\#18) + (Q\#19)}{3}$	
INVOLVE	The level of supplier involvement in the product/process development of the buyers, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)	20-24
	$INVOLVE = \frac{.5(Q\#20 + Q\#21) + (Q\#12) + .5(Q\#23 + Q\#24)}{3}$	
<u>Supplier-buyer Relationship Development Practices</u>		
<u>SUPPNUM</u>	The emphasis on maintaining a small base of suppliers or even employing sole supplier for each kind of parts/materials purchased, in rating scale (1 – strongly disagree, to 5 – strongly agree). Either the response from Q#25 or Q#26 is chosen wherever the answer is greater than 1.	25 or 26

Continued

Variable	Description of the variable and its measurement	Question #
SUPPLIER	<p>The use of formal criteria to select new suppliers and to evaluate current suppliers, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)</p> $CONTROL = \frac{(Q\#27) + (Q\#29)}{2}$	27,29
SUPPORT	<p>The level of assistance, technical and financial support provided by the buyers to the suppliers, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)</p> $SUPPORT = \frac{.5(Q\#31 + Q\#32) + .5(Q\#33 + Q\#34) + (Q\#35)}{3}$	31-35
INCENTIV	<p>The use of different methods by buyers to reflect their commitment to a commitment to a long-term relationship with their suppliers and to encourage their suppliers to provide the same level of commitment, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)</p> $INCENTIV = \frac{.5(Q\#37 + Q\#38) + (Q\#39) + .5(Q\#40 + Q\#41)}{3}$	37-41
EXTEND	<p>The level of encouragement that the buyers demonstrate to encourage their suppliers to practice JIT purchasing with their own suppliers, in rating scale (1 – strongly disagree, to 5 – strongly agree)</p>	43
ORGANIZE	<p>The level of emphasizing all functions of both buying and selling companies into developing a long-term relationship between the two organizations, in rating scale (1 – strongly disagree, to 5 – strongly agree)</p>	44

Continued

Variable	Description of the variable and its measurement	Question #
<u>Organizational Practices</u>		
SHAREINF	The intensity of sharing information among the departments within the purchasing organization, in rating scale (1 – strongly disagree, to 5 – strongly agree)	45
CROSSFUN	The level of cooperation among all functions within the purchasing organization, in multi-item scale. The rate of scale (1 – strongly disagree, to 5 – strongly agree)	46-47
	$CROSSFUN = \frac{(Q\#46) + (Q\#47)}{2}$	
STRATEGY	The level of harmonizing between the purchasing strategy and the overall strategy of an organization, in rating scale (1 – strongly disagree, to 5 – strongly agree)	48
MANAGER	The level of support and commitment of top managers to the purchasing strategy employed by their organization, in rating scale (1 – strongly disagree, to 5 – strongly agree)	49
<u>Dependent Variables</u>		
PROQUALI	The non-defect rate or defect rate compared to those of other companies in the same industry, in multi-item scale. The rate of scale (non-defect 1 – lower than the industry average, to 5 – best/highest in the industry; defect: 1 – higher than the industry average, to 5 – best/lowest in the industry)	50-51
	$PROQUALI = \frac{(Q\#50) + (Q\#51)}{2}$	

Continued

Variable	Description of the variable and its measurement	Question #
COSTS	The total costs per unit compared to that of other companies in the same industry, in rating scale (1 – higher than the industry average, to 5 – best/lowest in the industry)	52
PRODUCTI	The total factory productivity (i.e. the ratio of total output to the sum of associated labor and capital) compared to that of other firms in the industry, in rating scale (1 – lower than the industry average, to 5 – best/highest in the industry)	53
LEADTIME	The necessary time to deliver an order from the time the order was placed to the time it was delivered, in rating scale (1 - longer than the industry average, to 5 – best/shortest in the industry)	54

Note:

1. The responses to question# 27a - 27d, 29a - 29c were not used to measure the SUPPLIER variable. They were used to determine the specific selection and evaluation criteria of those manufacturing companies that do have formal supplier selection and evaluation policies.

2. Question# 1-5, 28, 30, 36, and 42 were used for qualitative analysis

CHAPTER 5

RESULTS

This chapter presents the results of the data analysis. Section one describes the general profiles of participating companies. Section two presents a descriptive analysis of the variables. Then the results of the quantitative analysis are examined. Next, some characteristics of the industries participating in the study are analyzed. Finally, the results of this study are compared with the literature's findings in the summary section.

5.1. Firm Profiles

As discussed in section 4.3, 100 manufacturing firms were targeted. 54 of them responded to the questionnaire. Table 9 shows the respondent firms in terms of size and ownership type. All state-owned enterprises and the majority of foreign-invested companies are large. Meanwhile, private companies are split evenly into three firm sizes.

Table 9 : Respondent Firms in terms of Firm Size and Ownership Type

		Ownership Type			
		State-owned	Private	Foreign	Total
Firm Size	Small	0	6	0	6
	Medium	0	6	1	7
	Large	18	6	17	41
	Total	18	18	18	54

The large size of the state-owned enterprises can be explained by the fact that most of these companies have been in business for more than twenty years and received a continuous stream of investments from the government over the years. In addition, it is much easier for the state-owned enterprises to obtain a loan, which provides them with the necessary capital to expand, than for firms in the private sector. Furthermore, the governmental firms are highly hierarchical organizations with a fairly formal internal structure. They also have a great deal of complex relationships with other state-owned enterprises in the same industry and with different organizations within the government. These factors result in a large number of personnel required in a state-owned enterprise.

In the case of the foreign-invested companies, their large size is mainly the result of the labor-intensive industries they are operating in. Moreover, a large number of these foreign-invested companies are subsidiaries of large international companies or joint ventures between a state-owned enterprise and a multinational company. That means they possibly have large financial resources to expand quickly, especially in a country like Vietnam where expansion costs are relatively low.

Meanwhile, private companies are hardly provided with any source of governmental or foreign investments. They are also at a disadvantage when seeking bank investments or loans due to their high risk. As a result, they are unlikely to have a large source of capital to expand. In addition, the owners of private companies also hesitate to risk their personal investments into the firms in such a fast changing operating environment like in Vietnam.

Table 10 : Respondent Firm Profiles by Industries

Characteristics	Industrial category						
	Food/ Beverage	Footwear	Textile/ Garments/ Accessories	Paper	Packaging (carton boxes)	Automobile	Personal care
Firm's Sample	15	6	10	4	3	7	2
Firm's location							
Ho Chi Minh City	10	6	6	4	3	-	-
Southern provinces	5	-	4	-	-	7	2
Firm Size							
Small	1	-	-	2	3	-	-
Medium	1	1	2	-	-	-	-
Large	13	5	8	2	-	7	2
Ownership Type							
State-owned	5	3	5	1	-	-	-
Private	4	3	2	3	3	-	-
Foreign-invested	6	-	3	-	-	7	2
Markets served							
Domestic	13	2	-	4	3	7	2
Foreign	1	2	3	-	-	-	-
Both	1	2	7	-	-	-	-
Average percentage of parts/materials purchased from local suppliers or imported from foreign suppliers							
Local	30%	10%	30%	50%	60%	5%	20%
Imported	70%	90%	70%	50%	40%	95%	80%

Continued

Characteristics	Industrial category						
	Industrial chemicals	Tobacco	Electronic equipments	Plastic products	Handcraft	Porcelains	School/office supplies
Firm's Sample	1	1	1	1	1	1	1
Firm's location							
Ho Chi Minh City	1	1	-	1	-	-	1
Southern provinces	-	-	1	-	1	1	-
Firm Size							
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	1	-	1
Large	1	1	1	1	-	1	-
Ownership Type							
State-owned	1	1	1	1	-	-	-
Private	-	-	-	-	1	1	1
Foreign-invested	-	-	-	-	-	-	-
Market served							
Domestic	1	1	1	1	-	-	1
Foreign	-	-	-	-	-	-	-
Both	-	-	-	-	1	1	-
Average percentage of parts/materials purchased from local suppliers or imported from foreign suppliers							
Local	10%	90%	20%	15%	95%	85%	30%
Imported	90%	10%	80%	85%	5%	25%	70%

Table 10 describes several characteristics of the 54 respondent firms, belonging to fourteen industries in this study. “Markets served” refers to the consumer base of the products of the respondents. As can be seen, most of the manufacturing companies sell their products in the domestic markets. Therefore, when evaluating their performance, the respondents were asked to compare themselves with other companies located in Vietnam in the same industries. The last characteristic in Table 10 reveals the origins of the parts/materials purchased by the companies in the sample. It shows that the majority of supplies are purchased from foreign suppliers. This is an important factor that later explains the purchasing practices employed by a large number of firms in this study.

5.2. Descriptive Analysis

5.2.1. Analysis of Means

The analysis of the means of the independent variables (i.e. the practices of JIT purchasing) reveals a general picture of the extent of adoption of JIT purchasing among the respondent firms (Figure 9). On the 5-point scale used, the value of 1 is considered not implemented and 5 fully implemented. Several observations are notable. First, no company emphasizes on encouraging their suppliers to practice JIT purchasing with their own suppliers ($\mu_{\text{EXTENDJI}} = 1.000$). Therefore, the variable EXTENDJI will be deleted in further analysis, except in cluster analysis.

Second, variable CROSSFUN ($\mu_{\text{CROSSFUN}} = 2.0556$), which is comprised of the two components: cooperation among departments and the use of cross-functional teams in implementing purchasing strategies is hardly implemented. It is observed that firms

indeed encourage cooperation among all the departments within their organizations to implement their current purchasing strategies. However, none of them employs cross-functional teams. Most of the respondents indicate that they were not aware of this concept and the closest form to cross-functional teams they had was frequent meeting of representatives from different departments. The representatives are not necessarily the same from one meeting to another.

Figure 9 : Means the Independent Variables (JIT Purchasing Practices)

Descriptive Statistics								
	N	Range	Minimum	Maximum	Mean		Std.	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
INTEGRAT	54	1.67	3.00	4.67	3.7037	4.718E-02	.3467	.120
PACKAGE	54	4.00	1.00	5.00	2.0741	.1790	1.3154	1.730
MAXIMIZE	54	4.00	1.00	5.00	4.3333	.1586	1.1655	1.358
COSTINFO	54	4.00	1.00	5.00	2.4630	.1901	1.3969	1.951
MINIMIZE	54	2.00	3.00	5.00	3.2407	6.962E-02	.5116	.262
CONTROL	54	3.00	2.00	5.00	3.1389	9.005E-02	.6617	.438
QUALITY	54	3.33	1.33	4.67	2.1049	.1000	.7349	.540
INVOLVE	54	2.67	1.17	3.83	2.0340	6.158E-02	.4525	.205
SUPPNUM	54	4.00	1.00	5.00	3.2407	.1585	1.1645	1.356
SUPPLIER	54	3.00	1.00	4.00	2.2315	9.596E-02	.7052	.497
SUPPORT	54	2.83	1.00	3.83	1.3889	7.857E-02	.5774	.333
INCENTIV	54	3.67	1.17	4.83	3.0093	.1139	.8370	.701
EXTENDJI	54	.00	1.00	1.00	1.0000	.0000	.0000	.000
ORGANIZE	54	3.00	1.00	4.00	2.8333	.1114	.8184	.670
SHAREINF	54	3.00	2.00	5.00	3.7778	.1415	1.0401	1.082
CROSSFUN	54	2.50	1.50	4.00	2.0556	6.826E-02	.5016	.252
STRATEGY	54	3.00	2.00	5.00	3.7407	7.086E-02	.5207	.271
MANAGERS	54	3.00	2.00	5.00	4.0370	9.518E-02	.6994	.489
PROQUALI	54	4.00	1.00	5.00	2.9074	.1651	1.2134	1.472
COSTS	54	3.00	1.00	4.00	2.1667	.1145	.8412	.708
PRODUCTI	54	3.00	1.00	4.00	2.3148	.1052	.7727	.597
LEADTIME	54	3.00	2.00	5.00	2.6667	.1152	.8467	.717
Valid N (listwise)	54							

A review of the variable means also shows that these manufacturing companies hardly provide any assistance or support (i.e. technical and financial) to their suppliers ($\mu_{\text{SUPPORT}} = 1.3889$). The origins of the supplies are probably able to offer an explanation

to this observation. As shown in Table 10, the majority of the supplies purchased by the respondent firms are from foreign suppliers. Thus, it was most likely that the suppliers in this case have better technical as well as financial resources than their buyers. In addition, the geographical distance is a major obstacle in building strong collaboration between suppliers and buyers.

The supply origins also explain the extent of implementing the INTEGRAT practice (i.e. integration between product planning & scheduling and frequent deliveries of parts/materials). INTEGRAT ($\mu_{\text{INTEGRAT}} = 3.7037$) is comprised of three sub-practices: frequent deliveries of small lot sizes, synchronization between ordering and production activities, and synchronization between deliveries and production requirements. A closer look at these components reveals that while most firms are successful in synchronizing the ordering activities of the purchasing department with the production activities, they are not able to practice frequent deliveries of small lot sizes and to synchronize deliveries with production requirements.

Importing the majority of the parts/materials makes it costly for firms to have frequent deliveries in small lot sizes. Transportation costs, customs fees, and the risk of running out of stock in the middle of the process do not allow firms to consider this practice. Geographical distance intensifies the difficulty in delivering parts/materials according to the production schedules. Finally, this implies that companies have the tendency to keep a certain level of safety inventories to be assured that they could meet their customers' demands at any point in time.

The QUALITY variable ($\mu_{\text{QUALITY}} = 2.1049$) refers to the firms' effort to ensure part/material quality and to continuously improve part/material quality. It was observed that most firms frequently exchange information concerning part/material quality with their suppliers. Usually, quality standards were discussed before the orders are placed. If the parts/materials delivered do not meet those standards, the firms would contact the suppliers immediately to inform about the problems and to seek for a solution as quickly as possible. Most of the respondents specify that they do not require their suppliers to inspect parts/materials before shipping because they assume that it is the suppliers' obligation to do so in order to guarantee their quality standards. Finally, almost none of the companies show any encouragement of their suppliers' efforts to improve product quality. One of the main reasons, as explained above, is that these suppliers are larger multinational corporations in most cases. Thus it is presumed that the respondent firms are not in the position to provide any significant contributions to their suppliers' operations except to notify them if and when a problem occurs. Furthermore, the participants in this study also put in plain words that improving part/material quality is simply the suppliers' responsibility. As a buyer, they are most likely to switch to other suppliers if there is a better quality and cheaper source of supplies in the market.

With that mentality, it is no surprise to find that these firms do not emphasize keeping a small base of suppliers ($\mu_{\text{SUPPNUM}} = 3.2407$). Most of the companies confirm that they prefer to place their orders of one type of part/material to one supplier at a time to ensure the quality consistency throughout the batch. However, they definitely consider different suppliers from order to order to attain the optimal part/material quality and

prices. As a result, a firm may have to evaluate and select suppliers fairly frequently. Hence, these companies tend to have informal criteria and fast procedures to select and evaluate suppliers ($\mu_{\text{SUPPLIER}} = 2.2315$).

Of 54 companies participating in the study, 46 companies have some form of supplier selection and evaluation criteria (Table 11). The rest of the companies, mainly joint ventures, are tied in the contract to purchase supplies from the sources selected by their parent companies. It appears that prices and quality are the most important criteria used ($\mu_{\text{SELQUAL}} = 4.6957$; $\mu_{\text{SELPRICE}} = 4.6522$; $\mu_{\text{EVAQUAL}} = 4.7609$; $\mu_{\text{EVAPRICE}} = 4.6304$).

Geographical distance is not a factor in selecting suppliers ($\mu_{\text{SELDIST}} = 1.4348$). Similarly, suppliers' willingness to be involved in the operations of the purchasing firms is not considered important in either selecting suppliers or evaluating them ($\mu_{\text{SELHELP}} = 1.1522$; $\mu_{\text{EVAHELP}} = 1.1304$). The specific selection and evaluation criteria employed by specific industries will be described later when industry analysis is presented.

Table 11 : Means of Supplier Selection and Evaluation Criteria

	Minimum	Maximum	Mean	Std.	Variance
SELQUAL	3.00	5.00	4.6957	.5914	.350
SELPRICE	2.00	5.00	4.6522	.8490	.721
SELDIST	1.00	4.00	1.4348	.7499	.562
SELHELP	1.00	4.00	1.1522	.5150	.265
EVAQUAL	4.00	5.00	4.7609	.4313	.186
EVAPRICE	2.00	5.00	4.6304	.8527	.727
EVAHELP	1.00	4.00	1.1304	.4993	.249

Since companies did not stress the willingness of suppliers to get involved, it is reasonable to have a relatively low level of adoption of INVOLVE ($\mu_{\text{INVOLVE}} = 2.0340$). The companies limit the extent of suppliers' involvement to plant visits and assigning specific liaisons to manage the flow of information with specific suppliers. A few companies pay a little attention to encouraging their suppliers to have specific liaisons assigned to manage the relationship with them. However, the majority of the companies do not consider it is important. The main reason is that the suppliers are either resourceful enough to implement that particular practice already or too small to be able to do so. Finally, very few companies share the information related to new product/process development with their suppliers or encourage their suppliers to get involved in the development process. It is partly because most of these companies are manufacturing with little R&D to share and partly because they are not accustomed to share sensitive information with their suppliers.

The reason for the relatively low level of implementation of the PACKAGE (i.e. the use of reusable standard containers to hold parts during the production process) practice ($\mu_{\text{PRACTICE}} = 2.0741$) will be clarified once the industries are analyzed later in the study. Essentially, it is an industry specific practice that is not applicable for all plants. Next, the practice of sharing information related to cost ($\mu_{\text{COSTINFO}} = 2.4630$) is not implemented widely. In short, all the respondent firms are aware of the practices of JIT purchasing. Thus they themselves recognize that they are not implementing these supposed benefits to their full extent. However, most of the respondents reveal that they believe in their overall strategies and their top managers support the purchasing strategies

currently employed in their organizations ($\mu_{\text{STRATEGY}} = 3.7407$; $\mu_{\text{MANAGERS}} = 4.0370$). Notice that when a firm responds that their competing/manufacturing and their top managers support their purchasing strategy, that this purchasing strategy is not necessarily the best practice or suitable for all companies. They simply express that given their industry characteristics and resources, that is the best purchasing strategy that they could implement.

