

An investigation of the relationship between supply chain management practices (SCMP) on supply chain performance measurement (SCPM) of Indian retail chain using SEM

Indian retail
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Abstract

Purpose – The purpose of this paper is to investigate the relationship between two major constructs (supply chain management practices (SCMP) and supply chain performance measures), which determines the efficiency and efficacy of retail-supply chain management, using a rigorous empirical method to validate the instrument scale for measuring the validity and reliability of the identified constructs. Additionally, the paper further tests the relationship between SCMP and supply chain performance measures using structural equation modeling (SEM).

Design/methodology/approach – Data were compiled and collected from 213 operations and supply chain (SC) heads from leading retail stores in India. Confirmatory factor analysis was used to test the validity of the proposed measurement scale and the relationship is tested using SEM.

Findings – The results of the research will help the decision makers in the SC/procurement field to understand the importance of the association between SCMP and supply chain performance measures. Statistical tests show that the implementation of SCMP are associated with supply chain performance measures, which leads to overall improvements; moreover, there is a statistically significant association between the five SCMP and eight SCPM.

Research limitations/implications – This research is also needed to provide more understanding about the SCMP along with the supply chain performance measures and the positive association among them. Overall, this research provides an additional insight into the growing field of the relationships between SCMP and SCPM. Clearly, the field has ample space to grow in terms of research and practice.

Originality/value – This research paper contributes to the literature on supply chain performance measurement.

Keywords Supply chain performance measurement, Supply chain management, Indian retail sector, Supply chain management practices

Paper type Research paper

1. Introduction

Retailing is the interface between the producer and the individual consumer buying for personal consumption. As such, retailing is the last link that connects the individual consumer with the manufacturing and distribution chain. Although the retail industry has traditionally been divided into store and non-store retailers, the “brick-and-click” business model is gaining prominence because the integration of retail processes across multiple channels allows retailers to benefit from the strengths of each channel and offers consumers multiple touch points and innovative services (Noble *et al.*, 2009; Wallace *et al.*, 2004; Oh *et al.*, 2012).

Indian retail industry is one of the sunrise sectors with huge growth potential. However, in spite of the recent developments in retailing and its immense contribution to the economy, retailing continues to be the least evolved industries and the growth of organized retailing in India has been much slower as compared to the rest of the world (Jain, 2013).



In India, the retail industry is vastly unorganized with the organized sector coming to the fore in recent times only. For the year 2012, the organized retail accounts for 7 percent of India's US\$ 435 billion retail market and is expected to reach 20 percent by 2020. In India, the dynamic retail landscape presents a grand opportunity to investors from across the globe to use India as a strategic business hub. As shown in Table I the rate is further expected to accelerate to 18.8 percent over the next few years to take retail to 4,780,318 crore (\$866 bn) by 2015.

Modern retail, which stood at 138,961 crore (\$25.2 bn) in 2010 with a share of 6.6 percent in the total retail market, expanded to 26.8 percent compound annual growth rate (CAGR) to reach 223,572 crore (\$40.5 bn) in 2012, thus increasing its share to 7.8 percent in the total retail market. Going further, modern retail is expected to expand by an impressive 29.7 percent CAGR to reach 487,423 crore (\$88.3 bn) in 2015. As a result, modern retail will breach the single-digit barrier to claim a share of 10.2 percent of the total retail market in the next three years.

Retail SC are incredibly complex due to the large number of SKUs, multiplicity of sales and storage locations, unpredictability and sensitivity of demand as well as the variety of formats handling a number of categories. In fact, there are a number of separate SCs at the backend for each category that all come together to make available the right product at the right place at the right time and at the right cost to the customer at the retail outlet front end. Hence, an understanding of retail SCs involves understanding each category separately and how the same are merged to come together at the optimal time and place to deliver full value to the customer (Popli and Kumari, 2013).

Supply chain management (SCM) provides a recognized foundation for retail industry success and the performance measurement provides a progressive road ahead to continue the success path (Arnold, 2002; Ganesan *et al.*, 2009). Despite this fact there is dearth in SC research which is considered as ascendancy of retail as the primary power in the business to consumer channel (Defee *et al.*, 2009). This narrow focus is not surprising, retail-SCM (R-SCM) research has been more an opportunistic extension of manufacturing theory, along with consumer product marketing and distribution theory, rather than a holistic, ground up construction of a critical research domain.

The objectives of this paper are as follows: first, we attempt to investigate the relationship between two major constructs (supply chain management practices (SCMP) and supply chain performance measures), which determines the efficiency and efficacy of R-SCM. Second, using rigorous empirical method we validate the instrument scale for measuring the validity and reliability of the identified constructs and provide a set of variables as benchmark consisting of 43 items. Additionally, the paper further tests the relationship between SCMP and supply chain performance measures using structural equation modeling (SEM) based on 213 responses from industry professionals in the retail sector.

This paper is organized into three main sections: first the literature review which provides the details of the constructs; the second section gives the research methodology adopted in the paper; and the third part covers the analysis and interpretation followed by conclusion and managerial implications.

2. Review of the literature

SCM is an integral part of organizational value chains and is critical for firm performance (Flynn *et al.*, 2010; Ketchen and Hult, 2007). SCM involves a complex array of business processes, such as procurement or sourcing; product design and development; collaborative planning, forecasting, and replenishment and distribution (Chen and Paulraj, 2004a, b). Effective and efficient execution of these processes is critical for operational efficiency and sustainable competitive advantage. Hence, organizations spend millions of dollars to

implement various SCMP, information technologies (ITs), to support these processes and make them effective and efficient (Devaraj *et al.*, 2007; Rai *et al.*, 2006). Implementation of these systems requires substantial changes to SCM processes, and prior research and the practitioners' literature have noted significant challenges that organizations may face when embracing and routinizing these changes (Lee, 2012; Oliva and Watson, 2009; Bala, 2013).

The relationship between various SCMP and supply chain performance measure is an extremely popular research field, which has contributed to a substantial body of scholarly work such as those of Gunasekaran and Kobu (2007), van der Vaart and van Donk (2008), and Rexhausen *et al.* (2012). To better understand the antecedences and consequences of SCM, two constructs have been identified through a comprehensive literature review. A research model is then developed that depicts the various causal relationships between these constructs.

2.1 SCMP

SCMP have been defined as the set of activities undertaken in an organization to promote effective management of its SC. Donlon (1996) describes the latest evolution of SCMP, which includes supplier partnership, outsourcing, cycle time compression, and continuous process flow, and IT sharing. With greater customer value and competitive advantage being the overriding objectives of supply management (Wisner, 2003), it is contended that integrated SCMP of the firm, such as strategic alliances or formal supplier development strategies, information sharing (IS), information quality (IQ), can impact relative competitive quality. Integrated supply management, which can be defined as practices dealing with the effective and efficient management of the supply base (Talluri and Narasimhan, 2004), has been shown to impact the overall firm performance (Narasimhan and Das, 1999; Scannell *et al.*, 2000; Chen and Paulraj, 2004a; Chen *et al.*, 2004), elevating the importance of appropriate sourcing strategies (Elmaghraby, 2000).

On the basis of previous literature, SCMP are portrayed from different perspectives with a common aim of improving organizational performance. In reviewing and consolidating, the literature in the above section, Table II provides the chronological literature on the six dimensions of SCM practices, namely strategic supplier partnership (SSP), customer relationship, IQ, IS, lean practises, and postponement (Gawankar *et al.*, 2013).

A more detailed discussion based on the review of research studies on the SCMP is presented in the succeeding paragraphs.

