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Supply Chain Management Practices and Supply Chain Performance Effectiveness

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1. Chapter 1: Introduction

Introduction:

Over the past two decades, supply chain management (SCM), emphasizing the interdependence of buyer and supplier firms working collaboratively to improve the performance of the entire supply has generated extensive interest in both academic and practitioner communities Shin and Collier others (2000).

Supply chain management is an integrated approach beginning with planning and control of materials, logistics, services, and information stream from suppliers to manufacturers or service providers to the end client; it represents a most important change in business management practices (Fantazy and Kumar Others 2010). It is one of the most effective ways for firms to improve their performance (Ou And Liu Other 2010).

SCM includes a set of approaches and practices to effectively integrate suppliers, manufacturers, distributors and customers for improving the long-term performance of the individual firms and the supply chain as a whole in a cohesive and high-performing business model Chopra S, Meindl P (2001).

A successful SCM implementation is expected to enhance the relationship between upstream suppliers and downstream customers, and thereby increase customer satisfaction and firm performance. Prior research has indicated SCM as a key driver of firm performance (Wisner and Leong 2005).

Everyone agrees that effective supply chain management can provide a major source of competitive advantage. The goal of a supply chain manager must therefore be to link the end customers, the channels of distribution, the production processes and the procurement activity in such a way that customers' service expectations are exceeded and yet at a lower total cost than the competition Many SCM studies were conducted in developed countries.

Furthermore most of the previous research focuses on the relationship between supply chain management practices and organizational performance Yap Lang Ling, Cheng Ling Tan (2012). in the other side the supply chain of performance there are some studies focused on measuring supply chain performance, such as Performance metrics in supply chain management by (Bhagwat Rajat, Milind Kumar Sharma2007). Specifically in the supply chain performance effectiveness. There are very few studies Despite the importance of supply chain practices on supply chain performance there is a lack on studies that link supply chain management practices and supply chain performance effectiveness this study seeking to contribute in filling this gap, SCMP in many developing countries is different from SCMP in developed countries. This study mainly focuses on manufacturing companies. Due to the lack of studies this study aims empirically test the relationships between SCM practices and supply chain performance effectiveness of manufacturing companies.

Globalization and intensive world-wide competition along with the technological advancements create an entirely new business environment for the manufacturing organizations. Initially, manufacturing companies have accomplished massive productivity gains through the implementation of lean production in response to this intensifying competition. The "waste" has eliminated from many different local

operations for the sake of better productivity. Currently such type of massive productivity improvements for many manufacturing organizations is very limited. Instead, there is a huge improvement potential to reduce the inefficiencies caused by the poor performance of the suppliers, unpredictable customer demands, and uncertain business environment. An integrated supply chain has a clear advantage on the competitiveness of the individual companies. As a result, the chain-chain competition has started to take over the enterprise-enterprise competition, although many enterprise-enterprise competitions do exist particularly in the less developed economies (Koh *et al.*, 2006). The forward-looking enterprises today are dynamic; they collaborate with suppliers, customers and even with competitors; share information and knowledge aiming to create a collaborative supply chain that is capable of competing if not leading the particular industry. Hence, gaining competitive edge under such a cut-throat environment becomes increasingly difficult, if not impossible.

The supply chain concept is theorized from the formation of a value chain network consisting of individual functional entities committed to providing resources and information to achieve the objectives of efficient management of suppliers as well as the flow of parts (Lau and Lee, 2000). Supply chain management (SCM) includes a set of approaches and practices to effectively integrate suppliers, manufacturers, distributors and customers for improving the long-term performance of the individual firms and the supply chain as a whole in a cohesive and high-performing business model (Chopra and Meindl, 2001). As defined by the Council of Supply Chain Management Professionals (CSCMP), SCM encompasses the planning and management of all activities involved in sourcing and procurement, conversion and all logistics management activities as well as coordination and collaboration with channel partners.

