Moderating role of Market Orientation on the relationship between Supply chain linkages & Supply chain performance: An empirical study

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Abstract

The purpose of this research was to examine the link between Supply chain linkage strategies, market orientation, and supply chain performance, and to develop a model that describes the relationship among the three. The research studying supply chain management and its interactions with other strategic areas such as market orientation has been scarce in Pakistan. Therefore, a cross-sectional survey using snowball sampling approach was employed which resulted in a total of 84 responses from the managers working in the functional areas of supply chain and marketing in manufacturing companies of Pakistan. A hierarchical regression analysis was carried out to find the relationship between supply chain linkage strategies and supply chain performance using market orientation as a moderator. The results show that supply chain linkage strategies significantly impact the supply chain performance whereas; no evidence of moderation by market orientation has been indicated.

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1- Introduction

1.1- Background

Supply chain management (SCM) is viewed as a potentially valuable way of securing competitive advantage (Bechtel & Jayaram, 1997; Tan, et al., 2002). The strategic importance of successful supply chains has spawned the SCM philosophy and associated practices (Green Jr, et al., 2006). According to Zelbst, et al., (2009) success of an organization greatly depends upon the success of the whole supply chain therefore perfomance measurement of supply chains has become a crucial research area in order to quantify the efficiency and/or effectiveness of SC systems.

Power (2005) views supply chain (SC) integration as an integral part of the strategic positioning of organizations. SC integration has been recognized as a significant contributor to organization performance and thus has a vital role to play in an organization's competitive advantage and sustenance (Zailani & Rajagopal, 2005). The SC integration/ linkages to SC performance have also been extensively studied by various authors e.g. Sezen (2008); Lee, Kwon, & Severance (2007); Zailani & Rajagopal (2005).

On the other hand Market orientation (MO) is a much talked about construct in the marketing literature and there has been a continuing discussion on various aspects and applications of MO (M. A. Farrell, 2000). According to Foley & Fahy (2009) MO conceptualizations of Kohli and Jaworski (1990); Narver and Slater (1990) have been a significant step in operationalization of the marketing concept and advancement in marketing theory. The MO-to-performance link is also significant and robust as indicated by meta analysis carried out by various researchers e.g. Kirca, Jayachandran, & Bearden (2005); Shoham, Rose, & Kropp (2005); Rodriguez Cano, Carrillat, & Jaramillo (2004). However, Murray et al. (2010) argued that "only if a firm takes appropriate strategic actions to capitalize on market orientation can it create a competitive advantage in achieving higher performance". Thus in an organization both SC integration and MO intuitively must operate synergistically to ascend success.

1.2- Research Gap

Both SC linkages and MO have been independently tested and verified to have significant and positive impact on various organizational performance measures. However, in an organizational setting various strategies at departmental level have to be integrated as intuitively they affect one another. For example marketing strategy may affect SC strategy; because of marketing unique strategy requirements of creating value for the customer using front end logistics. This may have an impact on the whole SC performance. Furthermore, it is interesting to see that Min & Mentzer (2000) in their study conclude that MO and SCM are not separate rather they are closely related to each other. Another study by Green Jr, McGaughey, & Casey (2006) suggests that a manufacturing firm's SCM strategy mediates the relationship between its market orientation and organizational success. Despite the abundance of research on MO & SC integration; no study has been conducted where relationship between SC linkages and MO are empirically tested for their impact on SC performance.

1.3- Objectives of the study

Given the above arguments, the main objectives of this study is check whether there is link between SC linkage strategies and SC performance. Furthermore, the paper addresses the issue whether there is a link between customer orientation and inter-functional coordination (MO) and SC linkage strategies? In order to do so this study presents a new conceptual model and tests it with the goal of providing evidence that could there be a link between SC linkage strategies, MO and SC performance?

This thesis is organized in the following manner. The next section (section 2) presents a detailed literature review on supply chain linkages, market orientation and supply chain performance. Research questions and hypotheses have also been presented at the end in this section. The next section (section 3) discusses the research method used for data collection. Section 4 presents the data analysis and the results regarding the tests of hypotheses. Section 5 includes the discussion on the results presented in previous section (section 5). Finally, the last section (section 6) concludes this thesis and presents managerial implications and its contribution to the body of knowledge. Limitations of the study along with guidelines for future research have also been presented in this section.