2.1.1 SSP. SSP is defined as the long-term relationship designed to leverage the strategic and operational capabilities of the individual participating organization to achieve significant benefits to each party (Li *et al.*, 2005, Li and Lin, 2006). A true supplier partnership encourages mutual planning and problem-solving efforts (Gunasekaran *et al.*, 2001), and is critical in operating a leading-edge SC. Azar *et al.* (2010) have investigated the impact of supplier management on the performance and have found that effective supplier management is directly related to higher level of performance conformance. Supplier-buyer strategic partnerships are widely considered as an effective source of competitive advantage by firm's operating in turbulent business environments (Kamble *et al.*, 2012). A strategic supplier, working with a buyer to develop new products, can showcase its capabilities to

	2010 (in Cr.)	2012 (in Cr.)	Growth (%)	Est. 2015 (in Cr.)	Est. growth (%)
Total retail	2,119,634	2,850,055	16.0	4,780,318	18.8
Modern retail	138,961	223,572	26.8	487,423	29.7
Share % of modern retail	6.6	7.8		10.2	

Table I.
Growth figure
of retail market for
the year 2010-2012

Table II.
Chronological
literature review on
selected supply
chain practices

Supply chain management practices	Literature review
Strategic supplier partnership (SSP)	Lamming (1996), Wines (1996), Balsmeier and Voisin (1996), Aggarwal (1997), Noble (1997), Monczka <i>et al.</i> (1998), Sheridan (1998), Burgess (1998), Magretta (1998), Claycomb <i>et al.</i> (1999), Day (2000), Tan <i>et al.</i> (2002), Moberg <i>et al.</i> (2002), Gunasekaran and Chung (2004), Li <i>et al.</i> (2005), Li and Lin (2006), Radas and Božić (2009), Azar <i>et al.</i> (2010), Singh <i>et al.</i> (2010), Sundram <i>et al.</i> (2011), Sukatnia <i>et al.</i> (2012)
Customer relationship practices (CRP)	Scott and Westbrook (1991), Ellram (1991), Turner (1993), Wines (1996), Handfield and Nichols (1999), Kalakota and Robinson (1999), Gunasekaran <i>et al.</i> (2001), Bommer <i>et al.</i> (2001), Tan <i>et al.</i> (2002), Moberg <i>et al.</i> (2002), Vickery <i>et al.</i> (2003), Li <i>et al.</i> (2005), Li and Lin (2006), Thatte (2007), Ngai <i>et al.</i> (2008), Pereira (2009), Singh <i>et al.</i> (2010), Sundram <i>et al.</i> (2011)
Information sharing (IS)	Berry <i>et al.</i> (1994), Lee <i>et al.</i> (1997), Mason-Jones and Towill (1997), Monczka <i>et al.</i> (1998), Jarrell (1998), Holmberg (2000), McAdam and McCormack (2001), Moberg <i>et al.</i> (2002), Feldmann and Müller (2003), Li <i>et al.</i> (2005), Li and Lin (2006), Singh <i>et al.</i> (2010), Prajogo and Olhager (2011), Sundram <i>et al.</i> (2011)
Information quality (IQ)	Alvarez-Gil (1994), Novack <i>et al.</i> (1995), Balsmeier and Voisin (1996), Towill (1997), Monczka <i>et al.</i> (1998), Lalonde (1998), Stein and Sweat (1998), Jones <i>et al.</i> (1998), Mentzer <i>et al.</i> (2000), Childhouse and Towill (2003), Li <i>et al.</i> (2005), Li and Lin (2006), Singh <i>et al.</i> (2010), Prajogo and Olhager (2011), Sundram <i>et al.</i> (2011)
Postponement practices (PP)	Lee and Billington (1992), Beamon (1998), Van Hoek and van Dierdonck (1997), Van Hoek (1998), Naylor <i>et al.</i> (1999), Waller <i>et al.</i> (2000), Zografos and Giannouli (2001), Li <i>et al.</i> (2005), Li and Lin (2006), Singh <i>et al.</i> (2010), Sundram <i>et al.</i> (2011)
Lean retailing strategies (LRS)	Lamming (1996), Womack and Jones (1996), Aggarwal (1997), Mason-Jones and Towill (1997), Metters (1997), Taylor (1999), McIvor (2001), Li <i>et al.</i> (2005), Li and Lin (2006), Koh <i>et al.</i> (2007), Singh <i>et al.</i> (2010), Sundram <i>et al.</i> (2011), Azadegan <i>et al.</i> (2013)

other customers of the buyer that then lead to other business opportunities (Narayandas and Rangan, 2004; Ro *et al.*, 2008; Chen *et al.*, 2013). Similarly, Boddy *et al.* (2000) and Bordonaba and Cambra (2009) also viewed SC partnering (which is the broader concept of supplier strategic partnering) as crucial asserting that such strategic collaboration will definitely enhance performance among SC collaborative partners. Griffith and Harvey (2001) and Sundram *et al.* (2011) considered the ability to coordinate inter-organizational relationships effectively as one of the important resources of the firms.

Chong and Chan (2011) and Gharakhani *et al.* (2012) findings indicate that firms would achieve a higher level of organizational performance if they have well-developed SSP.

2.1.2 Customer relationship practices (CRP). Customer relationship management (CRM) systems are in place in firms in practice with a focus on the customer needs, requirements, and customer satisfaction as it is determined by the extent to which a product or service meets expectations (Oliver, 1980; Gupta and Zeithaml, 2006; Xue *et al.*, 2013). CRM has always been widely regarded for developing and retaining customers through their increased satisfaction and loyalty (Ranjan and Bhatnagar, 2010). CRP is defined as the practice to manage customer complaints, build long-term relationships with customers, and improve customer satisfaction (Tan *et al.*, 1998). Close CRP allows an organization to differentiate its product from competitors and dramatically extend the value it provides to its customers and sustain customer loyalty through customer satisfaction (Cox, 2004; Dadzie and Winston, 2007). The ability to learn from customers and integrate with customers is a unique form of firm capability. The ability to respond to customers' changing demands also helps firms create new products and processes. Therefore, maintaining good CRP and

getting customer feedback represents valid dimensions of SCMP. Therefore, customer relation practices can bring significant impact in managing the total value chain entities across the SC in order to improve the performance of the total SC. (Noble, 1997; Tan *et al.*, 1999; Cook *et al.*, 2011; Gharakhani *et al.*, 2012).

2.1.3 Information sharing (IS). IS refers to the extent to which critical and proprietary information is communicated among SC members with regard to market, product, and customer information (Mentzer *et al.*, 2001; Li and Lin, 2006). Angeles *et al.* (2001), Cagliano *et al.* (2003), Lamming (1996), Stuart and McCutcheon (1996), Chopra and Meindl (2007), Min and Mentzer (2004), Sheu *et al.* (2006), Lee and Whang (2001), Cao and Zhang (2011), and Wu *et al.* (2006) conceptualized information exchange as one of the constructs representing SC capabilities. The effort in providing information and making it visible to other parties in the SC allows for faster and accurate business decisions that translates as a source of competitive advantage (Moberg *et al.*, 2002). As such, IS regarded as the terminator of “bullwhip effect” (Fiala, 2005) that reduces the total cost of the SC in delivering efficient SCP (Gavirneni, 2006). Larson and Kulchitsky (2008) suggest that IS has a central role in SCM.