SCM and related strategies are crucially important to the success of a manufacturing firm. This is because the cost and quality of goods and services sold are directly related to the cost and quality of goods and services purchased. Therefore, supply chain policies such as procurement and supplier selection have an important role in the SCM (Hartley and Choi, 1996; Degraeve *et al.*, 2000). Lean practices to improve the internal processes of an organization in line with the principles of just in time (JIT) supply are other highly recognized practices in SCM (Burgess *et al.*, 2006; Cigolini *et al.*, 2004). Integration of internal processes of the organization with the suppliers and customers forms the essence of the whole idea behind SCM. With the widespread use of internet, web-based systems enable organizations to form strong customer and supplier integration for inventory management, demand forecasting, customer and supplier relationship management (Frohlich and Westbrook, 2002). The importance of better tracking of products logistics, improved efficiency in information processing, improved security, reduced counterfeit, fast-tracked quotation and ordering, improved customer relationships, better control of supplies on the SCM performance has been repeatedly reported by the cases such as Frankfurt Airport in Germany and Wal-Mart in the USA, even though these cases often are from more developed countries where appropriate infrastructure is in place. In all of these efforts, strategic planning for the manufacturing organizations has an integral role.

Regarding the implementation of SCM practices by manufacturing firms in Turkey, Ulusoy (2002, 2003) provides an excellent overview of the manufacturing firms with special emphasis on machinery and equipment industry. Predominantly, Turkish manufacturing industry relies on low cost strategy with respect to supply (Ulusoy, 2003) and uses “low cost” as a main supplier selection criterion in machinery and equipment industry (Ulusoy, 2002). This is not particularly surprising as far as the share of material costs within the total manufacturing costs are concerned (ranging from 56 per cent in machinery and equipment to 87 per cent in automotive). Quality appears to be order qualifier where the price is order-winner from the suppliers’ perspective (Ulusoy, 2003).

The purpose of this study is to determine the underlying dimensions of SCM practices and to empirically test a framework identifying the relationships among SCM practices, operational performance and SCM-related organizational performance with special emphasis on small and medium size enterprises (SMEs) in Turkey. Although the needs and operating environment of SMEs are very different from those of large firms, there is a dearth of literature regarding the use of SCM practices and its effect on performance of SMEs in emerging market economies such as Turkey. SMEs have significant impacts on supply chain performance, where they may serve the roles of suppliers, distributors, producers and customers (Hong and Jeong, 2006). In several emerging countries, SMEs form the largest group of manufacturing firms which essentially provide specialty manufacturing and support services to large firms (Huin *et al.*, 2002). SMEs also play a very crucial role to the economies of most emerging nations from the viewpoint of generating employment and economic growth. They account for more than half of the employment and added value in most countries (UNCTAD, 1993). Similar trend is also observed in Turkey where SMEs constitute 99.5 per cent of all business establishments and employ 61.1 per cent of the workforce (Yilmaz, 2004). In view of the fact that the success of small business has a direct impact on the national economy, this paper seeks to add to the body of knowledge by providing new data and empirical insights into the relationship between SCM practices and performance of SMEs operating in Turkey.

The remainder of this paper is organized as follows. The next section presents the literature review that helps to underpin the research framework and sets out the study’s hypotheses. The research methodology is presented in the third section. Results and discussion are in section four followed by conclusion and implications.

1.1. Research Background

1.2. Research Problem

Concept of the Supply Chain

The definition of supply chain management Is the integration of business processes from end user through original supplies that provides products, services, and information that add value to customers Galaskiewicz Joseph (2011) “supply chain" seems to be common across authors than the definition of "supply chain management". (Lalonde BJ 1998). and Masters proposed that a supply chain is a set of firms that pass materials forward. Normally several independent firms are involved in manufacturing a product and placing it in the hands of the end user in a supply chain –raw material and component producers, product assemblers wholesalers, retailer merchants, and transportation companies are all members of a supply chain (Lalonde BJ 1998).