5.2.2. Correlation Analysis

Correlations among the independent variables (i.e. JIT purchasing practices) are also examined to check for multicollinearity (Appendix A). Some moderately significant correlations among the independent variables include the correlations between INTEGRAT and MINIMIZE (0.347 at $p < 0.01$), between COSTINFO and STRATEGY (0.273 at $p < 0.05$), and between COSTINFO and MANAGERS (-0.385 at $p < 0.01$). It is possible to rationalize that the higher the level of synchronization among the ordering, production activities, and deliveries is (INTEGRAT), the simpler the purchasing process is (MINIMIZE). Therefore, these two variables are positively correlated. However, since they both have significant impact on an organization, they are kept in the study. The significant negative correlation between the practice of sharing information concerning costs (COSTINFO) and supporting purchasing strategies from the overall strategies and managers is understandable once the data set is examined. It is showed that most private companies feel that their competitive strategies and top managers support the purchasing strategies currently employed. Thus the private companies score higher on the level of implementation of strategy and management support. However, these same companies,

since they are private, greatly hesitate in sharing information concerning costs with their suppliers for fear that such sensitive information may be used inappropriately. In that case, with their limited resources, they are not able to attract their suppliers or to defend themselves against larger firms in the same industry.

Some significant strong correlations are also found. They are the correlations between PACKAGE and MAXIMIZE (0.414 at $p < 0.01$), PACKAGE and COSTINFO (0.566 at $p < 0.01$), PACKAGE and SUPPNUM (0.407 at $p < 0.01$), PACKAGE and SUPPLIER (-0.405 at $p < 0.01$), MAXIMIZE and SUPPNUM (0.679 at $p < 0.01$), COSTINFO and QUALITY (0.601 at $p < 0.01$), COSTINFO and INVOLVE (0.651 at $p < 0.01$), COSTINFO and SUPPNUM (0.638 at $p < 0.01$), and between COSTINFO and SUPPLIER (-0.580 at $p < 0.01$). A closer look at the cases explains these correlations. The number of car-manufacturing companies is relatively large in this sample (7 out of 54 companies). The automobile industry is the only one that is most likely to utilize the practices of using standard containers to hold parts during the production process (PACKAGE), maximizing the commonality of parts (MAXIMIZE).

In addition, their purchasing structure is quite distinct in that they have to purchase parts from suppliers chosen by their parent companies, which most of the time are other subsidiaries of the same companies. Therefore, they are more likely to share information concerning costs with their suppliers (COSTINFO), keep a very small base of suppliers for each part (SUPPNUM), exchange information concerning quality and collaborate to improve part quality with their suppliers (QUALITY), and emphasize

supplier involvement in their operations. Therefore, all of these practices are adopted at a higher level for this group of firms. In other words, these practices are highly correlated. In the case of supplier selection and evaluation practices, these companies do not have the authority to do so, thus creating a strong negative correlation with other practices in place. Since these significant correlations are caused by one specific industry, it is not typical for all manufacturing companies in Vietnam. Thus they are kept for further analysis.

Table 12 : Correlation Matrix among Dependent Variables

		PROQUALI	COSTS	PRODUCTI	LEADTIME
PROQUALI	Pearson Correlation Sig. (2-tailed)	1.000			
COSTS	Pearson Correlation Sig. (2-tailed)	.006 .965	1.000		
PRODUCTI	Pearson Correlation Sig. (2-tailed)	.082 .556	.760 .000*	1.000	
LEADTIME	Pearson Correlation Sig. (2-tailed)	.162 .241	.318 .019*	.250 .068	1.000

Correlations among the dependent variables (i.e. firm performance) are reviewed to determine whether the four performance dimensions are overlapped. Table 12 presents the correlation matrix among these dependent variables. An examination of the correlations reveals a strong relationship between costs and productivity (significant at the 99% level). This is expected, as these two performance dimensions are very similar in the way they are measured. However, both of these variables are kept in further analysis

since the literature proves support to the improvement of both of these measurements under JIT purchasing. Lead-time and costs are also positively correlated (significant at the 95%). It is most likely that better part quality cut down on lead-time as well as costs.

5.3. The Effects of Firm Size and Ownership Type on JIT Purchasing Adoption

This analysis is aimed at testing the first two hypotheses: the size and the ownership type of firms affect the adoption level of JIT purchasing. Multivariate analysis technique is used to compare the three groups of firms, divided based on either their size or ownership type, in terms of JIT purchasing practices. Then, univariate analysis is conducted to clarify what specific practices are significantly different among the three groups. Finally, paired-sample T-tests are employed to find out how each pair of groups differs in terms of JIT purchasing practices implemented.

5.3.1. The Effect of Firm Size

The MANOVA results indicate that the three groups of firms divided based on their sizes are significantly different in terms of practices adopted. The results of different tests are presented in Table 13. All tests (Pillai's Trace $p = 0.024 < 0.05$; Wilks' Lambda $p = 0.005 < 0.01$; Hotelling's Trace $p = 0.001 < 0.01$; and Roy's Largest Root $p = 0.000 < 0.01$) yield significant results at the 95% significant level. Therefore Hypothesis 1 is confirmed. Firm size affects the level of implementation of JIT purchasing. Next, ANOVA tests are conducted to find out what particular practices make these groups differ. To reduce the Bonferroni alpha, ANOVA tests will be conducted at alpha level of 1%.

Table 13 : MANOVA Tests for Firm Groups Divided Based on Size

Multivariate Tests ^d								
Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power ^a
Intercept	Pillai's Trace	.993	288.368 ^b	17.000	35.000	.000	4902.261	1.000
	Wilks' Lambda	.007	288.368 ^b	17.000	35.000	.000	4902.261	1.000
	Hotelling's Trace	140.065	288.368 ^b	17.000	35.000	.000	4902.261	1.000
	Roy's Largest Root	140.065	288.368 ^b	17.000	35.000	.000	4902.261	1.000
SIZE	Pillai's Trace	.906	1.752	34.000	72.000	.024	59.578	.983
	Wilks' Lambda	.246	2.090 ^b	34.000	70.000	.005	71.051	.995
	Hotelling's Trace	2.444	2.444	34.000	68.000	.001	83.081	.999
	Roy's Largest Root	2.158	4.569 ^c	17.000	36.000	.000	77.679	1.000

a. Computed using alpha = .05

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

d. Design: Intercept+SIZE

ANOVA analysis points out the specific variables that make these groups differ. Results of the tests are presented in Figure 10 (Appendix B). These variables are MINIMIZE ($p = 0.019 < 0.01$), INVOLVE ($p = 0.000 < 0.01$), ORGANIZE ($p = 0.007 < 0.01$), SHAREINF ($p = 0.000 < 0.01$), and MANAGERS ($p = 0.001 < 0.01$). Thus the three groups of firms divided based on size are significantly different in terms of the above variables at the 99% significant level. In other words, the three groups of firms differ in their effort to reduce paperwork for the purchasing department, in encouraging their suppliers to be involved in new product/process development, in emphasizing the development of long-term relationship with suppliers, in sharing information within their organizations, and in the level of support received from top management. If the 95% significant level were used, the following variables COSTINFO ($p = 0.013 < 0.05$), QUALITY ($p = 0.025 < 0.05$), and SUPPNUM ($p = 0.052$) can also be considered significant among the three groups of firms. ANOVA tests again confirm that the level of implementation of certain practices differs across the groups.

The assumptions of multivariate and univariate analysis are also examined. First, the assumption of independence of observations is warranted since the responses of each participating firm are independent from those of another. Second, the normality of data is tested. The test results are presented in Figure 11 (Appendix B). Histograms, skewness, and kurtosis for each variable are also examined to test for normality of distribution. The results indicate that there is a non-normal distribution for several variables. However the sample size is too small to perform any significant transformations. Therefore, power of the tests may be affected. Tests of homogeneity of variances (Figure 12, Appendix B) indicate that generalized variances are homogeneous in most cases. However, in the cases that variances are non-homogeneous, power may be affected severely as the size of each group is unequal (small size group: 6, medium size group: 7, and large size group 41).

Paired-sample T-tests for each pair of groups reveal how these groups differ from each other. The tests between small size firms and medium size firms show that the two groups significantly differ in terms of implementing PACKAGE practice (Figure 14, Appendix B). PACKAGE ($p = 0.048$) is significant at the 95% level. An examination of the variable means indicates that medium size firms have a higher level of implementing PACKAGE than small firms (Figure 13, Appendix B). Thus, it may be concluded that medium size firms have higher level of JIT purchasing implementation than small firms, in terms of utilizing reusable standards containers to hold parts in the production process.

Between small firms and large firms, T-tests (Figure 16, Appendix B) and the analysis of variable means (Figure 15, Appendix B) show that large size firms implement

the following practices at a higher level: PACKAGE ($p = 0.020$), COSTINFO ($p = .000$), QUALITY ($p = 0.012$), INVOLVE ($p = 0.001$), SUPPNUM ($p = 0.016$), ORGANIZE ($p = 0.016$), and SHAREINF ($p = 0.000$). Meanwhile, small firms are implementing MANAGERS ($p = 0.026$) at a higher level. It appears that large firms have a higher level of JIT purchasing implementation than small firms in terms of several practices. However, small firms tend to provide higher management support for their current purchasing strategies. This can be explained by the fact that managers in small firms understand their constraints, thus they are satisfied with their chosen purchasing strategies. In addition, all these small companies are private companies, which means the top managers are likely to be the owners. It is no surprise that they provide strong support to their organizations' chosen strategies.

T-tests between the medium size and large size firms (Figure 18, Appendix B) reveal that there are significant differences between these two groups in terms of MAXIMIZE ($p = 0.021$), INVOLVE ($p = 0.008$), ORGANIZE ($p = 0.021$), SHAREINF ($p = 0.000$). An examination of the means (Figure 17, Appendix B) show that large firms appear to implement these practices at a higher level. However, medium size firms implement MANAGERS ($p = 0.002$) at a higher level. The reason is as explained above. Most of the medium size firms are private.

In general, all the test results lead to the indication that firm size indeed affects the level of implementing JIT purchasing. The larger the firm is, the more it implements JIT purchasing.

5.3.2. The Effect of Ownership Types

Similarly to section 5.3.1, MANOVA is employed to find out whether the three groups of firms divided based on their ownership type significantly differ in terms of practices adopted. The results are presented in Table 14. All tests (Pillai's Trace $p = 0.000$; Wilks' Lambda $p = 0.000$; Hotelling's Trace $p = 0.000$; and Roy's Largest Root $p = 0.000$) yield significant results at the significant level of 95%. Therefore Hypothesis 2 is confirmed. Ownership types affect the level of implementation of JIT purchasing.

Table 14 : MANOVA Tests for Firm Groups divided based on Ownership Type

Multivariate Tests ^c						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.997	628.581 ^a	17.000	35.000	.000
	Wilks' Lambda	.003	628.581 ^a	17.000	35.000	.000
	Hotelling's Trace	305.311	628.581 ^a	17.000	35.000	.000
	Roy's Largest Root	305.311	628.581 ^a	17.000	35.000	.000
TYPE	Pillai's Trace	1.477	5.986	34.000	72.000	.000
	Wilks' Lambda	.067	5.925 ^a	34.000	70.000	.000
	Hotelling's Trace	5.858	5.858	34.000	68.000	.000
	Roy's Largest Root	3.563	7.545 ^b	17.000	36.000	.000

a. Exact statistic

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

c. Design: Intercept+TYPE

ANOVA analysis specifies the specific variables that make these groups differ. The results of the tests are presented in Figure 19 (Appendix C). Again, to reduce Bonferroni alpha, the alpha used for these tests is 1%. The variables that make these three groups differ are MAXIMIZE ($p = 0.001$), INVOLVE ($p = 0.000$), SUPPNUM ($p = 0.002$), SUPPORT ($p = 0.010$), INCENTIV ($p = 0.000$), ORGANIZE ($p = 0.000$), SHAREINF ($p = 0.000$), STRATEGY ($p = 0.000$), and MANAGERS ($p = 0.001$). Thus the three groups of firms divided based on ownership types are significantly different in

terms of most of the variables at the 99% significant level. If the 95% significant level were used, the three groups are also significantly different in terms of the following variables: MINIMIZE ($p = 0.019$), COSTINFO ($p = 0.013$), QUALITY ($p = 0.025$), and CROSSFUN ($p = 0.028$). In general, ANOVA tests again confirm that the level of JIT purchasing implementation differs across the groups of firms divided based on ownership types.

The assumptions of multivariate and univariate analysis are also examined. Again, the assumption of independence of observations is valid since the responses of each participating firm are independent from those of another. Second, the normality of data is tested (Figure 20, Appendix C). Histograms, skewness, and kurtosis for each variable are also examined to test for normality of distribution. The test results are significant at the 95% for most variables. Therefore, power of the tests may be affected. Box's test is also conducted to examine multivariate homogeneity of variances for MANOVA test (Figure 21, Appendix C). The result ($p = 0.000$) is significant at the 99% level. This may affect power of the MANOVA test. However, since the three group sizes are equal, the reduction in power may not be too large. Tests of homogeneity of variances (Figure 22, Appendix C) show that generalized variances are heterogeneous in most cases (9 out of 16 variables). However, since the sizes of each of the groups are equal (18 cases for each group), this may not affect power severely.

Paired-sample T-tests for each pair of groups are conducted next. The tests between state-owned enterprises and private companies indicate that the two groups

significantly differ in terms of most of the practices (Figure 24, Appendix C) at the 95% significant level. An examination of the variable means (Figure 23, Appendix C) indicates that state-owned enterprises implement the practices of COSTINFO ($p = 0.016$), QUALITY ($p = 0.000$), SUPPORT ($p = 0.019$), and SHAREINF ($p = 0.000$) at a higher level than the private sector, while the private companies implement the practices of MAXIMIZE ($p = 0.016$), STRATEGY ($p = 0.000$), and MANAGERS ($p = 0.000$) at a higher level than the state-owned enterprises. These results can be explained by examining the ways these two sectors operate. State-owned enterprises have a larger resource base which allows them to implement practices such as SUPPORT to their suppliers. In addition, they are more willing to share information with their suppliers, which leads to higher levels of implementation of QUALITY and COSTINFO.

Meanwhile private companies are more likely to hesitate to share their internal information with their suppliers. They also tend to have informal company structures where each employee may be in charged of a wide range of works, thereby knowledgeable about the activities of various departments in their organizations. Thus, they may not have formal programs aiming at developing cooperation among the departments. That means SHAREINF is implemented at a lower level for private firms. Furthermore, as explained above, the managers of private companies are most likely to be the owners, thus they provide full support to whatever strategies they chose to adopt. Therefore, it is explainable that STRATEGY and MANAGERS are implemented at higher level for private firms.

T-tests (Figure 26, Appendix C) and the analysis of variable means (Figure 25, Appendix C) between the groups of state-owned enterprises and foreign-invested companies show that these two groups of firms are significantly different in terms of various variables. State-owned enterprises implement QUALITY practice ($p = 0.025$) at a higher level. Meanwhile, foreign-invested firms implement MAXIMIZE ($p = 0.002$), CONTROL ($p = 0.049$), SUPPNUM ($p = 0.010$), INCENTIV ($p = 0.000$), ORGANIZE ($p = 0.000$), CROSSFUN ($p = 0.038$), STRATEGY ($p = 0.002$), and MANAGERS ($p = 0.007$) at a higher level. It appears that foreign-invested companies have a higher level of JIT purchasing implementation than state-owned companies. Most of these significant differences can be explained by the operational characteristics of the automobile industry, which makes up a large percentage of the sample size in this study.

Between private companies and foreign-invested firms, T-tests (Figure 28, Appendix C) and the analysis of means of the variables (Figure 27, Appendix C) indicate that there are a large number of significant differences at the 99% significant level between them. Foreign-invested firms is higher implemented in: COSTINFO ($p = 0.000$), QUALITY ($p = 0.000$), INVOLVE ($p = 0.000$), SUPPNUM ($p = 0.000$), SUPPORT ($p = 0.004$), INCENTIV ($p = 0.000$), ORGANIZE ($p = 0.000$), and SHAREINF ($p = 0.000$) while private companies are implementing MANAGERS ($p = 0.007$) at a higher level.

In general, the tests above confirm Hypothesis 2. The type of ownership of a company affects the likelihood of implementing JIT purchasing in that company. It also appears that state-owned enterprises and foreign-invested companies have a higher likelihood of implementing JIT purchasing than private firms.

5.4. The Effects of JIT Purchasing on Firm Performance

5.4.1. Correlation Analysis

A quick analysis of the correlations between the independent variables (i.e. JIT purchasing practices) and the dependent variables (i.e. firm performance) is helpful to understand how JIT purchasing may affect firm performance. As shown in Table 15, product quality (PROQUALI) is significantly positively correlated (at the 95% significant level) with the practices of communicating cost information with their suppliers, involving all functions in developing a long term relationship with the suppliers, sharing information among the departments within the organizations, and emphasizing cross-functional cooperation. This can be interpreted as JIT purchasing improves quality.

Product costs and productivity appear not to be related to the JIT purchasing practices (non-significant correlations at 95% significant level). This may be explained by the fact that the competition based on costs is the main competing ground and extremely heavy in Vietnam. The one that can cut costs is the one that will survive. That means manufacturing companies have to reduce costs to the lowest possible level regardless of what purchasing strategy they are using. Therefore, JIT purchasing may not result in a significant impact on reducing costs.

Lead-time is significantly positively correlated to the QUALITY practice at the 95% significant level. This practice aims at guaranteeing part/material quality at source and continuously improving their quality. It is understandable since this practice cut down the inspection time and the waiting time for replacing defective parts/materials.