IS has been cited as one of the major means to enhance SC performance which leads to SC profitability (Baihaqi and Sohal, 2012). IS impacts the SC performance in terms of both total cost and service level (Zhao *et al.*, 2002; Gharakhani *et al.*, 2012). According to the study of Chong *et al.* (2011) IS ($\alpha = 0.790$) has the second highest influences on organizational and innovation performance.

2.1.4 IQ. IQ refers to the extent to which the information flow and exchange is accurate, timely, adequate, and credible (Li and Lin, 2006). Numerous studies (Li and Lin, 2006; Lyons *et al.*, 2004; Moberg *et al.*, 2002) have shown that well-managed IQ within and across the organization will directly lead to improved SCP. Further, Forslund and Jonsson (2007), through their recent research, have indicated that different IQ deficiency could impact the usefulness of forecast and its ability to influence SCP. Hence, this will also provide managers to make precise business decision for effective management of the SC (Raisinghani and Meade, 2005). The information exchange about innovative products and processes with suppliers enables a buying company to reduce product development time and cost and to focus on critical work (Kim *et al.*, 2012).

Similarly, a study by Hsu *et al.* (2009) shows that inter-organizational IS quality has a positive impact on the SC integrated performance, and that IS quality should be multidimensional in terms of accuracy, timeliness, adequacy, and credibility of information exchanged (Ibrahim and Ogunyemi, 2012). Business practices facilitated by information strategies could potentially ensure the quality and improvement in organizational performance. It is evident that IT/information systems IQ has become a high value-adding enabler for organizational performance in today’s aggressively competitive business (Mandal and El-Houbi, 2009).

Many studies as mentioned above highlight the positive relation between quality of IS and ultimate SC profitability. Li and Lin (2006) and Trkman *et al.* (2010) have identified that higher levels of SCM practice such as a higher level and quality of IS can lead to an enhanced competitive advantage and improved performance.

2.1.5 Postponement practices (PP). PP is defined as the practice of moving forward one or several operations or activities to a much later point in the SC (Beamon, 1998). Increasingly, PP has become a manufacturing strategy at the firm level (Yeung *et al.*, 2007). PP enables an organization to meet a high level of product customization through production flexibility (Hoek *et al.*, 2001). Inventories are kept undifferentiated for a certain period until customer demand is certain. Hence, this enables an organization to be highly responsive towards change in customer demand (Li *et al.*, 2005, Li and Lin, 2006).

Postponement has been widely accepted as an effective technique for improving the trade-off between cost and customer service in the face of increasing product variety, the need for quick response to customers' needs, and a shortening of the product life cycle, all of which increase the complexity of demand forecasting and planning (Zinn and Bowersox, 1988; Feitzinger and Lee, 1997; Twede *et al.*, 2000; Battezzati and Magnani, 2000; Yang and Burn, 2003; Christopher *et al.*, 2007; Youn *et al.*, 2011; Choi *et al.*, 2012).

Youn *et al.* (2011) compared the translating implementation of manufacturing POS to service POS and its benefit to members of the SC in total. Overall, PP can reduce inventory cost along the SC and can eventually increase SCP (Yang *et al.*, 2007). Postponement may be applicable in many industries. Yet the specific customization level and the extent to which postponement is applied can vary, from the literature few studies were found dealing with the different PP; however, the literature does not indicate substantial studies of implementation of postponement as SC practices. Henceforth the impact of PP on organizational performance is not investigated.

2.1.6 Lean retailing strategies (LRS). Lean principles and practices have been widely adopted by many companies since the early 1990s (Li *et al.*, 2012). LRP practices of eliminating waste (cost, time, etc.) in a manufacturing system, characterized by reduced set-up times, small lot sizes, and pull production. Adhikari and Yamamoto however propose that with lean retailing, the critical factor becomes on time delivery, not price (Ibrahim and Ogunyemi, 2012). But the emphasis on lean SC has resulted in reduced inventory and increased order of small quantities (Mathew, 2012).

In *Lean Thinking* written by Womack and Jones (1996), five principles are identified as fundamental to the elimination of waste:

- (1) specify what does and does not create value from the customer's perspective;
- (2) identify all the steps necessary to design, order, and produce the product across the whole value stream to highlight non-value-adding waste;
- (3) make those actions that create value flow without interruption, detours, backflows, waiting, or scrap;
- (4) only make what is pulled by the customers just-in-time; and
- (5) strive for perfection by continually removing successive layers of waste as they are uncovered.

Following these principles, internal lean practices may include set-up reduction; pull production, short lead times from suppliers, streamlining ordering, receiving and other paperwork and continuous quality improvement. Value in the lean philosophy is only the activity that is done to the product and that the customer pays for (customer's perspective). Wastes can be in the form of manufacturing waiting times, transportation, excess motion, inventories, overproduction, and defects. Various theories have been developed on the extinction of these wastes. Examples range from find it fix it using lean suppliers, stopping unnecessary waiting times, warehouse optimization, and vehicle routings (Mathew, 2012).

Lean strategies delivers what companies really need in today's highly competitive world – shorter lead times, improved quality, reduced cost, and increased profit, improved productivity and better customer service (Kashyap, 2011). The term “lean” embodies a system that uses less of all inputs to create outputs similar to the mass production system, but offer, an increased choice to the end customer. The logic behind lean thinking in SCM is that organizations jointly identify the value stream for each product from concepts to consumptions and optimize this value stream regardless of traditional, functional, or corporate boundaries (McIvor, 2001).

Sahay *et al.*, (2006) studied the current state of SCMP followed by Indian organizations in an attempt to identify the important areas that need to be addressed in order to gain competitive advantage. The findings reveal that most of the Indian organizations have aligned their SC objectives with their business objectives. They are now on aligning their processes and management focus. The author concludes that the enhanced level of competitiveness would require Indian organizations to manage the three-dimensional (SC objectives, SC processes, and management focus on SC activities) alignment.

2.2 Supply chain performance measures (SCPM)

The literature of SCM was born out of its practical positive impact on firm performance. Early research used to report anecdotal evidence about firms that had adopted the SCM approach and how this resulted in benefits for the firm and other SC members. Great part of this literature was descriptive, reporting practices of successful companies (Miguel and Brito, 2013). Performance indicates the overall efficiency and effectiveness of SCM. The first universal performance measures that were used in SC performance measurement were generated by Pittiglio, Rabin, Todd, and McGrath, widely known as PRTM (Wong and Wong, 2008). Interest in performance measurement and management has notably increased in the last 20 years (Taticchi and Balachandran, 2008; Gopal and Thakkar, 2012).