2- Literature Review

This section presents a detailed overview of literature on constructs relating to SC linkages, MO and SC performance. Section 2.1 discusses the literature on SCM and its strategic importance. Section 2.2 presents literature on SC performance and the impact of SC linkage strategies SC performance. Section 2.3 presents the literature on SC integration and linkage strategies. Section 2.4 discusses the marketing concept and the role of MO in implementing marketing concept. Section 2.5 reviews the literature on MO and section 2.6 presents literature on the impact of MO on various organizational performance measures. Section 2.7 highlights the interaction between MO and SCM and its relevance in the context of SC linkages and SC performance. Research questions and Hypotheses to be tested in the study have been presented in the end of this section.

2.1- Supply chain Management: Definition and strategic importance

Supply chain management has emerged as a key aspect of the business to look and work upon in today's world of cut throat competition. Supply chain management has received attention since the early 1980s. A Supply chain is defined as "a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumers" (Christopher & Ryals, 1999, p. 3). According to Tan, et al., (1999) the scope of SCM that he calls materials o supply management ranges from the supply of basic raw materials to final product (and possible recycling and re-use). SCM focuses on enhancing firm's competitive advantage through utilizing their suppliers' processes, technology and capability to add value in increasing this competitive advantage. SCM is also known as a management philosophy that extends traditional intra-enterprise activities by bringing trading partners together with the common goal of optimization and efficiency.

Ever since the SCM field has evolved there have been several studies concerning different areas with SC context. SCM has been regarded as a potentially important way of securing competitive advantage (Bechtel & Jayaram, 1997; Tan, et al., 2002) and improving organizational performance since competition is no longer between organizations, but among supply chain (Li, et al., 2006; Prado-Prado, 2009). This concept has led to the realization that in order to perform well; a company is dependent on its upstream and downstream supply chain partners and each entity in the SC affects all others (Levy, et al., 1995). Therefore integration of all the business processes has become a prime focus of SCM (Chan & Qi, 2003) and the goal in SCM is to achieve higher level of synchronization among SC partners (Zhang, et al., 2011).

2.2- Supply Chain Performance

This section provides a brief literature review of performance management concept and its relationship with SCM performance and related constructs. In the end of the section, framework used to measure the supply chain performance in the current study has been presented along with the variables.

2.2.1- Performance measurement

Neely, et al.,(1995) defines performance measurement (PM) as,

> PM is defined as a metric used to quantify the efficiency and/or effectiveness of an action; and a performance measurement system (PMS) is defined as the set of metrics used to quantify the efficiency and effectiveness of an action.

Tangen (2004) explains conceptual issues that are very instrumental for a PM systems: these include:

Support strategic objectives: A PMS should be consistent with the overall strategy of the organization. Furthermore, the PMS should be flexible enough to be changed accordingly, with the change in the overall firm strategy over the period of time.

Have an appropriate balance: PMS should be balanced in a way that it covers all the aspects of an organization's success. The wide scope of PMS should be incorporating various measures with a focus on the short term and long term goals of organizations at various levels.

Guard against sub-optimisation: The performance measures used in PMS should be in line with the corporate goals and there must exist a clear understanding of theese measures so that employee behaviour should be consistent with the PMS and the corporate goals.

Have a limited number of performance measures: In order to decrease the risk of information overload, the PMS should include the most critical measures and old measures that do not contribute to the performance should be dropped from the system.

Be easily accessible: the main goal of a PMS is to ensure the availbility of timely andaccurate information to the right person. Therfore, the design aspects of a PMS should ascertain the easy availibility of information retrieval so that it can be handily understood and presented by the evaluaters.

2.2.2- Performance Measurement in Supply Chain:

Shoham, et al., (2005) state that performance is approached in many ways that include various determinants of performance such as market share, profitability, return on assets or on investment, change in market share or profitability, new product success, and using several combination of these performance measures. Later on the focus of performance measurement research has shifted to the whole supply chain as opposed to individual companies. One main reason for this shift is the fact that success of an organization greatly depends upon the success of the whole supply chain (Zelbst, et al., 2009).