Table 15: Correlation Matrix between Independent and Dependent Variables

<i>Dependent Variable</i> <i>Independent Variable</i>		PROQUALI	COSTS	PRODUCTI	LEADTIME
INTEGRAT	Pearson Correlation Sig. (2-tailed)	.038 .784	.065 .642	-.021 .881	.150 .279
PACKAGE	Pearson Correlation Sig. (2-tailed)	.052 .711	-.233 .090	-.153 .268	-.198 .152
MAXIMIZE	Pearson Correlation Sig. (2-tailed)	.262 .055	-.058 .678	.049 .726	.115 .409
COSTINFO	Pearson Correlation Sig. (2-tailed)	.271* .048	-.067 .631	-.138 .321	-.027 .849
MINIMIZE	Pearson Correlation Sig. (2-tailed)	.097 .484	.037 .793	-.004 .975	-.029 .835
CONTROL	Pearson Correlation Sig. (2-tailed)	.210 .127	.178 .198	.134 .333	-.034 .809
QUALITY	Pearson Correlation Sig. (2-tailed)	.138 .320	-.100 .472	-.248 .071	.320* .018
INVOLVE	Pearson Correlation Sig. (2-tailed)	.243 .076	-.114 .411	-.211 .126	.022 .875
SUPPNUM	Pearson Correlation Sig. (2-tailed)	.236 .055	-.080 .564	-.044 .753	-.051 .714
SUPPLIER	Pearson Correlation Sig. (2-tailed)	.009 .949	-.130 .349	-.171 .217	.068 .623
SUPPORT	Pearson Correlation Sig. (2-tailed)	-.044 .751	-.149 .282	-.265 .052	.006 .963
INCENTIV	Pearson Correlation Sig. (2-tailed)	.202 .143	-.127 .359	-.102 .464	-.399** .003
ORGANIZE	Pearson Correlation Sig. (2-tailed)	.317* .020	-.014 .922	-.005 .972	-.327* .016
SHAREINF	Pearson Correlation Sig. (2-tailed)	.395** .003	-.108 .438	-.216 .116	.129 .354
CROSSFUN	Pearson Correlation Sig. (2-tailed)	.326* .016	.201 .145	.197 .152	.111 .424
STRATEGY	Pearson Correlation Sig. (2-tailed)	-.039 .781	.057 .680	.160 .248	-.285* .037
MANAGERS	Pearson Correlation Sig. (2-tailed)	.104 .454	.086 .593	.153 .271	-.170 .219

Surprisingly, lead-time is negatively correlated (at the significant level of 95%) with the practices of providing incentives to their suppliers, involving all functions of the organization in the effort of developing long-term relationships with their suppliers and matching their overall strategies with their purchasing strategies. Strong competition and the capacity exceeding the demands are basically the explanations for this observation. Most manufacturing companies understand the importance of delivering orders whenever the customers demand. Thus they have no choice but to ensure that their lead-time is at least at the industry average, which means there is little room for improvement. Furthermore, a large number of cases in this sample are car-manufacturing companies. Even though industry analysis will be presented later, it can be mentioned briefly here that their capacity is much larger than the market demand, meaning their lead-time, though short, cannot beat the industry average where all factories are running under their capacity. However, they are the companies that are most likely to implement such practices as JIT purchasing. Therefore, it creates a negative correlation between these practices and the lead-time.

5.4.2. Cluster Analysis

Cluster analysis is used to divide the cases into groups. It is observed that clustering coefficients do not drop significantly when cluster number is increased from two to three. Therefore, the adequate number of clusters to extract would be two. Then ANOVA tests are conducted for each variable in order to compare cluster means. Results of cluster analysis with the cluster centers for all variables (including EXTEND) and ANOVA tests are summarized in Table 16.

Table 16 : Cluster Analysis of the Observations

Variables (Practices)	Cluster (number of companies)		ANOVA
	1 (35)	2 (19)	P
<i>Operational</i>			
INTEGRAT	3.74	3.63	.264
PACKAGE	1.57	3.00	.000**
MAXIMIZE	4.06	4.84	.017*
COSTINFO	1.63	4.00	.000*
MINIMIZE	3.17	3.37	.179
CONTROL	3.19	3.05	.486
QUALITY	1.81	2.65	.000**
INVOLVE	1.85	2.38	.000**
<i>Supplier-buyer relationship development</i>			
SUPPNUM	2.69	4.26	.000**
SUPPLIER	2.56	1.63	.000**
SUPPORT	1.45	1.27	.277
INCENTIV	2.83	3.34	.030*
EXTEND	1.00	1.00	.
ORGANIZE	2.69	3.11	.072
<i>Organizational</i>			
SHAREINF	3.49	4.32	.004**
CROSSFUN	2.06	2.05	.975
STRATEGY	3.83	3.58	.093
MANAGERS	4.26	3.63	.001**

* Significant at the 95% level

** Significant at the 99% level

The ANOVA analysis shows that 9 out of 17 variables are significantly different at the 95% significant level. Among these significantly different variables, the cluster centers reveal that, in general, the scores of cluster 1 are lower than those of cluster 2, except for the SUPPLIER and the MANAGERS variables. The analysis of the results leads to the distinction of two groups of companies according to their implementation of JIT purchasing.

(1) *High-JIT purchasing companies* (cluster 2): The companies that are characterized by their higher levels of implementation of the majority of the JIT purchasing practices

(2) *Low-JIT purchasing companies* (cluster 1): The companies that are characterized by their lower levels of implementation of the majority of the JIT purchasing practices

Most of previous studies tended to divide firms into JIT purchasing and non-JIT purchasing groups. However, this study decides to name the groups: high-JIT purchasing and low-JIT purchasing companies to reflect that the implementation level of JIT purchasing lays on a continuum. That means companies may implement JIT purchasing to a different extent and it is difficult to say that a firm does not implement any practice of JIT at all or implements all practices at the highest level. In addition, these names are also more appropriate for this study, since the data collected indicates that there is no company that does not implement any of the practices or implements all practices at the highest level.

5.4.3. The Effects of JIT Purchasing on Firm Performance

The discrimination between the two groups of companies allows for testing Hypothesis 3. MANOVA is conducted to determine if firm performance is significantly different between two clusters (Table 17). The tests having the same result in the case of two-group-MANOVA indicate that there is no significant difference between the two

clusters, high-JIT purchasing companies and low-JIT purchasing companies, in terms of performance. In other words, the level of implementation of JIT purchasing does not appear affect firm performance according to this statistical result. It can be concluded that for firms located in Vietnam, the JIT purchasing practices do not significantly impact firm performance in general.

Table 17 : MANOVA Analysis of Firm Performance

Multivariate Tests ^b						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.946	213.396 ^a	4.000	49.000	.000
	Wilks' Lambda	.054	213.396 ^a	4.000	49.000	.000
	Hotelling's Trace	17.420	213.396 ^a	4.000	49.000	.000
	Roy's Largest Root	17.420	213.396 ^a	4.000	49.000	.000
QCL_1	Pillai's Trace	.136	1.936 ^a	4.000	49.000	.119
	Wilks' Lambda	.864	1.936 ^a	4.000	49.000	.119
	Hotelling's Trace	.158	1.936 ^a	4.000	49.000	.119
	Roy's Largest Root	.158	1.936 ^a	4.000	49.000	.119

a. Exact statistic

b. Design: Intercept+QCL_1

However, ANOVA is still conducted to find out if any of the four dimensions of performance significantly differ between the low-JIT purchasing and high-JIT purchasing groups. The results of the tests are presented in Table 18. The results of the tests indicate that product quality is considered significantly different ($p = 0.051$) between two groups of firms. In other words, product quality of firms located in Vietnam is higher for those that implement JIT purchasing at a higher level. There is no significant difference between high-JIT purchasing companies and low-JIT purchasing companies in terms of costs, productivity, and lead-time.

Table 18 : ANOVA Analysis for the Firm Performance Dimensions

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
PROQUALI	Between Groups	5.539	1	5.539	3.973	.051
	Within Groups	72.498	52	1.394		
	Total	78.037	53			
COSTS	Between Groups	.814	1	.814	1.154	.288
	Within Groups	36.686	52	.705		
	Total	37.500	53			
PRODUCTI	Between Groups	1.287	1	1.287	2.205	.144
	Within Groups	30.361	52	.584		
	Total	31.648	53			
LEADTIME	Between Groups	.442	1	.442	.612	.438
	Within Groups	37.558	52	.722		
	Total	38.000	53			

Generally, Hypothesis 3 is rejected. However, one should be careful with generalizing the results of this study due to the small sample size and unequal group sizes. These limitations can affect the significant levels and reduce power of the tests profoundly. As explained previously, the automobile industry, which accounts for a large percentage of the sample size, appear to practices most of JIT purchasing practices at a higher level than other firms. However, the performance of a car manufacturing company, when compared to other companies in the same industry, may not reflect any advantages since they all are competing based on costs and operating significantly under their capacity. Therefore, when correlation analysis (Section 5.4.1.) and ANOVA results are taken into account, the rejection of Hypothesis 3 may be a result of data bias. In fact, these statistics reflect that product quality is most likely to be affected by the implementation of JIT purchasing. The rejection of the significant impact of JIT purchasing on the other dimensions of firm performance may be resulted from data bias.

All assumptions of MANOVA and ANOVA tests are examined. First, the independence of observations is considered. In this case, the independence of observations within each group may not be certain, since cluster analysis selects the cases in each group so that they have common characteristics. The homogeneity of generalized variances between two clusters is also tested. The test is shown in Table 19. The result indicates that the variances are indeed homogeneous.

Table 19 : Homogeneity of Variances for MANOVA

Box's Test of Equality of Covariance

^a

Box's	8.501
F	.769
df1	10
df2	6427.11
Sig.	.659

Tests the null hypothesis that the observed matrices of the dependent variables are equal across

a. Design:

Table 20 shows the results of tests of normality of the four dimensions of performance. Histogram, Skewness, and Kurtosis tests are also performed. The results reveal that the data are non-normally distributed. That means power of the tests is affected.

Tests of homogeneity of variances (shown in Table 21) indicate that variances are indeed homogeneous. Therefore, the unequal group size would not have severe impact on power of the tests.

Table 20 : Tests of Normality

		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
Cluster Number of Case		Statistic	df	Sig.	Statistic	df	Sig.
PROQUALI	1	.177	35	.007	.860	35	.010**
	2	.213	19	.024	.899	19	.047
COSTS	1	.219	35	.000	.864	35	.010**
	2	.205	19	.034	.808	19	.010**
PRODUCTI	1	.262	35	.000	.845	35	.010**
	2	.234	19	.007	.804	19	.010**
LEADTIME	1	.324	35	.000	.742	35	.010**
	2	.317	19	.000	.778	19	.010**

** . This is an upper bound of the true significance.

a. Lilliefors Significance Correction

Table 21 : Tests of Homogeneity of Variances

Test of Homogeneity of Variances				
	Levene Statistic	df1	df2	Sig.
PROQUALI	2.198	1	52	.144
COSTS	.329	1	52	.569
PRODUCTI	.041	1	52	.840
LEADTIME	2.155	1	52	.148

5.5. The Effects of Firm Size and Ownership on the Impact of JIT Purchasing

5.5.1. The Effect of Firm Size

The effects of firm size on the influence of JIT purchasing on firm performance is tested by conducting MANOVA and ANOVA on firm performance variables in the high-JIT group, or cluster 2. Analysis of variance is not used since the control variable in this case (SIZE) has only two categories (medium: 2 cases, and large: 17 cases). MANOVA results (Figure 29, Appendix D) indicate that there is no significant difference in term of performance between the medium firm size and large firm size groups at the 95%

significant level (Pillai's Trace $p = 0.078$; Wilks' Lambda $p = 0.078$; Hotelling's Trace $p = 0.078$, and Roy's Largest Root $p = 0.078$). That means Hypothesis 4 "Firm size affects the impact of JIT purchasing on firm performance" is rejected. However, ANOVA results (Figure 30, Appendix D) show that productivity ($p = 0.037$) is significantly different at the significant level of 95% between these two groups. In short, Hypotheses 4a, 4b, and 4d are rejected while Hypothesis 4c is confirmed.

The assumptions for the multivariate analysis are conducted. Again, this set of data is likely to have dependent observations and non-normal distribution. The results of the tests of homogeneity of variances are shown in Figure 31 (Appendix D). Only the variance of Productivity is heterogeneous. In general, since the sample size is small and the group sizes are unequal, power is likely to be reduced.

In short, the test results lead to the conclusion that firm size does not affect the influence of JIT purchasing on firm performance. In other words, for the firms located in Vietnam, JIT purchasing will have the same effects on firms regardless of their sizes. However, if ANOVA is taken into account, JIT purchasing appears to affect productivity.

5.5.2. The Effect of Ownership Type

Similarly to section 5.5.1, only the high-JIT purchasing company group is used in this analysis. In this data set, 7 observations are state-owned enterprises, 1 private firm, and 11 foreign-invested companies. MANOVA results (Figure 32, Appendix D) point out that there is no significant difference in term of performance among the firms of three

different ownerships at the 95% significant level (Pillai's Trace $p = 0.062$; Wilks' Lambda $p = 0.074$; Hotelling's Trace $p = 0.090$, and Roy's Largest Root $p = 0.041$). That means Hypothesis 5 "Ownership type affects the impact of JIT purchasing on firm performance" should be rejected. ANOVA tests (Figure 33, Appendix D) also confirm that Hypothesis 5 should be rejected.

Again, the assumptions for the multivariate analysis are conducted. Similarly to the analysis in the previous section, this set of data is likely to have independent observations and non-normal distribution. The results of the tests of homogeneity of variances are shown in Figure 34 (Appendix D). The variances are indeed homogeneous. In general, since the sample size is small and the group sizes are unequal, power is likely to be reduced.

5.6. Industry Analysis

It appears that industry sector has a significant role in explaining this data set. It is observed that each industry has their own distinct operational characteristics and manufacturing plants in the same industries behave very similarly. Following are the highlights of some characteristics of each industry participating in this study.

Food / Beverage Industry

Companies in this industry are further divided into small subgroups: the group with a large supplier base (sugar & dairy products) and the group with a smaller supplier base (noodle & biscuits & MSG, and beverages). For the first group, their main suppliers

are individual farmers. Sugar-cane trees or fresh milk are delivered to the plants daily due to their short shelf life. Therefore, geographical distance is important in selecting suppliers. In fact, it is one of the most important criteria in selecting suppliers. Since these companies are in shortage of supplies, they cannot afford to be too strict in selecting suppliers. There is a fairly close relationship between the manufacturing companies and their suppliers, in that the plants make attempts to financially and technically support their suppliers while the suppliers, being individual farmers, hardly provide any support to their buyers. Therefore, the suppliers in this case are not willing or unable to get involved in the operations of the purchasing organizations.

The specific kinds of support provided to the suppliers include setting up supplier associations, providing loans, agricultural products, holding annual supplier conventions, and awarding suppliers that deliver the product on time and meet quality standards. Suppliers are also not able to inspect their quality thus making it a task for the buyers. The plants are also required to organize transportation methods for supplies purchased, since their suppliers are hardly able to possess transportation means. Notice that even though the manufacturer of dairy products is a monopoly in southern Vietnam, its capacity greatly exceeds market demand.

Those companies with a small supplier base in the study normally produce based on demand forecasts and specific orders. Supplies for these plants are mainly imported, with a strictly transaction-based relationship. Neither the supplier nor the buyer intends to provide further support or be involved in each other's internal activities.

Footwear Industry

This industry is characterized by intense labor. Most of the supplies used in these manufacturing companies are imported. If a factory is a contractor for a foreign company, the foreign company is most likely to decide on the supply sources, quality standards, and prices as well as to manage the relationship with their suppliers. Therefore, the purchasing department of the firm located in Vietnam is reduced to several operational and organizational practices. This industry is also one of a few industries that implemented the PACKAGE practice (i.e. the use of small standard containers to hold parts at workstations during the production process).

Textile / Garments / Accessories Industry

Again, a large percentage of supplies used in this industry are imported. It is also a labor intense industry. The Textile industry is characterized by a continuous manufacturing process, which does not utilize PACKAGE practices. Meanwhile companies in the Garments/Accessories industry do employ it to a great extent. Similarly in the Footwear industry, if a plant is a contractor, its purchasing activities are limited to fewer practices, since headquarters makes most of the purchasing decisions.

Paper Industry

There are two distinct types of paper manufacturing companies: those that use paper powder as their main materials and those that use recycled paper. For the first group of firms, their main suppliers are foreign and the relationship with their suppliers is

basically transaction based. Of course, suppliers and buyers do collaborate to a certain extent to solve any problems that may occur. Meanwhile, the main suppliers of the second group of companies are a large-base of private individuals that go from house to house to purchase old paper products. Therefore, interacting with this type of supplier is quite different from dealing with large foreign suppliers. To deal with these individual suppliers, managers usually demonstrate a high level of informal commitment and use incentives such as fast payments. However, the firms and these suppliers rarely provide much support, or formal agreements to each other.

Packaging Industry

The packaging industry is operating based on orders. Since approximately half of its supplies are local sources, it is able to implement a higher level of the practice of frequent deliveries in small lot sizes. In addition, the main supply of the packaging industry is paper, which is bulky and subject to spoilage in the humid weather of Vietnam. Therefore, companies in this industry avoid long-term storage.

Automobile Industry

The automobile industry in Vietnam is essentially comprised of joint ventures. These manufacturing companies mainly assemble vehicles from imported parts purchased from suppliers that are selected by their foreign partners. Therefore, these automobile companies do not select nor evaluate their suppliers, yet they have a closer tie with their suppliers than firms in other industries.

Generally, the automobile industry implements most of the JIT purchasing practices at a higher level than any other industry in Vietnam. However, all of their products are sold locally where the local demand is much lower than the companies' capacity. Thus, JIT purchasing is unable to influence firm performance significantly, since all firms are performing roughly at the industry average. The characteristics of this industry explain various unexpected findings in this study.

Personal Care Industry

The personal care industry in Vietnam is growing quickly to meet the demands of such as large domestic market. Firms are usually large to be able to develop and market new products. Again, most of the supplies of companies in this industry are imported. Since their products can be stored and the firms have direct interaction with the retailers, most firms schedule their production based on demand forecasts. The companies in this study that belong to the personal care industry are foreign subsidiaries. Thus, they are practicing most of JIT purchasing practices at a higher level than local companies, except for selecting and evaluating suppliers. Again, mainly their respective headquarters influences these decisions.

Industrial Chemicals Industry

The respondent firm is a monopoly in the southern region. However, it is still facing strong competition from foreign suppliers that market their products in Vietnam. Most of its materials are imported according to production scheduling based on demand forecasts. Again, since their materials are quite generic, they have no need to ensure a

close relationship with certain suppliers. Instead, they constantly look for cheaper and better supply sources to remain competitive.

Tobacco Industry

The tobacco company is very similar to the sugar industry in that most of their suppliers are individual farmers. Even though the company itself has its own cigar farm, it relies heavily on independent farmers. Therefore, its interaction with its suppliers is very similar to that of the sugar industry. That means the company provides extensive financial and technical support to their suppliers, demonstrates a high level of informal commitment, and rewards them annually based on their performance.

Electronic Equipment Industry

The respondent is the biggest manufacturer in the industry of the southern region. The majority of its parts are imported according to customers' orders. The company provides no support to its suppliers since the suppliers are much larger multinational corporations.

Plastic Products Industry

The majority of the materials used are imported. Again, these are not scarce materials, thus the respondent firm does not feel they have to maintain a close relationship with their suppliers. Notice that the buyers of the participating firm are corporate buyers.

Handicraft Industry

Most of companies in this industry are small or medium, since they are usually based on traditional family businesses. Most of the materials are local. Again, the respondent firm demonstrates a high level of informal commitment to their suppliers. However, the company does not provide support to their suppliers because of its limited resources and the ease with which it acquires the materials that it needs.