Theoretical Gaps

Supply chain management practices (SCM P)

The practice of SCM refers to complete set of actions which are done in organizations towards to improve the effectiveness in the internal supply chain. The modern evaluation of the SCM practices that comprise of partnership with the supplier, process of outsourcing, compression of cycle time, continuousness of process flow and sharing or technology and information Tan, K. C., Kannan, V. R., & Handfield, R. B. (1998). by using purchasing the quality and relations with the customer SCM practices are defined as a set of activities undertaken in an organization to promote effective management of its supply chain Suhong Lia, Bhanu Ragu-Nathanb, and other(2006). Supply base management refers to how firms utilize their supplier's processes, technology, and capabilities

to enhance supply chain performance and competitive advantage and how the manufacturing, logistics, materials, distribution and transportation functions are coordinated within organizations Billington, C., Lee H.L. and (1992), also Mentzer, JT (2001), state that SCM in practice means includes the involved companies planning and strategy for coordination of their supply chain, including collaboration between functions internally as well as across company. SCM practices are defined also as approaches applied in managing integration and coordination of supply, demand and relationships in order to satisfy consumers in effective and profitable manners. A recent study found that firms often use supplier evaluation or performance measurement to identify specific supplier deficiencies and to develop plans to address them Krause, D.R. and T.V. Scannell(2002). Such efforts may involve the measurement of supplier’s delivery, quality, and cost performance, site visits, certification of supplier’s products and processes, and the setting of performance goals.

1.2.1. Practical Gaps

The Dimensions of Supply Chain Management Practices Many authors studied supply chain management practices and there are various elements and dimensions that have measured or used to measure the supply chain practice, for more exploration in the following

1. Chin et al. (2011) information sharing, customer relationship, strategic supplier partnership, material flow management and corporate culture.
2. Inda , et al (2012) Strategic supplier partnership, customer relationship, information sharing
3. Chowa , et al (2008) There are four elements (suppliers and customer mgt, information sharing, speed of communication, supply chain features)
4. Min & Mentzer(2004) There are seven elements of supply chain practice such as agreed vision and goals, information sharing, risk and award sharing, cooperation, process integration, a long-term relationship, and a greedy supply chain leadership.
5. Chen & Paulraj (2004) Using supplier base reduction, long-term relationship, communication, cross-functional teams, and supplier involvement to measure buyer-supplier relationships
6. Tan, Lyman, and Wisner,(2002) Six elements of supply chain practice (using factor analysis) supply chain integration, information sharing supply chain characteristics customer service management, geographical proximity, and JIT capability
7. Alvarado & Kotzab,(2001) Using inter-organizational systems in supply chain practice such as EDI, and elimination of excess stock levels by postponing customization toward the end of the supply chain
8. Tan, Kannan, and Handfield (1998) Supply chain practice includes purchasing quality, and customer relations
9. Donlon (1996, 117, October, pp.54–63) Supply chain practice includes supplier partnership, outsourcing cycle time compression, continuous process flow, and information sharing.

1.3. Research Significance

Supply chain performance effectiveness helps to provide many direct and indirect benefits for suppliers and manufacturing companies where it represents the ability to invent and produce solutions that add more value to (customers) than existing offers, also effectiveness adds great important for both manufacturing companies , supplier network and other parties, By using Resources based view theory the study aims to identify the effects of different dimensions of supply chain management practices (SCMP) on supply chain performance effectiveness (SCPE) of Sudanese manufacturing companies .and The quantitative method was employed, where convenience sampling and self-administrated survey questionnaires were sent to 110 manufacturer companies in Sudan. The study has found many empirical results which indicate that the practices of supplier's management have a significant positive effect on supply chain performance effectiveness. Furthermore the result of factor analysis adds a new dimension for supply chain management practices of Sudanese manufacturing companies. On the other hand the study has some limitations are in its focused on the manufacturing sector. Also the data were only collected from single respondents in an organization. The Practical implications this study it may explain to decision-makers and managers the importance of supply chain management practices on increase the supply chain performance effectiveness

1.3.1. At the practical level

By developing and validating a multi-dimensional construct of SCM practices and by exhibiting its value in improving operational performance of SMEs, it provides SCM managers with useful tool for evaluating the efficiency of their current SCM practices. Second, the analysis of the relationship between SCM practices and operational performance indicates that SCM practices might directly influence operational performance of SMEs.

1.4. Research Questions

How we can enhance the SCM Performance Effectiveness?