Nine major dimensions of SCM performance are proposed based on the studies presented in Table III, which encompass three types of performance measurement as suggested by

Supply chain management performance measures	Literature review
<i>Traditional measures</i>	
Supply chain flexibility	Brill and Mandelbaum (1989), Stevenson and Spring (2007), Suarez <i>et al.</i> (1996), Narasimhan and Das (2000), Scannell <i>et al.</i> (2000), Vickery <i>et al.</i> (1999), Beamon (1999), Flynn <i>et al.</i> (2010), Gimenez <i>et al.</i> (2012), Lummus <i>et al.</i> (2005), White <i>et al.</i> (2005), Claycomb <i>et al.</i> (2005), Narasimhan and Jayaram (1998), Malhotra and Mackelprang (2012), Ogunyemi (2012), Stock <i>et al.</i> (1998), Wood (1997), Gosling <i>et al.</i> (2013), Blome <i>et al.</i> (2013)
Supply chain integration	Stock <i>et al.</i> (1998), Narasimhan and Jayaram (1998), Paulraj <i>et al.</i> (2008), Mabert and Venkataraman (1998), Spekman <i>et al.</i> (1998), Fawcett and Magnan (2002), Wood (1997), Flynn <i>et al.</i> (2010), Gimenez <i>et al.</i> (2012)
Responsiveness to customer	Narasimhan and Jayaram (1998), Beamon (1998), Lee and Billington (1992), Christy and Grout (1994), Deshpande (2012), Stevens (1990), Kiefer and Novack (1999), Spekman <i>et al.</i> (1998), Ahn <i>et al.</i> (2011), Holweg (2005), Reichhart and Holweg (2007), Hallgren and Olhager (2009), Danese <i>et al.</i> (2013)
Efficiency	Bagchi and Skjoett-Larsen (2005), Bowersox (1990), Lee <i>et al.</i> (1997), Fisher (1997), Cao and Zhang (2011), Iyer <i>et al.</i> (2009), Parmigiani <i>et al.</i> (2011)
Quality	Gray and Harvey (1992), Li and Lin (2006), Garvin (1984), Cao and Zhang (2011), Neely <i>et al.</i> (1995), Gunasekaran and Kobu (2007)
Product innovation	Tung (2012), Chitakornkijasil (2012), Patel and Jayaram (2013)
Market performance	Shin <i>et al.</i> (2000), Buzzell <i>et al.</i> (1975), Tan <i>et al.</i> (1999), Venkatraman and Ramanujan (1987), Deshpande (2012)
<i>Relationship measures</i>	
Partnership quality	Lee and Kim (1999), Wilson and Vlosky (1998), Fynes <i>et al.</i> (2004, 2005), Zaheer and Venkatraman (1995), Ryu <i>et al.</i> (2007), Lahiri and Kedia (2009), Srinivasan <i>et al.</i> (2011), Jap and Anderson (2003), Chadee <i>et al.</i> (2011), Claro <i>et al.</i> (2003), Lee (2001), Raman <i>et al.</i> (2013).
Supplier performance	Krause <i>et al.</i> (2000), Lemke <i>et al.</i> (2003), Prahinski and Benton (2013), Modi and Mabert (2007), Kotabe <i>et al.</i> (2003), Marksberry (2012), Johnston <i>et al.</i> (2004), Cousins <i>et al.</i> (2008), Stouthuysen <i>et al.</i> (2012).

Table III. Chronological literature on supply chain performance measures

Beamon (1999): relationship measures (supplier performance (output measure), partnership quality)) and traditional measures (efficiency, quality, SC flexibility (flexibility measure)), SC integration (resource measure), product innovation, customer responsiveness (output measure), supplier responsiveness, market performance and SC integration. These constructs are further classified as traditional measures and relationship measures of SCPM.

Traditional measures: performance measurement typically relies on functionally focused financial measures. For the most part, financial accounting measures tend to be historically oriented and do not provide a forward-looking perspective. They also typically do not relate to important strategic non-financial performance measures, such as customer service, loyalty, and product quality, and do not tie directly to operational effectiveness and efficiency. Within such traditional frameworks, each functional area measures its performance on its own terms, with individuals being evaluated based on their ability to meet objectives consistent with department (or at best, process) measures. When each functional area establishes its performance in isolation, it often leads to silos and conflicting organizational goals. The same is the case with organizations that establish functional and process performance measurement systems in isolation from the other (Kamauff and Smith, 2004).

Relationship measures: relationship measures are basically termed as the non-financial measures or soft measures, which are generally non-quantifiable in nature but off late these non-quantifiable measures, which are qualitative in format are raising awareness of the performance potential of chains. A considerable number of authors including Neely *et al.* (1994, 1995), Beamon (1998, 1999), Christopher (1998), Li and O'Brien (1999), Gunasekaran *et al.* (2001), Lambert and Pohlen (2001), and Van Der Vorst (2006) endorse to the need of such relationship key issues to be addressed in supply chain performance measurement. This suggests that relationship measures should be included in chain performance measurement instrument as possible performance determinants. Still, relationship measures are not extensively included into chain performance measurement (Molnár and Gellynck, 2009). Table III provides the chronological literature on supply chain performance measures.

2.2.1 Supply chain flexibility (SCF). Although research on SCF has become increasingly widespread, the view of SCF as an integrated concept has been a fairly recent phenomenon. Vickery *et al.* (1999) were among the first to extend the concept of total system flexibility (Brill and Mandelbaum, 1989) to the SC. However, despite the inherent systemic nature of SCF (Stevenson and Spring, 2007), much of the extant literature has avoided viewing it as a system and instead focused in a limited fashion on evaluating the impact of suppliers (Suarez *et al.*, 1996; Narasimhan and Das, 2000; Scannell *et al.*, 2000), the impact of inter-organizational information systems (White *et al.*, 2005), and the impact of marketing factors (Claycomb *et al.*, 2005) on focal firm flexibility (Malhotra and Mackelprang, 2012).

Lummus *et al.* (2005) view flexibility as a subset of agility, and in a study of expert opinions define "SCF" as the ability of a company to adapt its operations and influence their suppliers to accommodate for demand variability and changes needed for new products in a timely manner. Beamon (1999) suggested a framework with three types of performance measures: flexibility, resource, and output. In the view of Ibrahim and Ogunyemi (2012) "flexibility" measures the "effectiveness" of a SC in responding to changes in terms of product design, delivery times, volume, and mix.

2.2.2 Supply chain integration (SCI). SCI is defined as the extent to which all activities within an organization and the activities of its suppliers, customers, and other SC members are integrated together (Stock *et al.*, 1998; Narasimhan and Jayaram, 1998; Wood, 1997). The SCI construct is relatively new as an area of research, although there is an extensive body of research on unidimensional SC relationships, examining collaborative relationships between a manufacturer and either its customers or suppliers (Paulraj *et al.*, 2008; Mabert and Venkataramanan, 1998; Spekman *et al.*, 1998; Fawcett and Magnan, 2002). While some focus on dyadic relationships with SC partners (Lee and Whang, 2001), others focus on managing

a SC as a single system, rather than attempting to individually optimize fragmented subsystems (Vickery *et al.*, 2003; Naylor *et al.*, 1999; Bowersox and Morash, 1989; Hammer, 1990; Stevens, 1989). While some SCI definitions emphasize flows of materials and parts, others focus more on flows of information, resources, and cash. Although these descriptions touch many of the critical elements of SCI, they are broad in focus. In addition, most fail to consider the strategic nature of SCI (Flynn *et al.*, 2010)

2.2.3 Responsiveness to customers (RTC). RTC is defined as the speed of an organization's response to the customer requests (Narasimhan and Jayaram, 1998; Beamon, 1998). The performance of SCM must ultimately be measured by its RTC (Lee and Billington, 1992). Customer responsiveness has also been recognized as an important dimension of supply chain performance measure (Christy and Grout, 1994; Deshpande, 2012). Customer responsiveness has been recognized as one of the principal aims of SCMP (Stevens, 1990; Kiefer and Novack, 1999; Spekman *et al.*, 1998).

With the proliferation of product varieties and the increased volatility of the global marketplace, RTC requests is today a key competitive factor in the business environment. A responsive company is able to respond to short-term demand changes from the customer (Holweg, 2005; Reichhart and Holweg, 2007). Hallgren and Olhager (2009) consider responsiveness as the simultaneous achievement of flexibility and delivery performance (Danese *et al.*, 2013).