Beamon (1999) presented a framework for the measurement of supply chain performance based on performance indicators grouped in three categories i.e. flexibility performance, resource performance and output performance. These measures were also used by Sezen, (2008) in his study. *Flexibility* is defined evaluating the ability of supply chains to respond changes in products, delivery times, volume, and product mix. The meaures for flexibility performance include new product flexibility, delivery flexibility, mix flexibility and volume flexibility (Sezen, 2008). *Resource* measures stress the efficient usage of SC resources. In order to measure the SC resource costs of using several resources, inventory levels in the supply chain, and the return on investments are considered very important (Sezen, 2008). Whereas, *Output* measures incorporate factors such as customer satisfaction, sales quantities, and profit. The customer satisfaction is measured on the basis of on-time deliveries, order fill rate, and response times (Sezen, 2008).

Chan & Qi, (2003) suggested a systems perspective for performance measurement and provided a framework for the SC performance evaluation using time, cost, capacity, capability, productivity, utilization and outcome as performance categories. Brewer & Speh (2000); Kleijnen & Smits (2003) suggested measurement of supply chain performance through balanced scorecard approach. Gunasekaran, Patel, & Tirtiroglu (2001); Gunasekaran, Patel, & McGaughey (2004) used SCOR model categories of plan, source, make and deliver to develop supply chain performance measures related to strategic, operational and tactical areas.

According to SCOR model version 10 publised by SC Council (2010); the performance section of SCOR consists of two types of elements: Performance Attributes and Metrics.

The core SC performance atrributes identified by SCOR are: Reliability, Responsiveness, Agility, Costs, and Asset Management.

Reliability: Reliability being a customer centered attribute deals with measuring the outcomes of a process and capability to perform tasks as per expectations. Typically the reliability metrics include the attributes such as: on-time, the right quantity, the right quality.

Responsiveness: The Responsiveness being a customer focused attribute explain the cycle time or the speed of the taks performed.

Agility: The Agility is also a customer focused attribute that is characterized by flexibility (ability to respond) and adaptability (ability to change) in response to the external influences such as: Non-forecasted increases or decreases in demand; suppliers or partners going out of business; natural disasters; acts of (cyber) terrorism; availability of financial tools (the economy); or labor issues.

Costs: The Cost is regarded as an internally focused attribute that describes the cost of operating costs such as cost of goods sold (CGS) and SCM cost. It consists of labor costs, material costs, and transportation costs.

Assets: The Assets are also known as internally focused attribute that is measured by cash to cash cycle time and return on fixed asset. This attribute mainly refers to forming SC asset utilization strategies (inventory reduction and in-sourcing vs. outsourcing) focusing on the efficient utilization SC assets. Asset management strategies in a supply chain include inventory reduction and in-sourcing vs. outsourcing. The metrics for asset utilization include: inventory days of supply and capacity utilization.

Metrics: SCOR uses a three level metrics system as a standard analytical tool for the performance measurement of a process.

- Level 1 metrics are known as strategic metrics and key performance indicators (KPIs) that indicate whole SC condition and are also used to formulate practically achievable targets that support the strategic goals of the organization.
- Metrics at Level 2 provide an analysis on the level 1 metrics which helps in understating the performance gaps and identify the root cause for such gaps.
- Metrics at Level 3 provide an analysis on the level 3.

This analysis (level 1 through level 3) provides a breakup of performance metrics to study and identify processes that need to be improved.

(Source: SCOR model version 10.0 publised by SC Council)

Various measures of SC performance have been looked upon in different ways like role of design Integration and information sharing on supply chain performance (Sezen, 2008); effect of trust on supply chain collaboration and logistics efficiency (Ha, et al., 2011). Table 2.1 summarizes the various frameworks employed for the SC performance;

Table 2.1 SC Performance constructs

Study	Framework for Measuring SCP
SCOR (2010)	Reliability, Responsiveness, Agility, Costs, Asset Management and SCOR Metrics.
Sezen,(2008); Beamon,(1999)	Flexibility, Output and Resource Performance
Lee, et al., (2007)	Cost containment and Reliability
Forslund & Jonsson,(2007)	Corrective action, Preventive action and Customer service performance
Hausman,(2004)	Service, Assets, Speed
Chan & Qi,(2003)	Cost, Time, Capacity, Capability, Productivity, Utilization, and Outcome
Gunasekaran, et al.,(2001)	Strategic, Tactical and Operational Measures
Agarwal & Shankar,(2002)	Market Sensitiveness, Process Driven, and Process Integration
Brewer & Speh,(2000)	End Customer benefits, SCM Improvement, SCM Goals, and Financial Benefits