Porcelains Industry

This is a very old industry that has traditionally produced manually. The industry has gone through significant changes to utilize machinery in the production process. As the industry modernizes its process and the competition grows stronger, the purchasing strategy of the firms in the industry also changes to ensure that they stay competitive. The respondent firm indicates that they show a strong informal commitment to their suppliers, to ensure that they have several suppliers for their main materials.

School/office Supplies Industry

There are only a small number of firms in this industry since it is difficult to establish brand reputation. Companies in this industry produce according to demand forecasts. Since these are seasonal products, it is likely that firms stock supplies and inventories in the high season and reduce them in the low season. The respondent company indicates that they maintain a line of communication concerning mutual beneficial issues with their suppliers, but does not emphasize providing support or maintaining long-term relationships.

5.7. Summary

The study suggests that the size and the ownership of a firm affect its likelihood of implementing JIT purchasing. Specifically, the larger the firm is, the higher level of implementation of JIT purchasing. In addition, state-owned enterprises and foreign-invested firms tend to have higher levels of implementation of JIT purchasing than private companies. This is similar to a suggestion made by Lawrence and Lewis in their study on JIT purchasing in Mexico (1994, 1996). In this study, they said that size affects the feasibility of implementing JIT purchasing and the ability to overcome obstacles in the implementation process.

However, this study implies that JIT purchasing does not significantly affect firm performance in general. It suggests that product quality is likely to improve with higher levels of JIT purchasing implementation. The findings can be explained by the fact that companies located in Vietnam are competing mainly based on cost. Thus, even if a manufacturing company does not adopt JIT purchasing at a higher level, it still has to ensure that it can cut costs to the lowest possible level or it would not survive. Therefore, implementing JIT purchasing does not translate directly to costs saving or productivity improvement. Lead-time is not influenced by JIT purchasing since a large number of companies are operating under capacity. Therefore, meeting customers' demand quickly is not a challenge. Those that do not have excess capacity are well aware that if they turn down an order, the customer may never come back. Therefore, they themselves have contingency plans in those situations. In short, similarly to cost, lead-time is a competitive factor that all firms must consider regardless of their purchasing strategies.

This conclusion is in contradiction to most of the studies conducted in the past. However, the generalizability of these results is fairly low, due to the small sample size and the unique characteristics of the industries participating in the study. If one takes into account the correlation analysis between the individual practices of JIT purchasing and the four dimensions of firm performance, there are significant positive correlations between JIT purchasing and firm performance.

The analysis leads to the conclusion that plant size and ownership type do not affect the impact of JIT purchasing on performance. That means if companies of different sizes or ownership types implement JIT purchasing to the same extent, they are expected to receive the same effect of firm performance if there is any. This conclusion contradicts the research results in Lawrence and Lewis' (1996) study, in which they suggested that size had an effect on the relationship between JIT purchasing variables and firm performance.

Due to a small sample size and unequal representation of different size firms, it is likely that power of the tests is reduced. Thus, one should not generalize the test results in this study with absolute certainty.

Finally, it is essential to understand one of the common purchasing practices of firms located in Vietnam when supplies are of foreign origin. It is the practice of purchasing imported parts/materials from import-export agencies. This allows firms to acquire the necessary supplies in even small quantities. It also reduces complications with

customs paperwork and import costs. In this case, it is a challenge to determine who are the suppliers to a specific firm: the foreign suppliers that the firm has no contact with or the intermediate agency that does not produce the supplies? Most firms in this study were asked to consider only suppliers that they have direct contacts with.

CHAPTER 6

CONCLUSIONS

The conclusions of this study are presented in this chapter, as well as an explanation of the limitations. Finally, recommendations to the managers of companies located in Vietnam and future researchers are suggested.

6.1. Conclusions

Literature reviews indicate that JIT purchasing is comprised of various practices, which have the potential to improve performance, particularly in terms of quality, cost, productivity and lead-time. It also reveals that firm size is likely to influence the implementation of JIT purchasing and its effect on firm performance. Similarly, ownership type in the case of Vietnam may have the same behavior. Based on a sample of 54 manufacturing companies located in Vietnam, this study finds that the size and ownership of firms indeed affect the level of adoption of JIT purchasing practices in Vietnam.

It also suggests that firm performance is not affected strongly by JIT purchasing implementation. In fact, if the ANOVA test result and correlation analysis are taken into account, it can only be concluded that JIT purchasing has an impact on firm performance in terms of product quality. However, it is recognized that small sample size and sample bias are likely to be the root cause of this finding. Finally, the study results in the conclusion that the impact of JIT purchasing on firm performance is not affected

significantly by either firm size or ownership. However, if ANOVA and correlation analysis are taken into account, the effect of JIT purchasing on the lead-time appears to be influenced by size.

6.2. Limitations of the Study

Of course, this study is not without limitations. The biggest limitation is the small sample size and the sample selection method. This affects the power of the tests conducted and the generalizability of the conclusions. Therefore, one should apply the results of this study with caution.

Secondly, this research by no means reveals completely all factors that need to be taken into account in evaluating the implementation level of JIT purchasing and its impact on firm performance. Other economic and social factors may play important roles in clarifying the nature of the adoption of JIT purchasing in Vietnam and how it affects companies located in that country.

Third, it was noticed that using the number of employees to determine firm size does not necessarily reflect the financial and technological resources of a company. There are industries that are labor intense by nature, yet they are resource-poor. Finally, firm performance is evaluated based on respondents' perception about the performance of their companies compared to other companies of the same industry in Vietnam. Therefore, performance measurements are entirely subjective and may vary significantly from the standards of the same types of products in other parts of the world.

6.3. Recommendations

The results of the study show that JIT purchasing appears to affect firm performance in terms of product quality. They also reveal that one of the main obstacles for implementing JIT purchasing in Vietnam is that most of parts/materials purchased by firms are from foreign sources. Thus, it is suggested that developing high quality local source of supplies is an area that businesses in Vietnam can invest into in order to improve firm performance. The study also implies that a large number of companies in Vietnam still consider suppliers outsiders with which sensitive information should not be shared. To change this mentality, it would require effort from both suppliers and buyers to get involved in the other's business and to provide support if necessary. A strong and reliable network of suppliers would be considerably helpful for manufacturing companies located in Vietnam.

Generally, the results of this study suggest that as companies grow bigger, they are likely to adopt managerial practices that have proven to be successful in other parts of the world. However, not all practices are applicable in the operating environment of Vietnam or provide the same level of success as they did in other countries. In this study case, both the quantitative and qualitative analyses suggest that JIT purchasing affects only certain aspects of firm performance and industry sector has a significant impact on the purchasing practices that a firm implements. In short, companies located in Vietnam should proceed with caution in adopting new managerial practices. It is essential for firms to understand the operating environment of Vietnam and the industry they are in. They may have to revise the practices implemented to adjust for the local environment.

Finally, future research may replicate this study with a larger sample size to clarify the effects of JIT purchasing on firm performance in Vietnam. A random sampling method can be used to avoid data bias. Future research may also investigate a specific industry as this study shows that industry sector is a critical factor to explain the effect of JIT purchasing for firms in Vietnam. Researchers could investigate the changes in JIT purchasing practices that need to be made in order to yield significant results in the case of Vietnam. Particularly, one may explore how to deal with the issue of importing supplies through a third party in the case of Vietnamese firms. Furthermore, similar studies to this study can be conducted in different developing countries to understand thoroughly whether managerial practices implemented successfully in the developed world can be adopted with success in radically different environments. One could also conduct a study to examine if other managerial practices, such as supply chain management or manufacturing flexibility, are implemented in companies located in Vietnam and how they affect these companies.

APPENDIX A

	INTEGRAT	PACKAGE	MAXIMIZE	COSTINFO	MINIMIZE	CONTROL
INTEGRAT Correlation Sig. (2-tailed)	1.000					
PACKAGE Correlation Sig. (2-tailed)	-.130 .348	1.000				
MAXIMIZE Correlation Sig. (2-tailed)	-.078 .576	.414 .002	1.000			
COSTINFO Correlation Sig. (2-tailed)	-.075 .590	.566 .000	.297 .029	1.000		
MINIMIZE Correlation Sig. (2-tailed)	.374 .005	.338 .013	.021 .880	.264 .054	1.000	
CONTROL Correlation Sig. (2-tailed)	.032 .818	-.001 .993	.135 .332	.113 .417	-.017 .903	1.000
QUALITY Correlation Sig. (2-tailed)	.108 .437	.317 .019	-.086 .538	.601 .000	.249 .069	-.179 .195
INVOLVE Correlation Sig. (2-tailed)	-.055 .693	.149 .283	.074 .597	.651 .000	.059 .671	.089 .522
SUPPNUM Correlation Sig. (2-tailed)	-.038 .785	.407 .002	.579 .000	.638 .000	.123 .377	.127 .359
SUPPLIER Correlation Sig. (2-tailed)	.157 .256	-.405 .002	-.245 .074	-.580 .000	-.131 .344	.051 .714
SUPPORT Correlation Sig. (2-tailed)	.204 .139	-.163 .239	-.551 .000	-.001 .993	-.067 .628	-.058 .679
INCENTIV Correlation Sig. (2-tailed)	.140 .314	.225 .102	.126 .365	.480 .000	.120 .389	.321 .018
EXTENDJI Correlation Sig. (2-tailed)	.	.	.	.	.	.
ORGANIZE Correlation Sig. (2-tailed)	-.111 .425	.134 .333	.198 .152	.415 .002	-.038 .787	.235 .087
SHAREINF Correlation Sig. (2-tailed)	-.029 .835	-.029 .834	-.062 .655	.449 .001	-.146 .293	-.091 .511
CROSSFUN Correlation Sig. (2-tailed)	.096 .488	-.321 .018	.032 .817	-.078 .576	-.053 .703	-.009 .946
STRATEGY Correlation Sig. (2-tailed)	.228 .097	.029 .838	.052 .710	-.273 .046	.310 .023	.024 .861
MANAGERS Correlation Sig. (2-tailed)	.202 .144	-.208 .131	.054 .698	-.385 .004	.186 .179	.152 .273

	QUALITY	INVOLVE	SUPPNUM	SUPPLIER	SUPPORT	INCENTIV
INTEGRAT Correlation Sig. (2-tailed)						
PACKAGE Correlation Sig. (2-tailed)						
MAXIMIZE Correlation Sig. (2-tailed)						
COSTINFO Correlation Sig. (2-tailed)						
MINIMIZE Correlation Sig. (2-tailed)						
CONTROL Correlation Sig. (2-tailed)						
QUALITY Correlation Sig. (2-tailed)	1.000					
INVOLVE Correlation Sig. (2-tailed)	.610 .000	1.000				
SUPPNUM Correlation Sig. (2-tailed)	.183 .185	.509 .000	1.000			
SUPPLIER Correlation Sig. (2-tailed)	-.108 .435	-.271 .047	-.437 .001	1.000		
SUPPORT Correlation Sig. (2-tailed)	.282 .039	.163 .238	-.357 .008	.257 .060	1.000	
INCENTIV Correlation Sig. (2-tailed)	.036 .797	.424 .001	.424 .001	-.289 .034	.297 .029	1.000
EXTENDJI Correlation Sig. (2-tailed)	. .	. .	. .	. .	. .	. .
ORGANIZE Correlation Sig. (2-tailed)	-.033 .812	.364 .007	.419 .002	-.144 .298	.153 .269	.668 .000
SHAREINF Correlation Sig. (2-tailed)	.558 .000	.691 .000	.310 .023	.033 .813	.298 .028	.335 .013
CROSSFUN Correlation Sig. (2-tailed)	-.161 .244	.095 .492	.057 .680	.310 .023	-.060 .668	.164 .237
STRATEGY Correlation Sig. (2-tailed)	-.355 .008	-.122 .379	-.020 .888	.167 .229	-.129 .353	.229 .095
MANAGERS Correlation Sig. (2-tailed)	-.534 .000	-.392 .003	-.104 .455	.212 .124	-.091 .514	.123 .376

	EXTENDJI	ORGANIZE	SHAREINF	CROSSFUN	STRATEGY	MANAGERS
INTEGRAT Correlation Sig. (2-tailed)						
PACKAGE Correlation Sig. (2-tailed)						
MAXIMIZE Correlation Sig. (2-tailed)						
COSTINFO Correlation Sig. (2-tailed)						
MINIMIZE Correlation Sig. (2-tailed)						
CONTROL Correlation Sig. (2-tailed)						
QUALITY Correlation Sig. (2-tailed)						
INVOLVE Correlation Sig. (2-tailed)						
SUPPNUM Correlation Sig. (2-tailed)						
SUPPLIER Correlation Sig. (2-tailed)						
SUPPORT Correlation Sig. (2-tailed)						
INCENTIV Correlation Sig. (2-tailed)						
EXTENDJI Correlation Sig. (2-tailed)	1.000					
ORGANIZE Correlation Sig. (2-tailed)	.	1.000				
SHAREINF Correlation Sig. (2-tailed)	.	.339 .003	1.000			
CROSSFUN Correlation Sig. (2-tailed)	.	.322 .018	.223 .105	1.000		
STRATEGY Correlation Sig. (2-tailed)	.	.251 .067	-.213 .122	.345 .011	1.000	
MANAGERS Correlation Sig. (2-tailed)	.	.176 .204	-.352 .009	.236 .086	.597 .000	1.000

APPENDIX B

Figure 10 : Results of ANOVA Tests for Firm Groups divided based on Size

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
INTEGRAT	Between Groups	9.814E-02	2	4.907E-02	.399	.673
	Within Groups	6.272	51	.123		
	Total	6.370	53			
PACKAGE	Between Groups	5.046	2	2.523	1.485	.236
	Within Groups	86.657	51	1.699		
	Total	91.704	53			
MAXIMIZE	Between Groups	2.655	2	1.328	.976	.384
	Within Groups	69.345	51	1.360		
	Total	72.000	53			
COSTINFO	Between Groups	16.174	2	8.087	4.727	.013
	Within Groups	87.251	51	1.711		
	Total	103.426	53			
MINIMIZE	Between Groups	1.987	2	.993	4.263	.019
	Within Groups	11.884	51	.233		
	Total	13.870	53			
CONTROL	Between Groups	.863	2	.432	.985	.380
	Within Groups	22.345	51	.438		
	Total	23.208	53			
QUALITY	Between Groups	3.839	2	1.920	3.949	.025
	Within Groups	24.788	51	.486		
	Total	28.628	53			
INVOLVE	Between Groups	2.878	2	1.439	9.199	.000
	Within Groups	7.977	51	.156		
	Total	10.854	53			
SUPPNUM	Between Groups	7.852	2	3.926	3.128	.052
	Within Groups	64.018	51	1.255		
	Total	71.870	53			
SUPPLIER	Between Groups	.242	2	.121	.237	.790
	Within Groups	26.114	51	.512		
	Total	26.356	53			
SUPPORT	Between Groups	.948	2	.474	1.446	.245
	Within Groups	16.719	51	.328		
	Total	17.667	53			
INCENTIV	Between Groups	2.403	2	1.202	1.764	.182
	Within Groups	34.731	51	.681		
	Total	37.134	53			
ORGANIZE	Between Groups	6.262	2	3.131	5.462	.007
	Within Groups	29.238	51	.573		
	Total	35.500	53			
SHAREINF	Between Groups	23.283	2	11.641	17.436	.000
	Within Groups	34.051	51	.668		
	Total	57.333	53			
CROSSFUN	Between Groups	.168	2	8.391E-02	.325	.724
	Within Groups	13.166	51	.258		
	Total	13.333	53			
STRATEGY	Between Groups	1.151	2	.575	2.220	.119
	Within Groups	13.220	51	.259		
	Total	14.370	53			
MANAGERS	Between Groups	5.875	2	2.938	7.472	.001
	Within Groups	20.051	51	.393		
	Total	25.926	53			

Figure 11 : Tests of Normality

Tests of Normality ^b							
Variable	SIZE	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
INTEGRAT	1.00	.223	6	.200*	.898	6	.387
	2.00	.198	7	.200*	.896	7	.356
	3.00	.227	41	.000	.903	41	.010**
PACKAGE	1.00	.407	6	.002	.625	6	.010**
	2.00	.203	7	.200*	.873	7	.254
	3.00	.324	41	.000	.747	41	.010**
MAXIMIZE	1.00	.392	6	.004	.700	6	.010**
	2.00	.504	7	.000	.457	7	.010**
	3.00	.338	41	.000	.642	41	.010**
COSTINFO	1.00	.492	6	.000	.511	6	.010**
	2.00	.331	7	.020	.771	7	.028
	3.00	.219	41	.000	.856	41	.010**
MINIMIZE	1.00	.407	6	.002	.625	6	.010**
	2.00	.345	7	.012	.728	7	.010**
	3.00	.512	41	.000	.420	41	.010**
CONTROL	1.00	.333	6	.036	.851	6	.199
	2.00	.287	7	.084	.803	7	.051
	3.00	.153	41	.016	.943	41	.059
QUALITY	1.00	.492	6	.000	.511	6	.010**
	2.00	.348	7	.011	.767	7	.025
	3.00	.142	41	.036	.908	41	.010**
INVOLVE	1.00	.293	6	.117	.814	6	.084
	2.00	.242	7	.200*	.869	7	.239
	3.00	.252	41	.000	.844	41	.010**
SUPPNUM	1.00	.254	6	.200*	.864	6	.252
	2.00	.173	7	.200*	.919	7	.461
	3.00	.217	41	.000	.881	41	.010**
SUPPLIER	1.00	.492	6	.000	.511	6	.010**
	2.00	.256	7	.182	.832	7	.091
	3.00	.190	41	.001	.901	41	.010**
SUPPORT	1.00	.319	6	.056	.659	6	.010**
	2.00	.360	7	.007	.659	7	.010**
	3.00	.337	41	.000	.589	41	.010**
INCENTIV	1.00	.295	6	.112	.876	6	.296
	2.00	.263	7	.156	.916	7	.445
	3.00	.093	41	.200*	.960	41	.288
ORGANIZE	1.00	.254	6	.200*	.864	6	.252
	2.00	.435	7	.000	.598	7	.010**
	3.00	.244	41	.000	.838	41	.010**
SHAREINF	1.00	.319	6	.056	.659	6	.010**
	2.00	.256	7	.182	.832	7	.091
	3.00	.237	41	.000	.812	41	.010**
CROSSFUN	1.00	.333	6	.036	.851	6	.199
	2.00	.504	7	.000	.457	7	.010**
	3.00	.439	41	.000	.615	41	.010**
STRATEGY	2.00	.357	7	.007	.783	7	.036
	3.00	.423	41	.000	.630	41	.010**
MANAGERS	1.00	.319	6	.056	.659	6	.010**
	2.00	.435	7	.000	.598	7	.010**
	3.00	.345	41	.000	.794	41	.010**

*. This is a lower bound of the true significance.