2.2.4 Efficiency. Efficiency refers to the extent to which a firm's collaboration process with SC partners is cost competitive among the primary competitors (Bagchi and Skjoett-Larsen, 2005). The process could be IS process, joint logistics process, joint product development process, or joint decision-making process. Efficiency is a measure of success and a determinant factor of the ability of the firm to profit (e.g. inventory turnover and operating cost). SC collaboration facilitates the cooperation of participating members along the SC to improve performance (Bowersox, 1990). The benefits of collaboration include cost reductions and revenue enhancements (Lee *et al.*, 1997; Cao and Zhang, 2011). The purpose of efficiency in SCs is to coordinate the flow of materials and services and thereby minimize inventory and maximize efficiency of the manufacturers and service providers in the chain (Fisher, 1997). Predictable demand for functional products permits high capacity utilization and minimal inventories in both the firm and its SC partners, while simultaneously offering high service levels to cost-oriented customers (Iyer *et al.*, 2009; Parmigiani *et al.*, 2011).

2.2.5 Quality. Quality refers to the extent to which a firm with SC partners offers quality product that creates a higher value for customers (Gray and Harvey, 1992; Li and Lin, 2006). It is expected that firms that can respond fast to customer needs with high-quality product and innovative design, and excellent after-sales service allegedly build customer loyalty, increase market share, and ultimately gain high profits. Garvin (1988) proposes eight dimensions of quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality, which are comprehensive but measures for each are difficult to establish (Cao and Zhang, 2011). Neely *et al.* (1995) listed quality as an important measure of operational performance (Flynn *et al.*, 2010). In several studies, quality has been considered as the most important part of the value in a SC (Johansson *et al.*, 1993; Naylor *et al.*, 1999). From the literature it was seen that quality is one of the main components of performance that it measured SC performance in connection with the sub-processes (Behrouzi and Wong, 2011).

2.2.6 Product innovation. Product innovation is the introduction of a new product in the market that uses different technology and has a higher utility for the consumer than the existing products (Chitakornkijsil, 2012). Product innovation not only includes the number of unique product classes in a firm's product portfolio but also the number of unique product varieties within each product class (Patel and Jayaram, 2013). A firm's performance is

dependent on product innovation that increases its market power as well as its capacity to cope with market conditions. Product innovation enhances a firm's leverage in a highly competitive market. It increases consumer loyalty and satisfies a wide range of consumer needs since they are presented with a variety of products to choose from. Innovative products earn a firm super profit in the short run that declines over time as follower firms imitate the new product. Firms have to maintain innovativeness especially for complementary products that generate interdependence in the market. Product innovation also increases the capacity of a firm to adapt to a constantly changing environment and hence is significant for a firm's survival (Tung, 2012).

2.2.7 Market performance. Market performance is defined in terms of sales growth, market, and product development (Tan *et al.*, 1999; Venkatraman and Ramanujan, 1987; Deshpande, 2012).

2.2.8 Relationship measures. Besides this, chains belonging to different sectors may have different characteristics such as varied chain length, variation in the closeness of chain relationships, and types of process links (Lambert and Cooper, 2000). These may influence their performance within the integrated SCs; hence it is pertinent to measure the intangible yet important relationships among the SC partners. One of the critical aspects of the SCM is supplier relations at the upstream and customer relations at the downstream. The relationship measures not only include the binding relations including communications, type of relations, and trust among the SC partners.

2.2.9 Partnership quality. Partnership quality is defined as how well the outcome of a partnership matches the participants' expectation (Lee and Kim, 1999; Wilson and Vlosky, 1998). A good partnership quality between the buyer and its supplier is based on mutual trust, joint problem solving, and fulfillment of prespecified promises, helps in avoiding complex and lengthy contracts, that are costly to write and difficult to monitor and enforce (Fynes *et al.*, 2004, 2005; Zaheer and Venkatraman, 1995). A good partnership quality is a crucial precursor for any stable exchange relationship which ensures the relationship continuity (Jap and Anderson, 2003).

Partnership quality has been identified as one of the key factors which allow offshore service providers in India to be competitive (Chadee *et al.*, 2011; Lahiri and Kedia, 2009). The partnership concept relies on the principle of joint, mutually dependent actions resulting in improved performance for both the buyer and the seller based on trust, business understanding, conflict management, and commitment (Claro *et al.*, 2003; Lee, 2001; Lee and Kim, 1999; Raman *et al.*, 2013).

2.2.10 Supplier performance. Suppliers' consistency lies in delivering materials, components, or products to the focal firm on time and in good condition. Supplier performance is often viewed as one of the leading contributors to enhance an organizations competitive advantage (Lemke *et al.*, 2003; Marksberry, 2012). Suppliers represent a critical resource to a firm providing both direct and indirect materials and services, which are inputs to the organization's product offerings. The quality and cost of a product or service offered in the market is a function, not only of the capabilities of the firm, but also of the network of suppliers who provide inputs to the enterprise. When an organization finds its suppliers lacking in performance it can help suppliers to develop their capabilities. There is strong evidence that organizations today are increasingly implementing supplier development programs to improve supplier performance and remain competitive (Modi and Mabert, 2007).

Previous measures of supplier performance indicate that buyers have a variety of intentions for their relationships with suppliers (Johnston *et al.*, 2004), including service quality or speed of service delivery. To maintain effective relationships "the buyer must continuously monitor supplier performance across multiple dimensions" (Cousins *et al.*, 2008; Stouthuysen *et al.*, 2012).

2.3 SCMP and supply chain performance measures

SCMP have been documented in measurement studies as well in research explored the relationship of SCMP and SC profitability. Recent studies have begun to propose SCMP as a multidimensional concept that covers upstream, internal, and downstream side of a SC (Li *et al.*, 2005; Salhieh, 2011). The best SC practices are the initiatives that influence the whole SC, its parts, or key processes (Cuthbertson and Piotrowicz, 2008; Singh *et al.*, 2010; Gawankar *et al.*, 2013).

The major challenge faced by researchers in the SC literature is to analyze the SC system's performance (Akyuz and Erkan, 2010; Beamon, 1999). Often vague terms, such as "adequate" or "inadequate" are commonly used to quantify performance measures (Beamon, 1999). The analysis of SC performance becomes complex because of the different entities involved such as suppliers, manufacturers, wholesalers, and customers. For the purpose of this research, supply chain performance measure is defined as the multiple measures of performance developed by the organization to gauge the ability of a SC to meet an organization's long-term and short-term objectives (Deshpande, 2012). Many papers discussing supply chain performance measure make fleeting or inferential references to the significance of cultural fit in achieving increased and sustained performance but most do not focus specifically on or develop the concept (Barringer and Harrison, 2000; Cousins *et al.*, 2008; Jia and Lamming, 2013; Prahinski and Benton, 2013; Cadden *et al.*, 2013).

Organizations implementing SCM have obtained improved performance. Cost savings, increased revenues, and the reduction of defects in products are some of the chief advantages of introducing SCM (Shin *et al.*, 2000). It has been demonstrated that business profitability is closely associated with market and business shares (Buzzell *et al.*, 1975). On the basis of long-term and short-term goals of the SCM, the organizational performance measures identified were financial and market performance and customer satisfaction, return on investment. In the context of SCM, the financial and market performance is operationalized in terms of market share, return of total assets, and annual sales growth (Tan *et al.*, 1999; Venkatraman and Ramanujan, 1987). Companies can enhance their SC performance by improving the current practices by focusing on the determinants that significantly influence SCM performance. The above arguments lead to:

H1. The higher the level of SCMP, the higher the level of SC performance measures.