1.5. Research Objectives

The objective of this research is to examine the linkages between a firm's competitive environment, TQM, supply base management, and customer relation practices, and firm performance. This objective is driven by the notion that although firms have reengineered their internal operations to achieve higher quality levels, they have also become more dependent on their suppliers. As noted earlier, firms that have out-sourced non-core activities have realized they must now effectively manage the performance and capabilities of their suppliers of outsourced products and services. It can therefore be surmised that firms reporting the highest levels of financial and operational performance will be emphasizing not only internal quality initiatives, but also initiatives relating to the management of all elements of their supply chain including customers and suppliers, and the quality of delivered products. To test this proposition, the following hypotheses are proposed:

- A firm's competitive environment and management's responsiveness to it affects its
- performance.
- The use of TQM tools and practices positively affects performance.
- Effective management of the supply base positively affects performance
- A customer relations focus is positively related to high levels of performance.

1.6. Research Hypotheses

The SCM framework developed in this study proposes that SCM practices have a direct impact on the operational performance of SMEs. SCM practices are expected to increase an organization's operational performance through flexibility, reduced lead time, cost saving, resource planning, reduced inventory level and forecasting. As noted earlier, various SCM practices have an impact on various aspects of operational performance. This leads to the following hypothesis:

H1. with higher levels of SCM practices will have higher levels of operational performance.

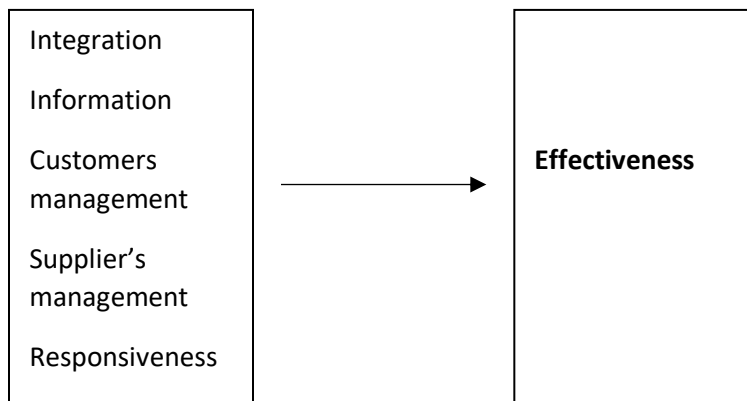
SCM practices influence not only operational performance, but also SCM-related organizational performance. They are expected to enhance the sales, integration between its departments and coordination with its suppliers and customers. Thus, we expect that:

H2. with higher levels of SCM practices will have higher levels of SCM-related organizational performance.

The relationship between financial and non-financial measures of organizational performance has long been discussed in organization and strategy literature. York and Miree (2004) argue that non-financial performance such as improved quality, innovativeness and resource planning should actually reduce costs, and thus have a

positive effect on measures of financial performance. Increased quality helps SMEs to retain current customers and create greater customer loyalty, which in return may increase market share and organizational performance (Rust et al., 1994). A number of prior studies demonstrate positive relationship between operational performance Impact of SCM practices109 dimensions such as product quality, (Larson and Sinha, 1995) innovation and R&D (Prajogo and Sohal, 2001; Singh and Smith, 2004) employee performance (Fuentes-Fuentes et al., 2004). Increase in operational performance may lead to high levels of organizational performance related to SCM in terms of increased sales, organization-wide coordination and supply chain integration. Hence, a positive relationship between operational performance and SCM-related organizational performance can be proposed.

1.7. Research Model



1.8. Research Methodology

3.1 Sample and data collection

A survey instrument was developed to investigate the impact of SCM practices on the performance of SMEs. The questionnaire was pre-tested several times to ensure that the wording, format, and sequencing of questions were appropriate. Occasional missing data on variables was handled by replacing them with the mean value.

The percentage of missing data across all data were calculated to be relatively small. There is no consensus on the definition of SME, as variations exist between countries, sectors and even different governmental agencies within the same country (Yusof and Aspinwall, 2000). In line with small business research, this study adopted the number of employees as the base for the definition of SME. An SME is identified as one that employs fewer than 250 staff. The minimum of at least ten employees was also chosen in order to exclude micro firms that would not be suitable for the purposes of this study. This range is consistent with the definition of an SME adopted by both the Turkish State Institute of Statistics (SIS) and Turkish Small Business Administration and also by a number of European countries such as Norway and Northern Ireland (Sun and Cheng, 2002; McAdam and McKeown, 1999).