**. This is an upper bound of the true significance.

a. Lilliefors Significance Correction

b. STRATEGY is constant when SIZE = 1.00. It has been omitted.

Figure 12 : Tests of Homogeneity of Variances**Levene's Test of Equality of Error Variances^a**

	F	df1	df2	Sig.
INTEGRAT	.933	2	51	.400
PACKAGE	4.179	2	51	.021
MAXIMIZE	3.637	2	51	.033
COSTINFO	4.329	2	51	.018
MINIMIZE	14.572	2	51	.000
CONTROL	3.035	2	51	.057
QUALITY	2.480	2	51	.094
INVOLVE	1.282	2	51	.286
SUPPNUM	1.014	2	51	.370
SUPPLIER	4.102	2	51	.022
SUPPORT	.954	2	51	.392
INCENTIV	2.876	2	51	.066
ORGANIZE	.316	2	51	.731
SHAREINF	.329	2	51	.721
CROSSFUN	.935	2	51	.399
STRATEGY	8.395	2	51	.001
MANAGERS	.088	2	51	.916

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept+SIZE

Figure 13 : Analysis of Means between Small Firm and Medium Firm Groups

Group Statistics					
	SIZE	N	Mean	Std. Deviation	Std. Error Mean
INTEGRAT	1.00	6	3.7222	.3897	.1591
	2.00	7	3.8095	.4658	.1760
PACKAGE	1.00	6	1.3333	.5164	.2108
	2.00	7	2.5714	1.2724	.4809
MAXIMIZE	1.00	6	4.0000	1.6733	.6831
	2.00	7	4.8571	.3780	.1429
COSTINFO	1.00	6	1.1667	.4082	.1667
	2.00	7	1.8571	1.2150	.4592
MINIMIZE	1.00	6	3.3333	.5164	.2108
	2.00	7	3.7143	.9512	.3595
CONTROL	1.00	6	3.0000	.3162	.1291
	2.00	7	2.8571	.6268	.2369
QUALITY	1.00	6	1.4444	.2722	.1111
	2.00	7	1.8571	.6901	.2608
INVOLVE	1.00	6	1.5556	.1361	5.556E-02
	2.00	7	1.6905	.4017	.1518
SUPPNUM	1.00	6	2.1667	.7528	.3073
	2.00	7	3.2857	1.1127	.4206
SUPPLIER	1.00	6	2.0833	.2041	8.333E-02
	2.00	7	2.3571	.3780	.1429
SUPPORT	1.00	6	1.1667	.1826	7.454E-02
	2.00	7	1.1429	.1782	6.734E-02
INCENTIV	1.00	6	2.5556	.5741	.2344
	2.00	7	2.7143	.4973	.1880
ORGANIZE	1.00	6	2.1667	.7528	.3073
	2.00	7	2.2857	.4880	.1844
SHAREINF	1.00	6	2.5000	.5477	.2236
	2.00	7	2.7143	.7559	.2857
CROSSFUN	1.00	6	2.0000	.3162	.1291
	2.00	7	1.9286	.1890	7.143E-02
STRATEGY	1.00	6	4.0000	.0000	.0000
	2.00	7	4.0000	.5774	.2182
MANAGERS	1.00	6	4.5000	.5477	.2236
	2.00	7	4.7143	.4880	.1844

Figure 14 : T-Tests between Small Firm and Medium Firm Groups

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
INTEGRAT	Equal variances assumed	.178	.681	-.363	11	.724	-8.730E-02	.2408	-.6173	.4427
	Equal variances not assumed			-.368	10.999	.720	-8.730E-02	.2373	-.6095	.4349
PACKAGE	Equal variances assumed	6.831	.024	-2.221	11	.048	-1.2381	.5576	-2.4653	-1.09E-02
	Equal variances not assumed			-2.358	8.166	.045	-1.2381	.5251	-2.4447	-3.15E-02
MAXIMIZE	Equal variances assumed	11.166	.007	-1.326	11	.212	-.8571	.6466	-2.2802	.5660
	Equal variances not assumed			-1.228	5.438	.270	-.8571	.6979	-2.6085	.8943
COSTINFO	Equal variances assumed	6.973	.023	-1.322	11	.213	-.6905	.5222	-1.8398	.4588
	Equal variances not assumed			-1.413	7.528	.198	-.6905	.4885	-1.8294	.4485
MINIMIZE	Equal variances assumed	5.389	.040	-.873	11	.401	-.3810	.4362	-1.3410	.5791
	Equal variances not assumed			-.914	9.489	.383	-.3810	.4168	-1.3164	.5545
CONTROL	Equal variances assumed	9.290	.011	.504	11	.624	.1429	.2835	-.4812	.7669
	Equal variances not assumed			.530	9.127	.609	.1429	.2698	-.4662	.7519
QUALITY	Equal variances assumed	11.838	.006	-1.369	11	.198	-.4127	.3014	-1.0760	.2506
	Equal variances not assumed			-1.456	8.057	.183	-.4127	.2835	-1.0656	.2403
INVOLVE	Equal variances assumed	18.875	.001	-.781	11	.451	-.1349	.1728	-.5152	.2454
	Equal variances not assumed			-.834	7.552	.430	-.1349	.1617	-.5116	.2418
SUPPNUM	Equal variances assumed	1.506	.245	-2.082	11	.061	-1.1190	.5374	-2.3018	6.367E-02
	Equal variances not assumed			-2.148	10.519	.056	-1.1190	.5209	-2.2719	3.382E-02
SUPPLIER	Equal variances assumed	3.383	.093	-1.581	11	.142	-.2738	.1732	-.6549	.1073
	Equal variances not assumed			-1.656	9.463	.131	-.2738	.1654	-.6452	9.755E-02
SUPPORT	Equal variances assumed	.106	.751	.238	11	.817	2.381E-02	.1002	-.1968	.2445
	Equal variances not assumed			.237	10.606	.817	2.381E-02	.1005	-.1983	.2459
INCENTIV	Equal variances assumed	.093	.766	-.535	11	.604	-.1587	.2969	-.8122	.4947
	Equal variances not assumed			-.528	10.039	.609	-.1587	.3005	-.8278	.5104
ORGANIZE	Equal variances assumed	.621	.447	-.344	11	.738	-.1190	.3463	-.8812	.6432
	Equal variances not assumed			-.332	8.348	.748	-.1190	.3584	-.9396	.7015
SHAREINF	Equal variances assumed	.556	.471	-.575	11	.577	-.2143	.3724	-1.0339	.6054
	Equal variances not assumed			-.591	10.758	.567	-.2143	.3628	-1.0150	.5865
CROSSFUN	Equal variances assumed	.157	.700	.504	11	.624	7.143E-02	.1418	-.2406	.3835
	Equal variances not assumed			.484	7.912	.641	7.143E-02	.1475	-.2695	.4123
STRATEGY	Equal variances assumed	2.031	.182	.000	11	1.000	.0000	.2372	-.5221	.5221
	Equal variances not assumed			.000	6.000	1.000	.0000	.2182	-.5340	.5340
MANAGERS	Equal variances assumed	1.142	.308	-.746	11	.471	-.2143	.2871	-.8461	.4175
	Equal variances not assumed			-.739	10.188	.476	-.2143	.2899	-.8585	.4299

Figure 15 : Analysis of Means between Small Firm and Large Firm Groups

Group Statistics					
	SIZE	N	Mean	Std. Deviation	Std. Error Mean
INTEGRAT	1.00	6	3.7222	.3897	.1591
	3.00	41	3.6829	.3245	5.067E-02
PACKAGE	1.00	6	1.3333	.5164	.2108
	3.00	41	2.0976	1.3749	.2147
MAXIMIZE	1.00	6	4.0000	1.6733	.6831
	3.00	41	4.2927	1.1671	.1823
COSTINFO	1.00	6	1.1667	.4082	.1667
	3.00	41	2.7561	1.3925	.2175
MINIMIZE	1.00	6	3.3333	.5164	.2108
	3.00	41	3.1463	.3578	5.589E-02
CONTROL	1.00	6	3.0000	.3162	.1291
	3.00	41	3.2073	.6980	.1090
QUALITY	1.00	6	1.4444	.2722	.1111
	3.00	41	2.2439	.7342	.1147
INVOLVE	1.00	6	1.5556	.1361	5.556E-02
	3.00	41	2.1626	.4158	6.494E-02
SUPPNUM	1.00	6	2.1667	.7528	.3073
	3.00	41	3.3902	1.1593	.1810
SUPPLIER	1.00	6	2.0833	.2041	8.333E-02
	3.00	41	2.2317	.7913	.1236
SUPPORT	1.00	6	1.1667	.1826	7.454E-02
	3.00	41	1.4634	.6396	9.988E-02
INCENTIV	1.00	6	2.5556	.5741	.2344
	3.00	41	3.1260	.8888	.1388
ORGANIZE	1.00	6	2.1667	.7528	.3073
	3.00	41	3.0244	.7902	.1234
SHAREINF	1.00	6	2.5000	.5477	.2236
	3.00	41	4.1463	.8533	.1333
CROSSFUN	1.00	6	2.0000	.3162	.1291
	3.00	41	2.0854	.5579	8.713E-02
STRATEGY	1.00	6	4.0000	.0000	.0000
	3.00	41	3.6585	.5296	8.271E-02
MANAGERS	1.00	6	4.5000	.5477	.2236
	3.00	41	3.8537	.6543	.1022

Figure 16 : T-Tests between Small Firm and Large Firm Groups

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
INTEGRAT	Equal variances assumed	.412	.524	.270	45	.788	3.930E-02	.1453	-.2533	.3319
	Equal variances not assumed			.235	6.058	.822	3.930E-02	.1670	-.3683	.4469
PACKAGE	Equal variances assumed	8.158	.006	-1.337	45	.188	-.7642	.5716	-1.9154	.3869
	Equal variances not assumed			-2.540	18.293	.020	-.7642	.3009	-1.3957	-.1328
MAXIMIZE	Equal variances assumed	1.911	.174	-.543	45	.590	-.2927	.5392	-1.3788	.7934
	Equal variances not assumed			-.414	5.734	.694	-.2927	.7070	-2.0424	1.4570
COSTINFO	Equal variances assumed	8.308	.006	-2.755	45	.008	-1.5894	.5769	-2.7514	-.4274
	Equal variances not assumed			-5.801	26.806	.000	-1.5894	.2740	-2.1518	-1.0271
MINIMIZE	Equal variances assumed	3.290	.076	1.130	45	.265	.1870	.1656	-.1464	.5204
	Equal variances not assumed			.857	5.724	.426	.1870	.2181	-.3530	.7270
CONTROL	Equal variances assumed	5.482	.024	-.712	45	.480	-.2073	.2913	-.7940	.3794
	Equal variances not assumed			-1.227	13.795	.240	-.2073	.1690	-.5702	.1556
QUALITY	Equal variances assumed	4.383	.042	-2.620	45	.012	-.7995	.3051	-1.4141	-.1849
	Equal variances not assumed			-5.007	18.672	.000	-.7995	.1597	-1.1340	-.4649
INVOLVE	Equal variances assumed	1.587	.214	-3.519	45	.001	-.6070	.1725	-.9545	-.2596
	Equal variances not assumed			-7.103	22.700	.000	-.6070	8.546E-02	-.7840	-.4301
SUPPNUM	Equal variances assumed	1.965	.168	-2.496	45	.016	-1.2236	.4902	-2.2108	-.2363
	Equal variances not assumed			-3.430	8.938	.008	-1.2236	.3567	-2.0313	-.4159
SUPPLIER	Equal variances assumed	5.610	.022	-.453	45	.653	-.1484	.3275	-.8079	.5112
	Equal variances not assumed			-.995	31.895	.327	-.1484	.1491	-.4520	.1553
SUPPORT	Equal variances assumed	.877	.354	-1.120	45	.269	-.2967	.2649	-.8303	.2368
	Equal variances not assumed			-2.381	27.854	.024	-.2967	.1246	-.5521	-4.14E-02
INCENTIV	Equal variances assumed	2.345	.133	-1.518	45	.136	-.5705	.3757	-1.3272	.1863
	Equal variances not assumed			-2.094	8.984	.066	-.5705	.2724	-1.1869	4.594E-02
ORGANIZE	Equal variances assumed	.005	.947	-2.496	45	.016	-.8577	.3436	-1.5498	-.1657
	Equal variances not assumed			-2.590	6.721	.037	-.8577	.3312	-1.6475	-6.80E-02
SHAREINF	Equal variances assumed	.596	.444	-4.566	45	.000	-1.6463	.3606	-2.3726	-.9201
	Equal variances not assumed			-6.325	9.040	.000	-1.6463	.2603	-2.2348	-1.0579
CROSSFUN	Equal variances assumed	.652	.424	-.364	45	.718	-8.537E-02	.2345	-.5577	.3869
	Equal variances not assumed			-.548	10.325	.595	-8.537E-02	.1558	-.4309	.2602
STRATEGY	Equal variances assumed	22.263	.000	1.565	45	.125	.3415	.2183	-9.81E-02	.7810
	Equal variances not assumed			4.128	40.000	.000	.3415	8.271E-02	.1743	.5086
MANAGERS	Equal variances assumed	.035	.853	2.299	45	.026	.6463	.2812	8.001E-02	1.2127
	Equal variances not assumed			2.629	7.266	.033	.6463	.2458	6.930E-02	1.2234

Figure 17 : Analysis of Means between Medium Firm and Large Firm Groups

Group Statistics					
	SIZE	N	Mean	Std. Deviation	Std. Error Mean
INTEGRAT	2.00	7	3.8095	.4658	.1760
	3.00	41	3.6829	.3245	5.067E-02
PACKAGE	2.00	7	2.5714	1.2724	.4809
	3.00	41	2.0976	1.3749	.2147
MAXIMIZE	2.00	7	4.8571	.3780	.1429
	3.00	41	4.2927	1.1671	.1823
COSTINFO	2.00	7	1.8571	1.2150	.4592
	3.00	41	2.7561	1.3925	.2175
MINIMIZE	2.00	7	3.7143	.9512	.3595
	3.00	41	3.1463	.3578	5.589E-02
CONTROL	2.00	7	2.8571	.6268	.2369
	3.00	41	3.2073	.6980	.1090
QUALITY	2.00	7	1.8571	.6901	.2608
	3.00	41	2.2439	.7342	.1147
INVOLVE	2.00	7	1.6905	.4017	.1518
	3.00	41	2.1626	.4158	6.494E-02
SUPPNUM	2.00	7	3.2857	1.1127	.4206
	3.00	41	3.3902	1.1593	.1810
SUPPLIER	2.00	7	2.3571	.3780	.1429
	3.00	41	2.2317	.7913	.1236
SUPPORT	2.00	7	1.1429	.1782	6.734E-02
	3.00	41	1.4634	.6396	9.988E-02
INCENTIV	2.00	7	2.7143	.4973	.1880
	3.00	41	3.1260	.8888	.1388
ORGANIZE	2.00	7	2.2857	.4880	.1844
	3.00	41	3.0244	.7902	.1234
SHAREINF	2.00	7	2.7143	.7559	.2857
	3.00	41	4.1463	.8533	.1333
CROSSFUN	2.00	7	1.9286	.1890	7.143E-02
	3.00	41	2.0854	.5579	8.713E-02
STRATEGY	2.00	7	4.0000	.5774	.2182
	3.00	41	3.6585	.5296	8.271E-02
MANAGERS	2.00	7	4.7143	.4880	.1844
	3.00	41	3.8537	.6543	.1022

Figure 18 : T-Tests between Medium Firm and Large Firm Groups

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
INTEGRAT	Equal variances assumed	1.643	.206	.894	46	.376	.1266	.1416	-.1584	.4116
	Equal variances not assumed			.691	7.028	.512	.1266	.1832	-.3062	.5594
PACKAGE	Equal variances assumed	.297	.588	.851	46	.399	.4739	.5570	-.6473	1.5950
	Equal variances not assumed			.900	8.579	.393	.4739	.5267	-.7265	1.6743
MAXIMIZE	Equal variances assumed	4.297	.044	1.258	46	.215	.5645	.4486	-.3385	1.4674
	Equal variances not assumed			2.437	29.650	.021	.5645	.2316	9.126E-02	1.0377
COSTINFO	Equal variances assumed	.392	.534	-1.604	46	.116	-.8990	.5605	-2.0273	.2293
	Equal variances not assumed			-1.769	8.926	.111	-.8990	.5081	-2.0498	.2519
MINIMIZE	Equal variances assumed	26.533	.000	2.900	46	.006	.5679	.1959	.1737	.9622
	Equal variances not assumed			1.561	6.293	.167	.5679	.3638	-.3124	1.4483
CONTROL	Equal variances assumed	.007	.934	-1.243	46	.220	-.3502	.2818	-.9175	.2171
	Equal variances not assumed			-1.343	8.751	.213	-.3502	.2608	-.9427	.2423
QUALITY	Equal variances assumed	.018	.893	-1.298	46	.201	-.3868	.2980	-.9865	.2130
	Equal variances not assumed			-1.357	8.496	.210	-.3868	.2849	-1.0372	.2636
INVOLVE	Equal variances assumed	.455	.503	-2.789	46	.008	-.4721	.1693	-.8129	-.1313
	Equal variances not assumed			-2.859	8.354	.020	-.4721	.1651	-.8501	-9.41E-02
SUPPNUM	Equal variances assumed	.032	.860	-.222	46	.826	-.1045	.4717	-1.0539	.8449
	Equal variances not assumed			-.228	8.387	.825	-.1045	.4579	-1.1520	.9429
SUPPLIER	Equal variances assumed	2.734	.105	.409	46	.685	.1254	.3069	-.4923	.7432
	Equal variances not assumed			.664	16.920	.516	.1254	.1889	-.2732	.5241
SUPPORT	Equal variances assumed	1.059	.309	-1.307	46	.198	-.3206	.2453	-.8144	.1732
	Equal variances not assumed			-2.661	35.596	.012	-.3206	.1205	-.5650	-7.61E-02
INCENTIV	Equal variances assumed	3.867	.055	-1.187	46	.241	-.4117	.3468	-1.1098	.2864
	Equal variances not assumed			-1.762	13.715	.100	-.4117	.2337	-.9139	9.043E-02
ORGANIZE	Equal variances assumed	.615	.437	-2.384	46	.021	-.7387	.3098	-1.3624	-.1150
	Equal variances not assumed			-3.329	12.208	.006	-.7387	.2219	-1.2213	-.2561
SHAREINF	Equal variances assumed	.068	.795	-4.163	46	.000	-1.4321	.3440	-2.1245	-.7396
	Equal variances not assumed			-4.542	8.832	.001	-1.4321	.3153	-2.1473	-.7168
CROSSFUN	Equal variances assumed	1.295	.261	-.731	46	.469	-.1568	.2146	-.5887	.2752
	Equal variances not assumed			-1.392	27.882	.175	-.1568	.1127	-.3876	7.404E-02
STRATEGY	Equal variances assumed	2.407	.128	1.558	46	.126	.3415	.2192	-9.98E-02	.7828
	Equal variances not assumed			1.463	7.824	.182	.3415	.2334	-.1988	.8817
MANAGERS	Equal variances assumed	.105	.747	3.314	46	.002	.8606	.2597	.3379	1.3834
	Equal variances not assumed			4.082	10.106	.002	.8606	.2108	.3915	1.3297