However, this study uses two well-known indicators of Supply chain performance measures advanced by Lee, et al., (2007) i.e. cost-containment and performance reliability constructs. *Cost-containment* indicator of SC performance entails in bound and out bound costs of SC activities. These activities and related costs include: warehousing costs, and inventory-holding cost, and increasing asset turnover. The *Reliability* indicator of SC performance involves SC activities such as order fulfillment rate, inventory turns, safety stocks; inventory obsolesces, and number of product warranty claims" (Lee, et al., 2007, p. 446).

In their study Lee, et al., found a direct positive relationship of cost containment and reliability with the degree of linkage among customer, internal integration, and supplier. This study will test and verify these variables in a different contextual environment to explore a better insight of these measures on SC performance. The following section will discuss relevant literature highlighting the strategic importance of SC integration.

2.3- Supply chain Integration & Linkages

The recent years have seen growth in the importance of integration between suppliers, manufacturers and customers (Leenders & Johnson, 2000). This very concept which refers to a formation of network encompassing elements of supply chain, which are the suppliers, customers and the company, has seen growing consensus concerning the strategic importance of SC integration (Zailani & Rajagopal, 2005). Bowersox (2011) state that integrated SC is not a new idea, but that it has only recently become feasible with the companies having access to the critical information that is accurate, timely and affordable.

However, "integration is not an easy task, as has been demonstrated by former UPS CEO Mr. Mike Eskew, who openly admitted that the integration of Menlo Forwarding and Overnight LTL carriers by UPS was a very slow process" (Cited in Lee, 2012). Following section presents the literature on various aspects and practices of SC integration.

Supply chain integration (SCI) has been a well investigated construct in the SCM literature. Some authors studied SCI as a single uni-dimensional construct (Crespo Marquez, et al., 2004; Rosenzweig, et al., 2003; Sezen, 2008; Vickery, et al., 2003). While others view Supplier integration (Cousins & Menguc, 2006; Das, et al., 2006; X. A. Koufteros, et al., 2007; Petersen, et al., 2005; Ragatz, et al., 2002) and Customer integration (Homburg & Stock, 2004) as dimensions of SC integration. Meanwhile, some have examined collaborative relationships between a manufacturer with either its customers or suppliers such as internal and downstream integration (Germain & Iyer, 2006; Pagell, 2004), internal and external integration (Campbell & Sankaran, 2005; Kim, 2006; Saeed, et al., 2005; Stank, et al., 2011; Zailani & Rajagopal, 2005), supplier and customer integration (Devaraj, et al., 2007; Droge, et al., 2004; Frohlich & Westbrook, 2001). On the contrary, there exists a three dimensional approach to SC integration that include customer, internal and supplier integration constructs

(Flynn, et al., 2010; X. Koufteros, et al., 2005; Lee, et al., 2007; Narasimhan & Kim, 2002; Stank, et al., 2001). Few of the studies relating to SC integration have been discussed in brief:

2.3.1- Supply chain integration according to Zailani & Rajagopal, (2005)

By re-categorizing and narrowing down Narasimhan & Kim (2002) work on SC integration, Zailani & Rajagopal, (2005) presented a classification of SC integration into four major categories:

1. *Information sharing:* "Information sharing refers to exchange of information among company, customers and suppliers" (Narasimhan & Kim, 2002, p. 383).

INFORMATION EXCHANGE WITH SUPPLIERS

The relationship between the company and its supplier is very much affected by the level of information sharing i.e. how much information is shared. They believe that market information exchange between company and suppliers as an indirect determinant of performance (Narasimhan & Kim, 2002).

LEVEL OF ORGANIC LINKAGE WITH CUSTOMERS THROUGH INFORMATION NETWORK

An organic linkage refers to the link between the company and customer(s). the information sharing between the company and the customer strengthens the link between these SC partners (Narasimhan & Kim, 2002, p. 383).