Data for this study was collected using a self-administered questionnaire that was distributed to 800 SMEs operating in the manufacture of fabricated metal products and general purpose machinery (NACE codes 28 and 29) within the city of Istanbul in Turkey. For centuries as being the largest city of Turkey, Istanbul has been undisputedly the main industrial and trade centre. The city of Istanbul accounts for nearly 75 per cent of total capital investment generating nearly 23 per cent of Turkish GNP (Berköz and Eyuboglu, 2005). The sample was selected randomly from the database of Turkish Small Business Administration (KOSGEB). The KOSGEB database includes a total of 12,270 SMEs in Istanbul, which accounts for nearly 28 percent of all SMEs registered throughout Turkey. The sampling frame consists of 1,917 SMEs operating in both industries in Istanbul.

It was requested that the questionnaire be completed by a senior officer/executive in charge of SCM practices. The responses indicated that a majority of the respondents completing the questionnaire were in fact members of the top management. Of the 800 questionnaires posted, a total of 229 questionnaires were returned after one follow-up. A total of 26 questionnaires were eliminated due to largely missing values. The overall response rate was thus 25.4 percent (203/800), which was considered

satisfactory for subsequent analysis. A comparison of the annual sales volume, number of employees and sub-industry variation revealed no significant differences between the responding and non-responding firms ($p > 0.1$). Thus, the responses adequately represented the total sample group.

3.2 Measurement of variables

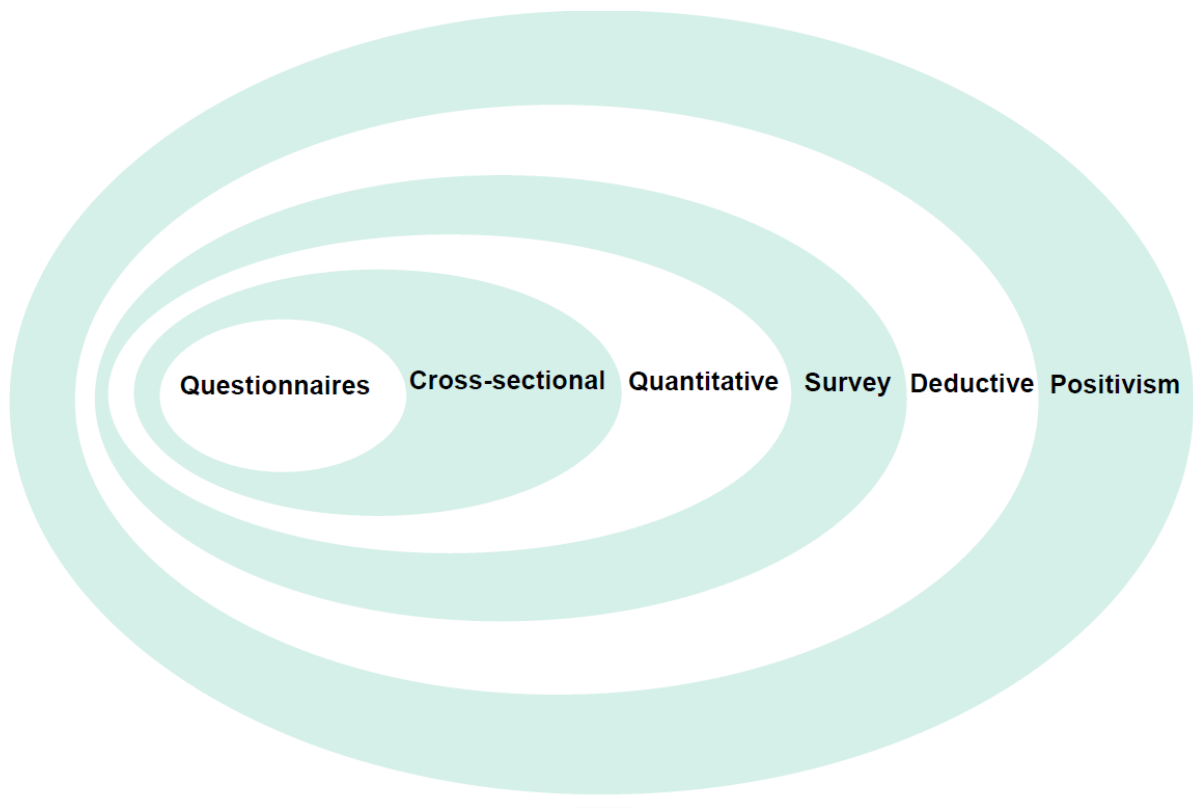
Based on the literature, a set of twelve SCM practices that are applicable to SME context were identified. These practices included “close partnership with suppliers” “close partnership with customers” “just in time supply” “e-procurement” “outsourcing” “subcontracting” “3PL” “strategic planning” “supply chain benchmarking” “few suppliers” “many suppliers” and “holding safety stock”. Respondents were asked to what extent the following SCM practices were implemented in their organizations relying on five-point scales ranging from 1 $\frac{1}{4}$ “not at all implemented” to 5 $\frac{1}{4}$ “fully implemented”.