APPENDIX C

Figure 19 : ANOVA Tests for Firm Groups Divided Based on Ownership Type

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
INTEGRAT	Between Groups	1.235E-02	2	6.173E-03	.050	.952
	Within Groups	6.358	51	.125		
	Total	6.370	53			
PACKAGE	Between Groups	6.704	2	3.352	2.011	.144
	Within Groups	85.000	51	1.667		
	Total	91.704	53			
MAXIMIZE	Between Groups	16.778	2	8.389	7.747	.001
	Within Groups	55.222	51	1.083		
	Total	72.000	53			
COSTINFO	Between Groups	40.704	2	20.352	16.548	.000
	Within Groups	62.722	51	1.230		
	Total	103.426	53			
MINIMIZE	Between Groups	.481	2	.241	.917	.406
	Within Groups	13.389	51	.263		
	Total	13.870	53			
CONTROL	Between Groups	1.778	2	.889	2.115	.131
	Within Groups	21.431	51	.420		
	Total	23.208	53			
QUALITY	Between Groups	11.128	2	5.564	16.214	.000
	Within Groups	17.500	51	.343		
	Total	28.628	53			
INVOLVE	Between Groups	4.038	2	2.019	15.106	.000
	Within Groups	6.816	51	.134		
	Total	10.854	53			
SUPPNUM	Between Groups	15.815	2	7.907	7.194	.002
	Within Groups	56.056	51	1.099		
	Total	71.870	53			
SUPPLIER	Between Groups	1.454	2	.727	1.489	.235
	Within Groups	24.903	51	.488		
	Total	26.356	53			
SUPPORT	Between Groups	2.926	2	1.463	5.062	.010
	Within Groups	14.741	51	.289		
	Total	17.667	53			
INCENTIV	Between Groups	16.762	2	8.381	20.982	.000
	Within Groups	20.372	51	.399		
	Total	37.134	53			
ORGANIZE	Between Groups	16.444	2	8.222	22.006	.000
	Within Groups	19.056	51	.374		
	Total	35.500	53			
SHAREINF	Between Groups	24.111	2	12.056	18.507	.000
	Within Groups	33.222	51	.651		
	Total	57.333	53			
CROSSFUN	Between Groups	1.750	2	.875	3.853	.028
	Within Groups	11.583	51	.227		
	Total	13.333	53			
STRATEGY	Between Groups	4.593	2	2.296	11.977	.000
	Within Groups	9.778	51	.192		
	Total	14.370	53			
MANAGERS	Between Groups	10.037	2	5.019	16.108	.000
	Within Groups	15.889	51	.312		
	Total	25.926	53			

Figure 20 : Test of Normality

Tests of Normality ^a							
TYPE		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
INTEGRAT	1.00	.173	18	.164	.925	18	.201
	2.00	.222	18	.019	.929	18	.246
	3.00	.305	18	.000	.840	18	.010**
PACKAGE	1.00	.418	18	.000	.570	18	.010**
	2.00	.292	18	.000	.769	18	.010**
	3.00	.219	18	.023	.806	18	.010**
MAXIMIZE	1.00	.289	18	.000	.822	18	.010**
	2.00	.480	18	.000	.447	18	.010**
	3.00	.501	18	.000	.456	18	.010**
COSTINFO	1.00	.195	18	.070	.916	18	.118
	2.00	.435	18	.000	.614	18	.010**
	3.00	.245	18	.006	.818	18	.010**
MINIMIZE	1.00	.523	18	.000	.371	18	.010**
	2.00	.463	18	.000	.552	18	.010**
	3.00	.435	18	.000	.614	18	.010**
CONTROL	1.00	.180	18	.126	.898	18	.052
	2.00	.197	18	.062	.946	18	.407
	3.00	.225	18	.016	.886	18	.035
QUALITY	1.00	.175	18	.148	.941	18	.353
	2.00	.449	18	.000	.528	18	.010**
	3.00	.234	18	.010	.880	18	.028
INVOLVE	1.00	.309	18	.000	.655	18	.010**
	2.00	.196	18	.067	.909	18	.085
	3.00	.264	18	.002	.892	18	.044
SUPPNUM	1.00	.184	18	.108	.921	18	.169
	2.00	.275	18	.001	.869	18	.017
	3.00	.279	18	.001	.806	18	.010**
SUPPLIER	1.00	.223	18	.018	.896	18	.048
	2.00	.276	18	.001	.788	18	.010**
	3.00	.230	18	.013	.849	18	.010**
SUPPORT	1.00	.294	18	.000	.726	18	.010**
	2.00	.363	18	.000	.639	18	.010**
	3.00	.382	18	.000	.735	18	.010**
INCENTIV	1.00	.158	18	.200*	.939	18	.337
	2.00	.252	18	.004	.848	18	.010**
	3.00	.215	18	.028	.909	18	.086
ORGANIZE	1.00	.260	18	.002	.844	18	.010**
	2.00	.294	18	.000	.753	18	.010**
	3.00	.392	18	.000	.625	18	.010**
SHAREINF	1.00	.276	18	.001	.788	18	.010**
	2.00	.260	18	.002	.807	18	.010**
	3.00	.296	18	.000	.725	18	.010**
CROSSFUN	1.00	.380	18	.000	.721	18	.010**
	2.00	.442	18	.000	.575	18	.010**
	3.00	.436	18	.000	.683	18	.010**
STRATEGY	1.00	.324	18	.000	.752	18	.010**
	2.00	.444	18	.000	.478	18	.010**
	3.00	.523	18	.000	.371	18	.010**
MANAGERS	1.00	.346	18	.000	.727	18	.010**
	2.00	.363	18	.000	.639	18	.010**
	3.00	.374	18	.000	.715	18	.010**

** . This is an upper bound of the true significance.

* . This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 21 : Homogeneity of Variances for MANOVA**Box's Test of Equality of Covariance Matrices^a**

Box's M	1120.127
F	1.827
df1	306
df2	6807.886
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept+TYPE

Figure 22 : Test of Homogeneity of Variances**Test of Homogeneity of Variances**

	Levene Statistic	df1	df2	Sig.
INTEGRAT	1.839	2	51	.169
PACKAGE	.428	2	51	.654
MAXIMIZE	7.769	2	51	.001
COSTINFO	13.116	2	51	.000
MINIMIZE	4.100	2	51	.022
CONTROL	1.191	2	51	.312
QUALITY	4.255	2	51	.020
INVOLVE	.556	2	51	.577
SUPPNUM	1.562	2	51	.220
SUPPLIER	5.957	2	51	.005
SUPPORT	13.158	2	51	.000
INCENTIV	4.166	2	51	.021
ORGANIZE	1.432	2	51	.248
SHAREINF	.372	2	51	.691
CROSSFUN	13.398	2	51	.000
STRATEGY	10.539	2	51	.000
MANAGERS	3.450	2	51	.039

Figure 23 : Analysis of Means between State-owned and Private Companies**Group Statistics**

	TYPE	N	Mean	Std. Deviation	Std. Error Mean
INTEGRAT	1.00	18	3.7037	.3773	8.893E-02
	2.00	18	3.7222	.4002	9.432E-02
PACKAGE	1.00	18	1.7222	1.4061	.3314
	2.00	18	1.9444	1.1618	.2738
MAXIMIZE	1.00	18	3.5556	1.4234	.3355
	2.00	18	4.6111	1.0369	.2444
COSTINFO	1.00	18	2.6111	1.0922	.2574
	2.00	18	1.3333	.5941	.1400
MINIMIZE	1.00	18	3.1111	.3234	7.622E-02
	2.00	18	3.2778	.5745	.1354
CONTROL	1.00	18	2.9167	.7906	.1863
	2.00	18	3.1389	.6372	.1502
QUALITY	1.00	18	2.6481	.8438	.1989
	2.00	18	1.5370	.4593	.1083
INVOLVE	1.00	18	2.2037	.4699	.1107
	2.00	18	1.6481	.2549	6.009E-02
SUPPNUM	1.00	18	2.9444	1.2590	.2967
	2.00	18	2.7778	.8085	.1906
SUPPLIER	1.00	18	2.3333	.5688	.1341
	2.00	18	2.3611	.3760	8.861E-02
SUPPORT	1.00	18	1.7037	.9031	.2129
	2.00	18	1.1481	.1704	4.017E-02
INCENTIV	1.00	18	2.5833	.7054	.1663
	2.00	18	2.6481	.4235	9.983E-02
ORGANIZE	1.00	18	2.5000	.7071	.1667
	2.00	18	2.3889	.6077	.1432
SHAREINF	1.00	18	4.2778	.7519	.1772
	2.00	18	2.8333	.7071	.1667
CROSSFUN	1.00	18	1.8889	.2742	6.462E-02
	2.00	18	1.9722	.2081	4.905E-02
STRATEGY	1.00	18	3.3333	.5941	.1400
	2.00	18	4.0000	.3430	8.085E-02
MANAGERS	1.00	18	3.5000	.6183	.1457
	2.00	18	4.5556	.5113	.1205

Figure 24 : T-tests between State-owned and Private Companies

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
INTEGRAT	Equal variances assumed	.011	.917	-.143	34	.887	-1.852E-02	.1296	-.2820	.2449
	Equal variances not assumed			-.143	33.883	.887	-1.852E-02	.1296	-.2820	.2450
PACKAGE	Equal variances assumed	.143	.708	-.517	34	.609	-.2222	.4299	-1.0959	.6515
	Equal variances not assumed			-.517	32.832	.609	-.2222	.4299	-1.0970	.6526
MAXIMIZE	Equal variances assumed	3.569	.067	-2.543	34	.016	-1.0556	.4151	-1.8991	-.2120
	Equal variances not assumed			-2.543	31.078	.016	-1.0556	.4151	-1.9020	-.2091
COSTINFO	Equal variances assumed	5.771	.022	4.360	34	.000	1.2778	.2930	.6822	1.8733
	Equal variances not assumed			4.360	26.250	.000	1.2778	.2930	.6757	1.8799
MINIMIZE	Equal variances assumed	5.062	.031	-1.073	34	.291	-.1667	.1554	-.4825	.1491
	Equal variances not assumed			-1.073	26.790	.293	-.1667	.1554	-.4856	.1523
CONTROL	Equal variances assumed	.369	.548	-.929	34	.360	-.2222	.2393	-.7086	.2642
	Equal variances not assumed			-.929	32.533	.360	-.2222	.2393	-.7094	.2650
QUALITY	Equal variances assumed	3.931	.056	4.907	34	.000	1.1111	.2264	.6509	1.5713
	Equal variances not assumed			4.907	26.261	.000	1.1111	.2264	.6459	1.5764
INVOLVE	Equal variances assumed	.859	.361	4.409	34	.000	.5556	.1260	.2995	.8116
	Equal variances not assumed			4.409	26.211	.000	.5556	.1260	.2967	.8144
SUPPNUM	Equal variances assumed	2.390	.131	.473	34	.640	.1667	.3527	-.5500	.8833
	Equal variances not assumed			.473	28.983	.640	.1667	.3527	-.5546	.8879
SUPPLIER	Equal variances assumed	1.871	.180	-.173	34	.864	-2.778E-02	.1607	-.3544	.2988
	Equal variances not assumed			-.173	29.473	.864	-2.778E-02	.1607	-.3562	.3007
SUPPORT	Equal variances assumed	11.526	.002	2.565	34	.015	.5556	.2166	.1153	.9958
	Equal variances not assumed			2.565	18.210	.019	.5556	.2166	.1008	1.0103
INCENTIV	Equal variances assumed	4.101	.051	-.334	34	.740	-6.481E-02	.1939	-.4589	.3293
	Equal variances not assumed			-.334	27.848	.741	-6.481E-02	.1939	-.4622	.3325
ORGANIZE	Equal variances assumed	.514	.478	.506	34	.616	.1111	.2198	-.3355	.5577
	Equal variances not assumed			.506	33.248	.616	.1111	.2198	-.3359	.5581
SHAREINF	Equal variances assumed	.445	.509	5.937	34	.000	1.4444	.2433	.9500	1.9389
	Equal variances not assumed			5.937	33.873	.000	1.4444	.2433	.9500	1.9389
CROSSFUN	Equal variances assumed	3.873	.057	-1.027	34	.312	-8.333E-02	8.113E-02	-.2482	8.153E-02
	Equal variances not assumed			-1.027	31.706	.312	-8.333E-02	8.113E-02	-.2486	8.197E-02
STRATEGY	Equal variances assumed	17.286	.000	-4.123	34	.000	-.6667	.1617	-.9953	-.3381
	Equal variances not assumed			-4.123	27.200	.000	-.6667	.1617	-.9983	-.3350
MANAGERS	Equal variances assumed	1.167	.288	-5.581	34	.000	-1.0556	.1891	-1.4399	-.6712
	Equal variances not assumed			-5.581	32.842	.000	-1.0556	.1891	-1.4404	-.6707

Figure 25 : Analysis of Means between State-owned and Foreign-invested Firms**Group Statistics**

	TYPE	N	Mean	Std. Deviation	Std. Error Mean
INTEGRAT	1.00	18	3.7037	.3773	8.893E-02
	3.00	18	3.6852	.2675	6.304E-02
PACKAGE	1.00	18	1.7222	1.4061	.3314
	3.00	18	2.5556	1.2935	.3049
MAXIMIZE	1.00	18	3.5556	1.4234	.3355
	3.00	18	4.8333	.3835	9.039E-02
COSTINFO	1.00	18	2.6111	1.0922	.2574
	3.00	18	3.4444	1.4642	.3451
MINIMIZE	1.00	18	3.1111	.3234	7.622E-02
	3.00	18	3.3333	.5941	.1400
CONTROL	1.00	18	2.9167	.7906	.1863
	3.00	18	3.3611	.4791	.1129
QUALITY	1.00	18	2.6481	.8438	.1989
	3.00	18	2.1296	.3262	7.688E-02
INVOLVE	1.00	18	2.2037	.4699	.1107
	3.00	18	2.2500	.3394	8.000E-02
SUPPNUM	1.00	18	2.9444	1.2590	.2967
	3.00	18	4.0000	1.0290	.2425
SUPPLIER	1.00	18	2.3333	.5688	.1341
	3.00	18	2.0000	1.0000	.2357
SUPPORT	1.00	18	1.7037	.9031	.2129
	3.00	18	1.3148	.1500	3.537E-02
INCENTIV	1.00	18	2.5833	.7054	.1663
	3.00	18	3.7963	.7221	.1702
ORGANIZE	1.00	18	2.5000	.7071	.1667
	3.00	18	3.6111	.5016	.1182
SHAREINF	1.00	18	4.2778	.7519	.1772
	3.00	18	4.2222	.9428	.2222
CROSSFUN	1.00	18	1.8889	.2742	6.462E-02
	3.00	18	2.3056	.7503	.1768
STRATEGY	1.00	18	3.3333	.5941	.1400
	3.00	18	3.8889	.3234	7.622E-02
MANAGERS	1.00	18	3.5000	.6183	.1457
	3.00	18	4.0556	.5393	.1271

Figure 26 : T-tests between State-owned and Foreign-invested Firms

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
INTEGRAT	Equal variances assumed	3.550	.068	.170	34	.866	1.852E-02	.1090	-.2030	.2400
	Equal variances not assumed			.170	30.641	.866	1.852E-02	.1090	-.2039	.2409
PACKAGE	Equal variances assumed	.231	.634	-1.851	34	.073	-.8333	.4503	-1.7485	8.184E-02
	Equal variances not assumed			-1.851	33.766	.073	-.8333	.4503	-1.7487	8.208E-02
MAXIMIZE	Equal variances assumed	19.600	.000	-3.677	34	.001	-1.2778	.3475	-1.9839	-.5716
	Equal variances not assumed			-3.677	19.455	.002	-1.2778	.3475	-2.0039	-.5517
COSTINFO	Equal variances assumed	5.862	.021	-1.936	34	.061	-.8333	.4305	-1.7083	4.163E-02
	Equal variances not assumed			-1.936	31.446	.062	-.8333	.4305	-1.7109	4.426E-02
MINIMIZE	Equal variances assumed	8.500	.006	-1.394	34	.172	-.2222	.1594	-.5462	.1018
	Equal variances not assumed			-1.394	26.261	.175	-.2222	.1594	-.5498	.1053
CONTROL	Equal variances assumed	2.263	.142	-2.040	34	.049	-.4444	.2179	-.8873	-1.64E-03
	Equal variances not assumed			-2.040	28.004	.051	-.4444	.2179	-.8908	1.882E-03
QUALITY	Equal variances assumed	6.225	.018	2.432	34	.020	.5185	.2132	8.517E-02	.9519
	Equal variances not assumed			2.432	21.969	.024	.5185	.2132	7.626E-02	.9608
INVOLVE	Equal variances assumed	.042	.839	-.339	34	.737	-4.630E-02	.1366	-.3239	.2313
	Equal variances not assumed			-.339	30.944	.737	-4.630E-02	.1366	-.3250	.2324
SUPPNUM	Equal variances assumed	.120	.732	-2.754	34	.009	-1.0556	.3832	-1.8344	-.2767
	Equal variances not assumed			-2.754	32.705	.010	-1.0556	.3832	-1.8355	-.2756
SUPPLIER	Equal variances assumed	4.221	.048	1.229	34	.227	.3333	.2712	-.2177	.8844
	Equal variances not assumed			1.229	26.958	.230	.3333	.2712	-.2231	.8898
SUPPORT	Equal variances assumed	14.957	.000	1.802	34	.080	.3889	.2158	-4.96E-02	.8274
	Equal variances not assumed			1.802	17.938	.088	.3889	.2158	-6.45E-02	.8423
INCENTIV	Equal variances assumed	.391	.536	-5.098	34	.000	-1.2130	.2379	-1.6965	-.7294
	Equal variances not assumed			-5.098	33.981	.000	-1.2130	.2379	-1.6965	-.7294
ORGANIZE	Equal variances assumed	2.837	.101	-5.437	34	.000	-1.1111	.2043	-1.5264	-.6958
	Equal variances not assumed			-5.437	30.653	.000	-1.1111	.2043	-1.5281	-.6942
SHAREINF	Equal variances assumed	.086	.771	.195	34	.846	5.556E-02	.2842	-.5221	.6332
	Equal variances not assumed			.195	32.397	.846	5.556E-02	.2842	-.5231	.6343
CROSSFUN	Equal variances assumed	10.997	.002	-2.213	34	.034	-.4167	.1883	-.7993	-3.40E-02
	Equal variances not assumed			-2.213	21.460	.038	-.4167	.1883	-.8077	-2.56E-02
STRATEGY	Equal variances assumed	14.101	.001	-3.485	34	.001	-.5556	.1594	-.8796	-.2316
	Equal variances not assumed			-3.485	26.261	.002	-.5556	.1594	-.8831	-.2280
MANAGERS	Equal variances assumed	4.320	.045	-2.873	34	.007	-.5556	.1934	-.9486	-.1625
	Equal variances not assumed			-2.873	33.383	.007	-.5556	.1934	-.9488	-.1623