2.4 Proposed SEM model

The proposed hypothesis is represented by a causal relationship. *H1* is represented by the relationship β_1 (SCMP \geq SCPM). Supply chain performance measure (SCPM) is dependent on SCMP (Figure 1):

$$\eta_2 = \beta_1 \eta_1 + \delta_1 \quad (1)$$

where η_2 is the SCPM, η_1 the SCMP, β_1 the *H1* (SCMP \geq SCPM), δ_1 the error/disturbance.

3. Methods

The empirical objective of this study is to identify the dimensional structure underlying SC practices and supply chain performance measures and to develop reliable and valid scales to represent it and further hypothesized that a positive relationship exists among the variables. We adopted a comprehensive, multistep approach (Figure 2) during the development and validation process, followed by several studies in operations management (Koufteros *et al.*, 1998; Nahm *et al.*, 2003). Each of the steps is described briefly below.

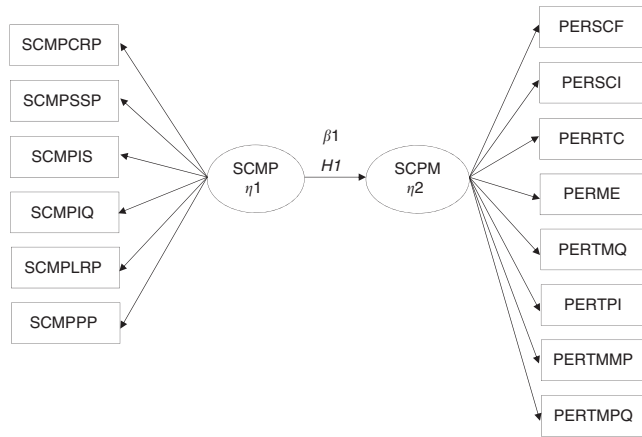


Figure 1.
Proposed structural
equation modelling

3.1 Instrument development

A two-phase research methodology was used for this study. An effective instrument should cover the content domain of each construct (Nunnally, 1978; Churchill, 1979). The items that measure a construct should agree (converge) with each other, and the items of one construct should disagree (discriminate) with the measures of the other constructs. Each construct should be reliable and short and easy to use. Scale development and refinement is a two-phase approach. In the first phase, the definitions of the constructs as well as the measurement items for each construct were established. In this phase, a tentative indication of reliability and validity was also provided. This phase included item generation, pre-pilot study, and pilot study.

In the second phase, the scale has further refined and has validated the measures using large-scale survey data based on the scales developed in the first phase. A survey instrument was developed in order to test the research model. Although the items and questions in the proposed questionnaire were adopted from existing studies, the questionnaire was pretested with several experts from the retail sector to ensure that the wording and format of the questions were appropriate.

3.2 Sample size and characteristics

The field study was carried on a sample of 213 operations and SC practitioners working with organized retail stores in India. This study selected respondents who were expected to have the best knowledge about the operation and management of the SC in the organized retail sector. On the basis of the literature and recommendations from practitioners, it was decided to select operations head that are at higher managerial levels as respondents for the present study. Figure 2 indicates the step by step sequence of activities used in the study. The sample size depends on statistical tool as SEM is used in this study. Sample size is decided based on two conditions: ($N > p$)

Here N is the number of sample and p is the observed variables (Schermelele-Engel and Moosbrugger, 2003); and with three more indicators per factor a sample of 213 is sufficient for convergence and proper solution (Iacobucci, 2010). Hence total samples of 213 respondents are considered, as the number of observed variable is 113.

3.3 Pilot survey

3.3.1 Content validity. Content validity depends on how well the researchers create measurement items to cover the domain of the variable being measured (Nunnally, 1978).

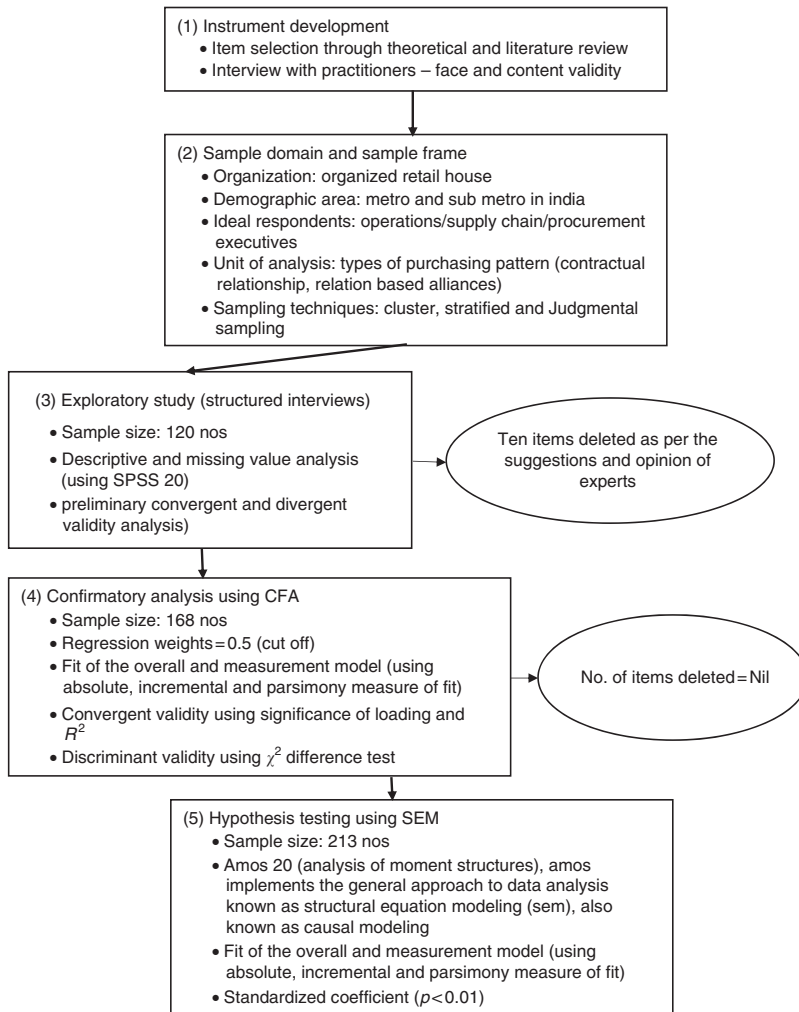


Figure 2. Schematic representation of steps

The evaluation of content validity is a rational judgmental process not open to numerical evaluation. The usual method of ensuring content validity is an extensive review of literature for the choice of the items and getting inputs from the practitioners and academic researchers on the appropriateness, completeness, etc.

The measurement properties of the six dimensions of SCMP, and nine supply chain performance measurement construct (broadly classified into: traditional measures and relationship measures) were evaluated by assessing the key components of construct validity. As per the guidelines of Bagozzi (1980) and Bagozzi and Fornell (1982), the following measurement properties were considered important for assessing the measures developed in this research: content validity, internal consistency of operationalization (unidimensionality and reliability), convergent validity, and discriminant validity.

An instrument has content validity if there is a general agreement among the subjects and researchers that the instrument has measurement items that cover all important aspects of the variable being measured. Unidimensionality indicates that all of the items are measuring a single theoretical construct. Reliability values indicate the degree to which operational measures are free from random error and measure the construct in a consistent manner. Convergent validity is about the extent to which there is consistency in measurements across multiple operationalizations (Campbell and Fiske, 1959). Discriminant validity refers to the independence of the dimensions (Bagozzi *et al.*, 1991), i.e. the extent to which measures of the five constructs are distinctly different from each other. The measurements were measured on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Figure 2 indicates the schematic representation of steps followed during scale development and validation and hypothesis testing.