It is generally recognized that it is difficult to select a single measure of firm performance. The literature lists several quantitative objectives that can be set to guide performance over a period of time, as well as qualitative objectives (Hunger and Wheelen, 1993; Thompson, 1993). It has been argued that as there are obvious difficulties in obtaining quantitative measures, there is a strong a priori case that qualitative measures should be included in assessments of performance (Chakravarthy, 1986). Therefore, the subjective approach has been used extensively in empirical studies, based on executives’ perceptions of performance, having been justified by several writers.

SME performance in this study was measured at two levels. A list of six operational (OPER) and five SCM-related organizational performance (ORG) measures were identified. The former group of performance indicators includes “reduced lead time in production” “cost saving” “forecasting” “resource planning” “reduced inventory level” and “flexibility” while the latter group includes “increase in sales” “more accurate costing” “increase in coordination between departments” “increase in coordination with suppliers” and “increase in coordination with customers”. Respondents were

asked to indicate on a five-point scale, ranging from “definitely better” through “about the same” to “definitely worse” or “don’t know” how their business had performed over the last three years relative to their major competitors on each of the operational and SCM-related organizational performance criteria.

The items used to measure SCM practices, operational and SCM-related organizational performance of SMEs are reproduced in Appendix 2.



1.9. The Suggested Project Structure

Chapter 1: Introduction

Chapter 2: Literature Review

Chapter 3: Research Methodology

Chapter 4: Statistical Analysis

Chapter 5: Findings` Discussion and Conclusion

2.Chapter 2: Literature Review

2.1. Introduction

Small and medium enterprises (SMEs) in the manufacturing industry require the implementation of strategies that allow them to make decisions that influence the process of obtaining results that are consistent with the objectives designed by managers [4-5]. Porter [6] has argued that an appropriate strategy is important for the development of SMEs, which makes it necessary for the businessmen to focus on assessing the specific needs of manufacturing SMEs and thus align their strategies [7- 9]. The increasing integration of information and communication technology (ICT) has led to favorable results in terms of goal accomplishment either generally or specifically in the functional areas of organizations [10-11]. The implementation of ICT in businesses such as manufacturing SMEs should be integrated in dynamic areas, such as the management of the supply chain [12], as this allows for better controls in the management of material resources, avoiding delays in production and thus enhancing compliance with customers [10 y 13]. This raises several research questions: Does the integration of strategies allow for a better usage in the adoption of information and communication technology? Does a greater integration of information and communication technology improve the supply chain management in manufacturing SMEs.

2.2. The independent variable

Stepwise multiple linear regression was used to develop models relating the two measures of performance to the twenty-three independent variables. Significance levels of 0.10 were used for entering and exiting variables respectively. The Durbin-Watson was used to verify that residuals were independent and normal probability plots were used to verify that residuals were normally distributed.

2.3. The dependent variable

also become more dependent on their suppliers. As noted earlier, firms that have out-sourced non-core activities have realized they must now effectively manage the performance and capabilities of their suppliers of outsourced products and services. It can therefore be surmised that firms reporting the highest levels of financial and operational performance will be emphasizing not only internal quality initiatives, but also initiatives relating to the management of all elements of their supply chain including customers and suppliers, and the quality of delivered products.

To test this proposition, the following hypotheses are proposed:

H1: A firm's competitive environment and management's responsiveness to it affects its

performance.

H2: The use of TQM tools and practices positively affects performance.

H3: Effective management of the supply base positively affects performance

H4: A customer relations focus is positively related to high levels of performance.