Figure 27 : Analysis of Means between Private and Foreign-invested Firms**Group Statistics**

	TYPE	N	Mean	Std. Deviation	Std. Error Mean
INTEGRAT	2.00	18	3.7222	.4002	9.432E-02
	3.00	18	3.6852	.2675	6.304E-02
PACKAGE	2.00	18	1.9444	1.1618	.2738
	3.00	18	2.5556	1.2935	.3049
MAXIMIZE	2.00	18	4.6111	1.0369	.2444
	3.00	18	4.8333	.3835	9.039E-02
COSTINFO	2.00	18	1.3333	.5941	.1400
	3.00	18	3.4444	1.4642	.3451
MINIMIZE	2.00	18	3.2778	.5745	.1354
	3.00	18	3.3333	.5941	.1400
CONTROL	2.00	18	3.1389	.6372	.1502
	3.00	18	3.3611	.4791	.1129
QUALITY	2.00	18	1.5370	.4593	.1083
	3.00	18	2.1296	.3262	7.688E-02
INVOLVE	2.00	18	1.6481	.2549	6.009E-02
	3.00	18	2.2500	.3394	8.000E-02
SUPPNUM	2.00	18	2.7778	.8085	.1906
	3.00	18	4.0000	1.0290	.2425
SUPPLIER	2.00	18	2.3611	.3760	8.861E-02
	3.00	18	2.0000	1.0000	.2357
SUPPORT	2.00	18	1.1481	.1704	4.017E-02
	3.00	18	1.3148	.1500	3.537E-02
INCENTIV	2.00	18	2.6481	.4235	9.983E-02
	3.00	18	3.7963	.7221	.1702
ORGANIZE	2.00	18	2.3889	.6077	.1432
	3.00	18	3.6111	.5016	.1182
SHAREINF	2.00	18	2.8333	.7071	.1667
	3.00	18	4.2222	.9428	.2222
CROSSFUN	2.00	18	1.9722	.2081	4.905E-02
	3.00	18	2.3056	.7503	.1768
STRATEGY	2.00	18	4.0000	.3430	8.085E-02
	3.00	18	3.8889	.3234	7.622E-02
MANAGERS	2.00	18	4.5556	.5113	.1205
	3.00	18	4.0556	.5393	.1271

Figure 28 : T-tests between Private and Foreign-invested Firms

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
INTEGRAT	Equal variances assumed	2.429	.128	.326	34	.746	3.704E-02	.1134	-.1935	.2676
	Equal variances not assumed			.326	29.662	.746	3.704E-02	.1134	-.1948	.2688
PACKAGE	Equal variances assumed	1.288	.264	-1.491	34	.145	-.6111	.4098	-1.4439	.2217
	Equal variances not assumed			-1.491	33.615	.145	-.6111	.4098	-1.4443	.2221
MAXIMIZE	Equal variances assumed	3.549	.068	-.853	34	.400	-.2222	.2606	-.7518	.3073
	Equal variances not assumed			-.853	21.565	.403	-.2222	.2606	-.7633	.3188
COSTINFO	Equal variances assumed	35.406	.000	-5.668	34	.000	-2.1111	.3724	-2.8680	-1.3542
	Equal variances not assumed			-5.668	22.450	.000	-2.1111	.3724	-2.8826	-1.3396
MINIMIZE	Equal variances assumed	.183	.671	-.285	34	.777	-5.556E-02	.1948	-.4514	.3403
	Equal variances not assumed			-.285	33.962	.777	-5.556E-02	.1948	-.4514	.3403
CONTROL	Equal variances assumed	1.084	.305	-1.183	34	.245	-.2222	.1879	-.6041	.1597
	Equal variances not assumed			-1.183	31.567	.246	-.2222	.1879	-.6052	.1608
QUALITY	Equal variances assumed	.213	.648	-4.463	34	.000	-.5926	.1328	-.8624	-.3227
	Equal variances not assumed			-4.463	30.670	.000	-.5926	.1328	-.8635	-.3217
INVOLVE	Equal variances assumed	1.181	.285	-6.015	34	.000	-.6019	.1001	-.8052	-.3985
	Equal variances not assumed			-6.015	31.551	.000	-.6019	.1001	-.8058	-.3979
SUPPNUM	Equal variances assumed	2.653	.113	-3.963	34	.000	-1.2222	.3084	-1.8490	-.5954
	Equal variances not assumed			-3.963	32.197	.000	-1.2222	.3084	-1.8503	-.5941
SUPPLIER	Equal variances assumed	9.588	.004	1.434	34	.161	.3611	.2518	-.1506	.8728
	Equal variances not assumed			1.434	21.711	.166	.3611	.2518	-.1615	.8837
SUPPORT	Equal variances assumed	7.354	.010	-3.114	34	.004	-.1667	5.352E-02	-.2754	-5.79E-02
	Equal variances not assumed			-3.114	33.462	.004	-.1667	5.352E-02	-.2755	-5.78E-02
INCENTIV	Equal variances assumed	9.963	.003	-5.819	34	.000	-1.1481	.1973	-1.5491	-.7472
	Equal variances not assumed			-5.819	27.459	.000	-1.1481	.1973	-1.5527	-.7436
ORGANIZE	Equal variances assumed	1.198	.281	-6.581	34	.000	-1.2222	.1857	-1.5997	-.8448
	Equal variances not assumed			-6.581	32.822	.000	-1.2222	.1857	-1.6002	-.8443
SHAREINF	Equal variances assumed	.597	.445	-5.000	34	.000	-1.3889	.2778	-1.9534	-.8244
	Equal variances not assumed			-5.000	31.528	.000	-1.3889	.2778	-1.9550	-.8227
CROSSFUN	Equal variances assumed	18.109	.000	-1.816	34	.078	-.3333	.1835	-.7063	3.962E-02
	Equal variances not assumed			-1.816	19.600	.085	-.3333	.1835	-.7166	4.998E-02
STRATEGY	Equal variances assumed	.801	.377	1.000	34	.324	.1111	.1111	-.1147	.3369
	Equal variances not assumed			1.000	33.883	.324	.1111	.1111	-.1147	.3369
MANAGERS	Equal variances assumed	3.050	.090	2.854	34	.007	.5000	.1752	.1440	.8560
	Equal variances not assumed			2.854	33.904	.007	.5000	.1752	.1440	.8560

APPENDIX D

Figure 29 : MANOVA Tests for Firm Groups Divided Based on Size

Multivariate Tests ^b						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.859	21.337 ^a	4.000	14.000	.000
	Wilks' Lambda	.141	21.337 ^a	4.000	14.000	.000
	Hotelling's Trace	6.096	21.337 ^a	4.000	14.000	.000
	Roy's Largest Root	6.096	21.337 ^a	4.000	14.000	.000
SIZE	Pillai's Trace	.430	2.646 ^a	4.000	14.000	.078
	Wilks' Lambda	.570	2.646 ^a	4.000	14.000	.078
	Hotelling's Trace	.756	2.646 ^a	4.000	14.000	.078
	Roy's Largest Root	.756	2.646 ^a	4.000	14.000	.078

a. Exact statistic

b. Design: Intercept+SIZE

Figure 30 : ANOVA Tests for Firm Groups Divided Based on Size

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
PROQUALI	Between Groups	2.997	1	2.997	1.697	.210
	Within Groups	30.029	17	1.766		
	Total	33.026	18			
COSTS	Between Groups	2.235	1	2.235	3.892	.065
	Within Groups	9.765	17	.574		
	Total	12.000	18			
PRODUCTI	Between Groups	2.731	1	2.731	5.124	.037
	Within Groups	9.059	17	.533		
	Total	11.789	18			
LEADTIME	Between Groups	.187	1	.187	.188	.670
	Within Groups	16.971	17	.998		
	Total	17.158	18			

Figure 31 : Tests of Homogeneity of Variances

Test of Homogeneity of Variances				
	Levene Statistic	df1	df2	Sig.
PROQUALI	1.977	1	17	.178
COSTS	3.723	1	17	.071
PRODUCTI	5.208	1	17	.036
LEADTIME	1.187	1	17	.291

Figure 32 : MANOVA Tests for Firm Groups Divided Based on Ownership Type

Multivariate Tests ^c						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.875	22.726 ^a	4.000	13.000	.000
	Wilks' Lambda	.125	22.726 ^a	4.000	13.000	.000
	Hotelling's Trace	6.993	22.726 ^a	4.000	13.000	.000
	Roy's Largest Root	6.993	22.726 ^a	4.000	13.000	.000
TYPE	Pillai's Trace	.765	2.168	8.000	28.000	.062
	Wilks' Lambda	.370	2.092 ^a	8.000	26.000	.074
	Hotelling's Trace	1.336	2.004	8.000	24.000	.090
	Roy's Largest Root	.953	3.336 ^b	4.000	14.000	.041

a. Exact statistic

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

c. Design: Intercept+TYPE

Figure 33 : ANOVA Tests for Firm Groups Divided Based on Ownership Type

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
PROQUALI	Between Groups	7.124	2	3.562	2.200	.143
	Within Groups	25.903	16	1.619		
	Total	33.026	18			
COSTS	Between Groups	1.091	2	.545	.800	.467
	Within Groups	10.909	16	.682		
	Total	12.000	18			
PRODUCTI	Between Groups	1.608	2	.804	1.263	.309
	Within Groups	10.182	16	.636		
	Total	11.789	18			
LEADTIME	Between Groups	4.898	2	2.449	3.196	.068
	Within Groups	12.260	16	.766		
	Total	17.158	18			

Figure 34 : Tests of Homogeneity of Variances**Levene's Test of Equality of Error Variances^a**

	F	df1	df2	Sig.
PROQUALI	1.133	2	16	.347
COSTS	.851	2	16	.445
PRODUCTI	1.052	2	16	.372
LEADTIME	1.075	2	16	.365

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept+TYPE

APPENDIX E

Anh Dao
MBA Program – Operations Management
Sprott School of Business
Carleton University
Tel: 688-2300 ext.6539
Email: adao@chat.carleton.ca

Date: _____

Dear Sir/Madam

I am a graduate student in the MBA program at Sprott School of Business, Carleton University. As a requirement of the program, I am writing a thesis on the adoption of Just-In-Time purchasing in Vietnam. The just-in-time concept has proven to contribute significantly to the success of Japanese manufacturing, and has been implemented successfully in other countries. My study will examine to what extent Just-In-Time purchasing is implemented in Vietnam and how it affects firm performance. The results of this study are useful for managers in Vietnam in deciding whether Just-In-Time purchasing can be implemented successfully in Vietnam.

Your answers to my questionnaire would help me greatly in completing this research. All of the questions are mainly based on perception, not actual figures. The information that you provide will be treated as strictly confidential. Neither your name nor your companies will be referred to in the final documents. The data collected will be entered into an electronic database and accessible only to me. A copy of the research report will be made available to your company once it is completed.

Should you have any question, please do not hesitate to contact me at (613) 688-2300 ext. 6539 (adao@chat.carleton.ca) or my supervisor, Dr. Vinod Kumar at (613) 520- 2379 (email: vkumar@ccs.carleton.ca).

Thank you very much for you participation.

Yours sincerely,

Student

Supervisor

Anh Dao

Vinod Kumar, Ph.D.
Director, Sprott School of Business
Carleton University

CONSENT FORM

To: Anh Dao
MBA Program – Operations Management
Sprott School of Business
Carleton University
Tel: 688-2300 ext.6539
Email: adao@chat.carleton.ca

To researcher,

My name is _____. I have been approached by Anh Dao, a graduate student in the MBA program at Sprott School of Business, Carleton University, to participate in a survey. I understand that this research is to investigate the adoption of just-in-time purchasing in Vietnam and its impact on firm performance. The results of this study are useful for managers in Vietnam in deciding whether JIT purchasing can be implemented successfully in Vietnam.

As a participant, I will be asked to answer a structure questionnaire, which will be provided in advance. The process is estimated to take an hour at most at my chosen location. I am to be guaranteed absolute anonymity and confidentiality. My name or my company name will not be referred to at any point in the final report. Furthermore, the data collected will be entered into an electronic database and accessible only to the researcher. The questions are mainly based on perception, not actual figures. In addition, I have the right to refuse to answer any particular questions during the interview or to withdraw my permission to use the data I have provided until the point this thesis is submitted to the Graduate Studies. Once the research is complete, I will be sent a copy of the study to the address I have provided during the interview.

Should I have any question, I may contact the researcher at (613) 688-2300 ext. 6539 (adao@chat.carleton.ca) or her supervisor, Dr. Vinod Kumar at (613) 520-2379 (vkumar@ccs.carleton.ca). I may also contact Professor Klaus Pohle at (613) 520-7434 (klaus_pohle@carleton.ca) regarding any ethics issues.

I have understood the above information and agree to participate in this study.

Signature

Date

QUESTIONNAIRE

This questionnaire will define the integrated JIT purchasing as a set of practices, implemented partly in the purchasing department and partly in the organization as a whole, that aim at reducing waste and inefficiency in the purchasing process. The integrated JIT purchasing practices are grouped into three categories: operational practices, supplier-buyer relationship development practices, and organizational practices.

Background Company Information

1. Company name: _____
2. Address: _____
3. Position of interviewee: _____
4. Nature of your business: _____
5. When did your firm begin this business? _____
6. Type of company ownership?

State owned enterprise ☐
Private owned ☐
Foreign invested ☐
7. What is your number of full-time employees?

Less than 100 ☐
100 – 300 ☐
More than 300 ☐

Integrated Just-In-Time Purchasing Practices

The following questions ask for your perception about the level of implementation of the integrated JIT purchasing practices in your organization. Please base the answers on your knowledge about the actual purchasing and production activities of your company. Rate each of the statements on a scale of 1 (strongly disagree that your organization implements this particular practice) to 5 (strongly agree that your organization implements this particular practice). *Please circle the appropriate number*

	Strongly disagree			Strongly agree	
<u>Operational Practices</u>					
8. We use frequent deliveries of small lot sizes for all parts/materials	1	2	3	4	5
9. We synchronize the contracting orders of the purchasing department with scheduling activities of the production (through the use of integrated computer systems and communication among departments)	1	2	3	4	5
10. We synchronize the deliveries of parts/materials with production requirements (through the use of integrated computer systems and communication with suppliers)	1	2	3	4	5
11. We use standard and reusable containers for parts/materials	1	2	3	4	5
12. We maximize the commonality of parts/materials for different products	1	2	3	4	5
13. We exchange information concerning costs intensively with our suppliers	1	2	3	4	5
14. We strive to minimize paper work concerning the purchasing function	1	2	3	4	5
15. We strive to control transportation means by having our own transportation means or using reliable third parties	1	2	3	4	5
16. We strive to control warehouses by having our own warehouses or using reliable third parties	1	2	3	4	5
17. We exchange information concerning quality intensively with our suppliers	1	2	3	4	5
18. We require suppliers to inspect parts/materials before they are delivered	1	2	3	4	5

	Strongly disagree			Strongly agree	
19. We strongly encourage our suppliers to emphasize continuous quality improvements in their own plants	1	2	3	4	5
20. We continuously exchange information concerning our product / process development with our suppliers	1	2	3	4	5
21. We strongly encourage our suppliers to participate in our product/process development	1	2	3	4	5
22. Our suppliers and we visit each other's plants frequently	1	2	3	4	5
23. We assign specific liaisons to specific suppliers to ensure the flow of information between us and our suppliers	1	2	3	4	5
24. We encourage our supplier to assign specific liaisons to us to ensure the flow of information between our suppliers and us	1	2	3	4	5

Supplier- buyer Relationship Development Practices

25. We keep a very small number of suppliers for each part/material purchased	1	2	3	4	5
26. We have a sole supplier for each part/material purchased	1	2	3	4	5
27. We have specific and formal criteria to select new suppliers	1	2	3	4	5

If you answer (1) to question# 27, please ignore the next four questions: 27a - 27d

27a. To select a new supplier, quality is considered

- Most important ☐
- Very important ☐
- Important ☐
- Little importance ☐
- Not important ☐

27b. To select a new supplier, cost is considered

- Most important ☐
- Very important ☐
- Important ☐
- Little importance ☐
- Not important ☐

27c. To select a new supplier, geographical proximity is considered

- Most important ☐
- Very important ☐
- Important ☐
- Little importance ☐
- Not important ☐

27d. To select a new supplier, supplier's willingness to be involved is considered

- Most important ☐
- Very important ☐
- Important ☐
- Little importance ☐
- Not important ☐

28. What are the other criteria you use to select your suppliers? (Please indicate their importance on a 5-point scale from (1) least important to (5) most important)

	Strongly disagree				Strongly agree
	1	2	3	4	5
29. We have specific and formal criteria to evaluate current suppliers					

If you answer (1) to question# 29, please ignore the next three questions: 29a – 29c

29a. To evaluate a supplier, quality is considered

- Most important ☐
- Very important ☐
- Important ☐
- Little importance ☐
- Not important ☐

29b. To evaluate a supplier, cost is considered

- Most important ☐
- Very important ☐
- Important ☐
- Little importance ☐
- Not important ☐

29c. To evaluate a supplier, the supplier's involvement is considered

- Most important ☐
- Very important ☐
- Important ☐
- Little importance ☐
- Not important ☐

30. What are the other criteria you use to evaluate your suppliers? (Please indicate their importance on a 5-point scale from (1) least important to (5) most important)

	Strongly disagree			Strongly agree	
31. We provide technical support to our suppliers	1	2	3	4	5
32. We provide financial support to our suppliers	1	2	3	4	5
33. We collaborate with our suppliers to reduce their costs	1	2	3	4	5

	Strongly disagree				Strongly agree
34. We collaborate with our suppliers to improve quality of parts/materials	1	2	3	4	5
35. We strive to cooperate with our suppliers to solve problems arisen	1	2	3	4	5

36. What are the other methods used to provide assistance and support to your suppliers?

	Strongly disagree				Strongly agree
37. We use long-term contracts with our suppliers	1	2	3	4	5
38. We allow for adjustments in the contracts with our suppliers	1	2	3	4	5
39. We limit the use of competitive bidding	1	2	3	4	5
40. We emphasize on committing formally to our suppliers to build trust and lasting relationships	1	2	3	4	5
41. We emphasize on committing informally to our suppliers to build trust and lasting relationships	1	2	3	4	5

42. What are the other incentives you provide to your suppliers?

	Strongly disagree				Strongly agree
43. We encourage our suppliers to extend JIT purchasing to their own suppliers	1	2	3	4	5
44. We strongly emphasize on involving all functions in our organizational in the attempt to develop long-term relationship with our suppliers	1	2	3	4	5

Organizational Practices

45. In our organization, information is shared between the purchasing function and the other functions	1	2	3	4	5
46. We use cross-functional cooperation to implement the current purchasing practices in our organization	1	2	3	4	5
47. We use cross-functional team to implement the current purchasing practices in our organization	1	2	3	4	5
48. Our overall strategy supports the current purchasing strategy	1	2	3	4	5
49. Our managers provide commitment and support to implement the current purchasing strategy in our organization	1	2	3	4	5

Firm Performance

The following questions ask for your perception about the performance of your plant compared to that of the others in your industry. Please base the answers on your knowledge about the defect rate, costs, productivity, and lead-time of your plant as well as of the industry average. *Please check the appropriate box*

50. Compared to your competitors in Vietnam, how would you rate your percentage of products that DO NOT require any rework before they are shipped?