The sample composition for exploratory study included the operational/SC heads of leading retail organizations and academicians from India. A structured interview was conducted with ten operational heads and ten academicians from top B-Schools and reputed universities from abroad. The sample size represented different segments of retail and geographical considerations. The results of the exploratory study are summarized in Table IV. The experts' opinion pertaining to the items included in each construct based on the review of literature and the reasons of any for their deletions are given in Table IV.

From Table IV the identified (SCMP and supply chain performance measure) constructs were represented by multidimensions and subgroup of items and 74 items were reduced to 96 items based on content validity. The dropped items were those where the experts believed were not applicable within the Indian retail industry scenario. Experts point out that supplier performance deals with the ability to respond to and accommodate periods of poor delivery performance, All the six items were dropped during content validity because it was found that similar set of items were captured in other constructs more precisely (Gawankar and Kamble, 2014).

3.3.2 Reliability. The reliability of the measurement scale in the survey was tested using Cronbach's α . Hair *et al.* (1998) suggested that a value of 0.60 and higher is often considered the criterion for internally consistent established factors. Scales reliability is presented in Table V. The Cronbach's α coefficients indicating the internal consistency reliability of the measures for the two constructs of SCMP and SCPM were all above the suggested value of 0.60 (Hair *et al.*, 1998).

The reliability values for all constructs are greater than 0.60, whereas, all other selected variables showed a high reliability of greater than 0.9 in the study. From Table V it is clearly evident that factors such as strategic supplier partnership (SCMPSSP), information quality (SCMPIQ), partnership quality (PERRMPQ), and IS (SCMPIS) score a very high Cronbach's α value thus giving a clear indication that of the internal consistency and reliability of the measures.

Table VI presents the statistical descriptive measures such as the mean, standard deviation, and range of item correlations for the constructs selected in the study.

With the help of Table VI, from the ranges of item to item correlation (R) it is interpreted that the items show high positive correlation with each other, with a significant level of 0.05. The factors which have scored high value of correlation have shown considerable positive range of correlation amongst themselves.

From given the theory-driven approach to construct development, the analytical framework of confirmatory factor analysis (CFA) in SEM provides an efficient means of assessing the consistency of measurement among scale items and of the pre-specified model with its associated network of theoretical concepts (Jöreskog, 1993; Moon *et al.*, 2012).

Coding	Constructs	No. of items (identified from the literature)	Experts opinion	Total of items used for final survey
<i>SCM practises</i>				
SCMPCRP	Customer relationship management	8	As per experts suggestion the customer relation practices provide the critical linkages throughout the supply chain, thus all the items are considered important to serve the objectives. Thus all items are applicable	8
SCMPSSP	Strategic supplier partnership	10	Experts point out that SSP represents the long-term relationship between the organization and suppliers, but with respect to Indian retail industry dependability and quality of the supplier is considered to be similar; thus from the questionnaire SCMPSSP 1 and SCMPSSP 2 is modified into one item, similarly SCMPSSP 5 is removed with SCMPSSP 7 and SCMPSSP 6 as it conveys the analogous meaning of supplier problem-solving strategies	8
SCMPIS	Information sharing	7	From experts point of view information sharing means the information communicated between partners where the accurate, adequate, and timeliness from experts suggestion item SCMPIS 6 and SCMPIS 7 is combined as the replicate adequacy of the information	6
SCMPIQ	Information quality	5	Similarly like information sharing experts refer information quality as accuracy, adequacy, and timeliness among the partners; they suggest combining the SCMPIQ 3 and SCMPIQ 4 as it represents the completeness of the information	4
SCMPLRP	Lean retailing practises	9	Experts consider that LRP represented by the elimination of waste, low inventory, small lot sizes, and JIT delivery. But item SCMPLRP 1, 2, 5, and 6 are not applicable with India context, thus dropped during content validity	5
SCMPPP	Postponement practises	4	Postponements practices are considered as moving forward one or more operations or activities, while are dominantly used in the manufacturing sector. Thus from experts' point of view this SCM practice will not be suitable in the retail context, hence the items are dropped during content validity	-
Total variables		43	Total variables for pilot survey	31
<i>SCM performance</i>				
PERTM	Traditional measures	5	Experts view supply chain flexibility as an integrated concept and in retail sector the lack of research treating supply chain flexibility as an entire system may be considered weak due to conceptual foundations detailing what exactly should be included in the systems view of supply chain flexibility and how it should be measured. Thus for this research work on supply chain flexibility all items were considered	5
PERTMSCF	Supply chain flexibility		In the retail sector supply chain integration (SCI) is one of the most important aspects of SCM. Experts define SCI as the degree to which a firm can strategically collaborate with its SC partners and cooperatively manage intra- and inter-organizational processes to achieve effective and efficient flows of products,	5

(continued)

Table IV. Findings from the exploratory study

Table IV.

Coding	Constructs	No. of items (identified from the literature)	Experts opinion	Total of items used for final survey
PERTMRTC	Responsiveness to customers	3	services, information, money, and decisions to provide the maximum value to the final customer with low costs and high speed. Thus for this research work on supply Chain Integration all items were considered Customer responsiveness is one of the traditional performance measures irrespective of the sector, as Customer responsiveness minimize the amount of time required from the time an order is placed until the time the order is received by the customer, in the Indian retail context customer responsiveness is considered as a perquisite measure for performance measurement, from the literature it reinstates that there are various aspects and dimensions for measuring customer responsiveness; but experts suggested that the mentioned items under customer responsiveness constructs capture the dimensions; hence all items are applicable	3
PERTME	Efficiency	5	The items listed under the efficiency constructs covers stocking ability, transaction capacity, POS, employee ratio, and operating expenses, which are considered to be a required set of item for performance measurement for retail, hence all items are applicable	5
PERTMQ	Quality	4	Quality is a multidimensional measure as it appears to be the most consistent driver of business performance. The dimensions of quality vary as per the need and types of the organization, hence from the literature only those items were selected which are considered to be appropriate for the retail sector in terms of reliability and durability and hence experts considered all the items important	4
PERTMPI	Product innovation	2	Product innovation facilitates the flexibility in product customization as per the requirement, and determining the supply chain performance on the mentioned item was appreciated by the experts with suggested modification.	2
PERTMMP	Market performance	3	Market performance popularly used as the performance measurements variable, as it provides the factual view of the firm in the market. These items provide information about market share, sales thus was suggested by experts as applicable with modification.	3
PERRM PERRMSP	Relationship measures Supplier performance	6	Experts point out that supplier performance deals with the ability to respond to and accommodate periods of poor delivery performance. All the six items were dropped during content validity because it was found that similar sets of items were captured in other constructs more precisely	-
PERRMPQ	Partnership quality	20	Partners make the supply chain complete but how to measure and on what parameters its efficiency and quality can be measured is difficult to determine, being qualitative measure in nature, experts and available literature, reinforced on the importance of relationship measures. On the basis of expert's suggestion from the list of items covering soft parameters such as trust, dependency, satisfaction, reputation etc., parameters were clubbed under one construct named as partnership quality. Four items, namely PERRMPQ1, PERRMPQ10, PERRMPQ11, PERRMPQ12 were dropped	16
Total variables		53	Total variables for pilot survey	43

4. Confirmatory phase: large-scale study

The findings of the Reliability tests are further supported by CFA carried for all the constructs separately. CFA is used to assess the fit of the measuring items for describing the behavior of the unobserved latent variables mentioned above.