2.4. The relationship between the independent and the dependent variables

Discussion

One competitive environment variable, CE4, was significant in both regression models. This provides evidence to support the assertion that competitiveness can be compromised if management fails to adequately analyze the competitive environment. The variable's negative correlation with growth and

ROA does however suggest that devoting resources to analysis of competitors' strategies and actions can compromise growth and returns on asset. Such an outcome could occur if the analysis causes an organization to act in a reactive manner in response to a competitor's strategy, and diverge from an

otherwise preferred strategy. The models also suggest that it is the strategies of competitors that impact competitiveness rather than specific actions they might carry out or their positioning in terms of aggressiveness or number of competitive strengths. Not surprisingly, overall industry competitiveness correlates positively with overall performance, further supporting acceptance of hypothesis H1.

The impact of quality on performance has been extensively discussed in the literature. The current analysis however shows that the impact quality has on performance depends on the dimension of

performance being measured. Only one TQM factor, TQM2, has a positive impact on growth and ROA. This reflects the fact that in a competitive environment, growth in sales, market share, or return on assets requires an organization to benchmark performance and implement mechanisms that allow it to respond

to competitive pressures. However, when one examines overall performance, three factors, TQM1, TQM4, and TQM6 are significant, providing further support for hypothesis H2. The significance of these three factors illustrates the importance of having a strategic orientation towards quality rather than using piecemeal attempts to achieve quality. It also suggests the merits of a quality strategy that does not place undue attention on short-term performance.

The positive correlation between factor CR1 and the growth and ROA measure of performance is

significant for two reasons. First, it highlights the need to work with customers and identify their needs and expectations. Second, combined with the significance of using performance data in quality management, it demonstrates the importance of managing performance aggressively. In an intensely competitive environment, maintaining and improving one's competitive position requires efforts to better anticipate market needs and to identify and eliminate potential weaknesses in performance. The importance of a customer-oriented strategy is further illustrated by the fact that enhancing customers' ability to seek assistance has the greatest impact on overall performance. This analysis provides support for hypothesis H3. Managing the supply base has a significant impact on growth but not on overall performance. Evaluating suppliers and involving them in the decision making process are both positively related to growth and ROA. Supplier involvement has the greatest impact on growth and ROA of any of the six factors included in the regression model. The significance of managing the supply base is consistent with recent evidence that suggests that managing the supply chain is crucial to enhancing performance. As organizations downsize and outsource key inputs, maintaining control over the quality of inputs, lead times, and delivery reliability requires closer coordination with and involvement of suppliers throughout the production process. It also increases the need for organizations to ensure the quality of their suppliers.

2.5. Conclusion

Improving product and process quality have been well-established as ways by which organizations can respond to increased global competition. Now however, the challenges facing organizations go beyond improving quality. Organizations are increasingly faced with the reality that they cannot exist in isolation but are one piece of a complex chain of business activity. The results of this study support this notion and confirm that all three major components of a supply chain, suppliers, manufacturers, and customers, must be effectively integrated in order to achieve financial and growth objectives. Moreover, the results indicate well defined linkages between specific practices and performance. Successful management of the supply chain is the key to the long-term success of an organization. This cannot occur however if organizations implement business practices in an arbitrary, uncoordinated manner, or if they direct scarce financial resources to initiatives that are unlikely to yield positive outcomes. The results also highlight the fact that supply chain management initiatives alone cannot improve profitability and market share. With product life cycles shrinking, firms must unceasingly pursue new markets, new technologies, and improve cost and delivery performance. Supply chain management provides a framework within which to implement a well conceived market strategy, but it cannot undo the

effects of a poorly conceived one. It is therefore imperative for managers to ensure their quality and procurement implementation strategies, tactics, and measurements are correctly aligned with strategies in the areas of finance, operations, marketing, new product development, and sales.

Future research is needed to extend the findings of this study. The study has addressed the practices of organizations only one tier upstream and downstream. In the future, truly integrated supply chains may consist of multiple organizations in a chain working together to bring the latest technological innovations and products to customers at the lowest cost in the shortest time. There is a need to understand how future strategies will unfold and how organizational strategies will merge given different competitive objectives. An additional question is how will companies share financial rewards.

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