- Best/highest in the industry ☐
- Much higher than average ☐
- Higher than average ☐
- Average for our industry ☐
- Lower than average ☐

51. Compared to your competitors in Vietnam, how would you rate your percentage of products that are found to be defective at your final inspection?

- Best/lowest in the industry ☐
- Much lower than average ☐
- Lower than average ☐
- Average for our industry ☐
- Higher than average ☐

52. Compared to your competitors in Vietnam, how would you rate your costs?

- Best/lowest in the industry ☐
- Much lower than average ☐
- Lower than average ☐
- Average for our industry ☐
- Higher than average ☐

53. Compared to your competitors in Vietnam, how would you rate the total productivity (labor and capital) of your plant?

- Best/highest in the industry ☐
- Well above average ☐
- Above industry average ☐
- Average for our industry ☐
- Below industry average ☐

54. Compared to your competitors in Vietnam, how would you rate your lead-time?

- Best/shortest in the industry ☐
- Much shorter than average ☐
- Shorter than average ☐
- Average for our industry ☐
- Longer than average ☐

Other comments _____

Thank you very much for your time

BẢNG CÂU HỎI

Trong bảng câu hỏi này, integrated JIT purchasing được định nghĩa như là một nhóm những phương pháp hoạt động, một số được áp dụng trong phòng mua bán vật tư, một số được áp dụng trong toàn thể công ty, nhằm mục đích giảm sự hao phí và tăng hiệu quả trong quá trình mua bán vật tư. Những phương pháp của integrated JIT purchasing được chia làm 3 nhóm: vận hành, phát triển quan hệ với người cung cấp nguyên vật liệu, và tổ chức nội bộ.

Thông Tin Về Công Ty

1. Tên Công Ty: _____

2. Địa chỉ: _____

3. Chức vụ của người phỏng vấn: _____

4. Ngành nghề hoạt động của công ty: _____

5. Công ty của anh/chị được thành lập khi nào? _____

6. Loại hình sở hữu?

Nhà nước ☐

Tư nhân ☐

Nước ngoài ☐

7. Công ty của anh/chị có bao nhiêu nhân viên?

Ít hơn 100 ☐

Từ 100 đến 300 ☐

Nhiều hơn 300 ☐

Những Phương Pháp Của Just-In-Time Purchasing

Những câu hỏi sau đây thăm dò ý kiến của anh/chị về mức độ thực hiện của những phương pháp của integrated JIT purchasing trong công ty của anh/chị. Xin dựa câu trả lời vào kiến thức của anh/chị về hoạt động của phòng vật tư và tổ chức SX của công ty anh/chị. Đánh giá mỗi câu nói theo trật tự từ 1 (không thực hiện phương pháp này) cho đến 5 (thực hiện triệt để). *Xin vui lòng khoanh vào câu trả lời đúng.*

	Không thực hiện			Thực hiện triệt để	
<u>Nhóm Phương Pháp Vận Hành</u>					
8. Việc áp dụng phương pháp nhận vật tư thường xuyên với số lượng nhỏ mỗi lần nhận	1	2	3	4	5
9. Việc phối hợp đặt mua nguyên vật liệu của phòng vật tư và kế hoạch SX (bằng cách sử dụng hệ thống máy vi tính và truyền đạt thông tin giữa các phòng ban trong công ty)	1	2	3	4	5
10. Việc phối hợp nhận vật tư theo yêu cầu SX (bằng cách sử dụng hệ thống máy vi tính và truyền đạt thông tin giữa các phòng ban trong công ty)	1	2	3	4	5
11. Việc sử dụng những thùng chứa giống nhau và có thể tái sử dụng để chứa nguyên vật liệu trong quá trình SX	1	2	3	4	5
12. Việc cố gắng tối đa sử dụng nguyên vật liệu giống nhau cho những sản phẩm khác nhau nhằm đơn giản hóa quá trình thu mua vật tư và cho người cung cấp vật tư	1	2	3	4	5
13. Việc trao đổi thông tin liên quan đến chi phí một cách tích cực với người cung cấp vật tư cho chúng tôi	1	2	3	4	5
14. Việc cố gắng giảm tối thiểu thủ tục hành chính cho phòng vật tư	1	2	3	4	5
15. Việc tránh bị động vào phương tiện giao thông vận chuyển nguyên vật liệu bằng cách tự sở hữu phương tiện giao thông hoặc sử dụng công ty vận tải đáng tin cậy	1	2	3	4	5

	Không thực hiện			Thực hiện triệt để	
16. Việc tránh bị động vào kho chứa vật tư bằng cách tự có kho hàng riêng hoặc sử dụng nơi cho thuê kho đáng tin cậy	1	2	3	4	5
17. Việc trao đổi thông tin liên quan đến chất lượng nguyên vật liệu một cách tích cực với người cung cấp vật tư cho chúng tôi	1	2	3	4	5
18. Việc yêu cầu người bán vật tư kiểm tra chất lượng sản phẩm của họ trước khi giao hàng	1	2	3	4	5
19. Việc mạnh mẽ khuyến khích người bán vật tư chú trọng vào việc liên tục nâng cao chất lượng sản phẩm của họ	1	2	3	4	5
20. Việc liên tục trao đổi thông tin liên quan đến phát minh, cải tiến sản phẩm/công nghệ của chúng tôi	1	2	3	4	5
21. Việc mạnh mẽ khuyến khích người cung cấp vật tư đóng góp ý kiến cho chúng tôi trong quá trình phát minh, cải tiến sản phẩm/công nghệ của chúng tôi	1	2	3	4	5
22. Việc chúng tôi và người cung cấp nguyên vật liệu của chúng tôi thường xuyên thăm nhà máy của nhau	1	2	3	4	5
23. Việc chúng tôi có những nhân viên được giao nhiệm vụ cụ thể chịu trách nhiệm thông tin liên lạc thường xuyên với những người bán vật tư cho chúng tôi	1	2	3	4	5
24. Việc chúng tôi khuyến khích người bán vật tư có những nhân viên được giao nhiệm vụ giữ liên lạc với chúng tôi	1	2	3	4	5

Không thực hiện

Thực hiện
triệt để**Nhóm Phương Pháp Phát Triển Quan Hệ Với Người Cung Cấp Nguyên Vật Liệu**

25. Việc cố gắng giữ một số lượng nhỏ người bán vật tư cho mỗi nguyên vật liệu chúng tôi mua	1	2	3	4	5
26. Việc giữ duy nhất một người bán vật tư cho mỗi nguyên vật liệu mua vào	1	2	3	4	5
27. Việc xác định những tiêu chuẩn cụ thể bằng văn bản để lựa chọn người cung cấp vật tư cho chúng tôi	1	2	3	4	5

Nếu anh/chị chọn câu trả lời (1) cho câu hỏi # 27, xin vui lòng bỏ qua câu hỏi 27a - 27d

27a. Để lựa chọn một công ty cung cấp vật tư mới, chất lượng được cân nhắc là:

- Yếu tố quan trọng nhất ☐
- Yếu tố rất quan trọng ☐
- Yếu tố quan trọng ☐
- Yếu tố ít quan trọng ☐
- Yếu tố không quan trọng ☐

27b. Để lựa chọn một công ty cung cấp vật tư mới, giá cả được cân nhắc là:

- Yếu tố quan trọng nhất ☐
- Yếu tố rất quan trọng ☐
- Yếu tố quan trọng ☐
- Yếu tố ít quan trọng ☐
- Yếu tố không quan trọng ☐

27c. Để lựa chọn một công ty cung cấp vật tư mới, khoảng cách được cân nhắc là:

- Yếu tố quan trọng nhất ☐
- Yếu tố rất quan trọng ☐
- Yếu tố quan trọng ☐
- Yếu tố ít quan trọng ☐
- Yếu tố không quan trọng ☐

27d. Để lựa chọn một công ty cung cấp vật tư mới, thái độ sẵn sàng tham gia giúp đỡ của người cung cấp vật tư được cân nhắc là:

Yếu tố quan trọng nhất	☐
Yếu tố rất quan trọng	☐
Yếu tố quan trọng	☐
Yếu tố ít quan trọng	☐
Yếu tố không quan trọng	☐

28. Công ty của anh/chị dựa vào những tiêu chuẩn nào khác để lựa chọn người cung cấp vật tư mới cho anh/chị? (Xin vui lòng xếp những tiêu chuẩn này theo thang điểm từ (1) đến (5) với (1) thể hiện tầm quan trọng thấp nhất và (5) thể hiện tầm quan trọng cao nhất của yếu tố này)

Không thực hiện

Thực hiện
triệt để

29. Việc xác định những tiêu chuẩn cụ thể bằng văn bản để đánh giá người cung cấp vật tư hiện hành cho chúng tôi	1	2	3	4	5
--	---	---	---	---	---

Nếu anh/chị chọn câu trả lời (1) cho câu hỏi # 29, xin vui lòng bỏ qua câu hỏi 29a - 29c

29a. Để đánh giá một công ty cung cấp vật tư hiện hành, chất lượng được cân nhắc là:

Yếu tố quan trọng nhất	☐
Yếu tố rất quan trọng	☐
Yếu tố quan trọng	☐
Yếu tố ít quan trọng	☐
Yếu tố không quan trọng	☐

29b. Để đánh giá một công ty cung cấp vật tư hiện hành, giá cả được cân nhắc là:

Yếu tố quan trọng nhất	☐
Yếu tố rất quan trọng	☐
Yếu tố quan trọng	☐
Yếu tố ít quan trọng	☐
Yếu tố không quan trọng	☐

29d. Để đánh giá một công ty cung cấp vật tư hiện hành, thái độ sẵn sàng tham gia giúp đỡ của người cung cấp vật tư được cân nhắc là:

- Yếu tố quan trọng nhất ☐
 Yếu tố rất quan trọng ☐
 Yếu tố quan trọng ☐
 Yếu tố ít quan trọng ☐
 Yếu tố không quan trọng ☐

30. Công ty của anh/chị dựa vào những tiêu chuẩn nào khác để đánh giá người cung cấp vật tư hiện hành cho anh/chị? (Xin vui lòng xếp những tiêu chuẩn này theo thang điểm từ (1) đến (5) với (1) thể hiện tầm quan trọng thấp nhất và (5) thể hiện tầm quan trọng cao nhất của yếu tố này)

	Không thực hiện				Thực hiện triệt để
31. Việc cung cấp sự ủng hộ về mặt kỹ thuật cho người cung cấp vật tư	1	2	3	4	5
32. Việc cung cấp sự ủng hộ về mặt tài chính cho người cung cấp vật tư	1	2	3	4	5
33. Việc hợp tác với người cung cấp vật tư cho chúng tôi để giảm giá thành SX cho họ	1	2	3	4	5
34. Việc hợp tác với người cung cấp vật tư cho chúng tôi để nâng cao chất lượng nguyên vật liệu	1	2	3	4	5
35. Việc cố gắng hợp tác với người cung cấp vật tư cho chúng tôi để giải quyết những khó khăn phát sinh trong quá trình mua bán vật tư	1	2	3	4	5

36. Ngoài ra, còn có những biện pháp nào khác mà công ty của anh/chị sử dụng để thể hiện sự giúp đỡ và ủng hộ đối với người cung cấp vật tư cho anh/chị?

	Không thực hiện				Thực hiện triệt để
37. Việc sử dụng hợp đồng dài hạn với người cung cấp vật tư	1	2	3	4	5
38. Việc cho phép thay đổi điều khoản trong hợp đồng với người cung cấp vật tư để đáp ứng những thay đổi trong tình hình thực tế	1	2	3	4	5
39. Việc giới hạn sử dụng đấu thầu giữa những công ty cung ứng vật tư cho chúng tôi	1	2	3	4	5
40. Chúng tôi nhấn mạnh vào việc đưa ra những cam kết chính thức với người cung cấp vật tư để xây dựng sự tin tưởng và mối quan hệ lâu dài	1	2	3	4	5
41. Chúng tôi nhấn mạnh vào việc đưa ra những cam kết không thành văn bản với người cung cấp vật tư để xây dựng sự tin tưởng và mối quan hệ lâu dài	1	2	3	4	5

42. Công ty anh chị còn đưa ra những khuyến khích nào khác cho người bán vật tư ?

	Không thực hiện			Thực hiện triệt để	
43. Việc khuyến khích người cung cấp tư của anh/chị cùng thực hiện những phương pháp của JIT purchasing đối với người cung cấp vật tư của họ	1	2	3	4	5
44. Việc nhấn mạnh sự tham dự của tất cả các phòng ban trong công ty của anh/chị vào quá trình cố gắng xây dựng mối quan hệ lâu dài với người cung cấp vật tư cho anh/chị	1	2	3	4	5

Nhóm Phương Pháp Tổ Chức Nội Bộ

45. Việc trao đổi thông tin giữa phòng vật tư và những phòng ban khác trong công ty của anh/chị	1	2	3	4	5
46. Việc sử dụng hợp tác giữa các phòng ban để áp dụng chiến lược mua bán vật tư trong công ty của anh/chị	1	2	3	4	5
47. Việc sử dụng những nhóm nhân viên từ tất cả các phòng ban trong công ty của anh/chị để thực hiện chiến lược mua bán vật tư của anh/chị	1	2	3	4	5
48. Việc chiến lược toàn diện của công ty anh/chị tạo điều kiện cho việc áp dụng chiến lược mua bán vật tư	1	2	3	4	5
49. Việc lãnh đạo công ty anh/chị đưa ra lời cam kết và thể hiện sự ủng hộ của họ đối với chiến lược mua bán vật tư hiện hành của công ty anh/chị	1	2	3	4	5

Hiệu Quả Sản Xuất

Những câu hỏi sau đây thăm dò nhận định của anh/chị về hiệu quả SX của công ty anh/chị so với các công ty khác trong cùng ngành công nghiệp. Xin vui lòng dựa câu trả lời vào kiến thức của anh/chị về tỉ lệ hàng thứ phẩm, giá thành, năng suất, và thời gian cần thiết để hoàn thành đơn đặt hàng của công ty anh/chị nói riêng và của ngành công nghiệp này nói chung. ***Xin đánh dấu vào ô trả lời thích hợp***

50. So với các công ty cạnh tranh của anh/chị, anh/chị đánh giá tỉ lệ phần trăm sản phẩm KHÔNG CẦN sửa chữa trước khi xuất xưởng như thế nào?

- Tốt nhất / Cao nhất trong ngành công nghiệp này ☐
- Cao hơn nhiều so với mức trung bình ☐
- Cao hơn so với mức trung bình ☐
- Ngang bằng so với mức trung bình ☐
- Thấp hơn so với mức trung bình ☐

51. So với các công ty cạnh tranh của anh/chị, anh/chị đánh giá tỉ lệ phần trăm sản phẩm không đạt yêu cầu ở khâu kiểm tra chất lượng sản phẩm cuối cùng như thế nào?

- Tốt nhất / Thấp nhất trong ngành công nghiệp này ☐
- Thấp hơn nhiều so với mức trung bình ☐
- Thấp hơn so với mức trung bình ☐
- Ngang bằng so với mức trung bình ☐
- Cao hơn so với mức trung bình ☐

52. So với các công ty cạnh tranh của anh/chị, anh/chị đánh giá chi phí SX của anh/chị như thế nào?

- Tốt nhất / Thấp nhất trong ngành công nghiệp này ☐
- Thấp hơn nhiều so với mức trung bình ☐
- Thấp hơn so với mức trung bình ☐
- Ngang bằng so với mức trung bình ☐
- Cao hơn so với mức trung bình ☐

53. So với các công ty cạnh tranh của anh/chị, anh/chị đánh giá năng suất SX của anh/chị (bao gồm nhân công và vốn) như thế nào?

- Tốt nhất / Cao nhất trong ngành công nghiệp này ☐
- Cao hơn nhiều so với mức trung bình ☐
- Cao hơn so với mức trung bình ☐
- Ngang bằng so với mức trung bình ☐
- Thấp hơn so với mức trung bình ☐

54. So với các công ty cạnh tranh của anh/chị, anh/chị đánh giá thời gian cần thiết để xử lý và hoàn thành đơn đặt hàng của khách hàng với công ty anh/chị như thế nào?

- Tốt nhất / Ngắn nhất trong ngành công nghiệp này ☐
- Ngắn hơn nhiều so với mức trung bình ☐
- Ngắn hơn so với mức trung bình ☐
- Ngang bằng so với mức trung bình ☐
- Lâu hơn so với mức trung bình ☐

Những ý kiến đóng góp khác _____

Xin cảm ơn sự hợp tác của anh/chị

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