Table VII shows the results of CFA analysis and cumulative standard loadings range for the selected constructs shows that all items of the identified constructs are loading with high values. The CFI, GFI, NFI, and RMR values as observed from Table III are found to be satisfactory (> 0.9 for CFI, GFI, NFI and < 0.10 for RMR).

Further, SCMP was conceptualized as a second-order model composed of six constructs and from the six constructs one was dropped after exploratory study. SEM (using AMOS 20) is used to determine whether a higher-order factor model is appropriate for SCMP. The fit statistics for the second-order model were found to be in the accepted range CFI > 0.897 , GFI > 0.802 , NFI > 0.860 and RMR < 0.075 . Similarly, supply chain performance measure was formed by eight constructs; SEM is used to determine whether a higher-order factor model is

Factors	Cronbach's α
Customer relationship management (SCMPCRP)	0.923
Strategic supplier partnership (SCMPSSP)	0.959
Information sharing (SCMPIS)	0.924
Information quality (SCMPIQ)	0.968
Lean retailing practises (SCMPLRP)	0.806
Supply chain flexibility (PERTMSCF)	0.864
Supply chain integration (PERTMSCI)	0.806
Responsiveness to customers (PERTMRTC)	0.668
Efficiency (PERTME)	0.848
Quality (PERTMQ)	0.867
Product innovation (PERTMPI)	0.796
Market performance (PERTMMP)	0.880
Partnership quality (PERRMPQ)	0.925

Table V. Reliability of the measurement instrument used for the study

Factors	No. of items	Mean*	SD*	Range of item to item correlations (R)	Composite mean
Customer relationship management (SCMPCRP)	8	5.99	0.765	0.534** - 0.688**	5.850563
Strategic supplier partnership (SCMPSSP)	8	4.72	1.580	0.525** - 0.912**	3.923239
Information sharing (SCMPIS)	6	5.07	1.309	0.618** - 0.860**	5.143005
Information quality (SCMPIQ)	4	5.27	1.460	0.883** - 0.901**	5.11892
Lean retailing practises (SCMPLRP)	5	5.51	.859	0.192* - 0.715**	5.454085
Supply chain flexibility (PERTMSCF)	5	5.52	.828	0.501** - 0.700**	5.448357
Supply chain integration (PERTMSCI)	5	5.62	0.904	0.268** - 0.540**	5.514131
Responsiveness to customers (PERTMRTC)	3	5.68	0.726	0.299** - 0.554**	5.539812
Efficiency (PERTME)	5	5.80	0.815	0.392** - 0.677**	5.695446
Quality (PERTMQ)	4	5.80	0.847	0.570** - 0.688**	5.664977
Product innovation (PERTMPI)	2	5.81	0.822	0.664** - 0.664**	5.669014
Market performance (PERTMMP)	3	5.52	1.134	0.592** - 0.859**	5.294366
Partnership quality (PERRMPQ)	16	5.46	1.009	-0.030 - 0.705**	5.506526

Notes: **Correlation is significant at 0.05, 0.01 level, respectively (two-tailed)

Table VI. Reliability test findings (all constructs)

appropriate for SCM performance measures. SCPM was conceptualized as a second-order model composed of eight constructs. The fit statistics for the second-order model were found to be in the accepted range CFI > 0.850, GFI > 0.784, NFI > 0.757 and RMR < 0.047; even the relationships were statistically significant as shown in Table III, which provides evidence of unidimensionality of the factor (Hair *et al.*, 1998). This was sufficient to use the items and the constructs for further analysis of the model.

5. Result of the SEM

5.1 Relationship between SCMP and SCPM

SEM is used to test the relationship between the SCMP and supply chain performance measurement (SCPM) at $\alpha = 0.05$, Table VIII presents the regression weights for the various relationships. The relationships are found to be highly significant across the selected constructs of SCMP and SCPM.

The SEM path diagram for the correlations between SCM practices SCMPCRP, SCMPSSP, SCMPIQ, SCMPIS, SCMPLRP and SC performance measures PERSCF, PERSCI, PERRTC, PERTME, PERTMQ, PERTMPI, PERTMMP and PERRMPQ are shown in Figure 3. For achieving simplicity and to overcome the problem of identification and the variables to size ratio while performing SEM analysis, summary constructs are used as proposed by Garver and Mentzer (1999) and Li *et al.* (2005), Li and Lin, (2006).

The results exhibit that all the SCMP measurement items have significant loadings to their corresponding second-order construct, similarly all the SC performance measurement items have significant loadings to their corresponding second-order construct. The relationship between the second-order construct SCMP and SCPM was also found to be significant. Overall, the model has a satisfactory fit with CMIN 455.356, DF 64, CMIN/DF 7.115, RMR 0.063, GFI 0.881, NFI 0.766, and CFI 0.991.

The results of the SEM analysis support the developed hypothesis, which states that:

H1. The higher the level of SCMP, the higher the level of SCM performance.

It was found that the standardized coefficient was statistically significant at $p < 0.01$ (see Table VIII and Figure 3). The hypothesis is accepted which is a reinforcement that the best SC practices are the initiatives that influence the whole SC, its parts, or key processes (Cuthbertson and Piotrowicz, 2008; Singh *et al.*, 2010). SCM is a set of practices utilized to efficiently and effectively integrate all different stages in the SC in order to produce and deliver goods at the right quantities, to the right locations, and at the required time with minimum costs while meeting customer needs (Simchi-Levi *et al.*, 2003).

6. Discussion on the result

6.1 Main findings

This research also determines the direct relationship between SCMP and supply chain performance measures. There seems to be a significant effect and excellent opportunities

Measurement models	Range of standard loadings	CFI	GFI	NFI	RMR	χ^2 (df, p-value)
SCMP	0.455-0.947	0.897	0.802	0.860	0.075	481.333 (142)*
SCPM	0.463-0.927	0.850	0.784	0.757	0.047	945.504 (436)*

Notes: CMIN/df, relative χ^2 ; RMR, root mean square residual; CFI, comparative fit index; GFI, goodness of fit index; NFI, normed fit index. A list of variables (items) pertaining to various sub-scales along with descriptive statistics is given in Table AI. *,***Significant at $p = 0.01$

Sources: James *et al.* (1982) parsimony adjustment to NFI; Hair *et al.* (2010)

Table VII.
Results from
confirmatory
factor analysis
(all constructs)

	Estimate	SE	CR	Regression weights	P
SCPM ← SCMP	0.862	0.099	8.725	0.856	***
SCMPLRP ← SCMP	1.000			0.672	
SCMPIQ ← SCMP	2.761	0.230	12.003	0.950	***
SCMPIS ← SCMP	1.696	0.163	10.428	0.790	***
SCMPSSP ← SCMP	2.881	0.276	10.458	0.793	***
SCMPCRP ← SCMP	0.775	0.103	7.531	0.552	***
PERSCF ← SCPM	1.000			0.717	
PERSCI ← SCPM	0.956	0.103	9.287	0.663	***
PERRTC ← SCPM	0.970	0.092	10.572	0.754	***
PERTME ← SCPM	0.983	0.097	10.131	0.722	***
ERTMQ ← SCPM	1.077	0.109	9.842	0.702	***
PERTMPI ← SCPM	1.152	0.118	9.722	0.693	***
PERTMMP ← SCPM	1.326	0.163	8.111	0.579	***
PERRMPQ ← SCPM	1.198	0.102	11.748	0.838	***

Note: *,***Significant at $p = 0.01$

Table VIII.
Regression weights:
SCMP and SCPM

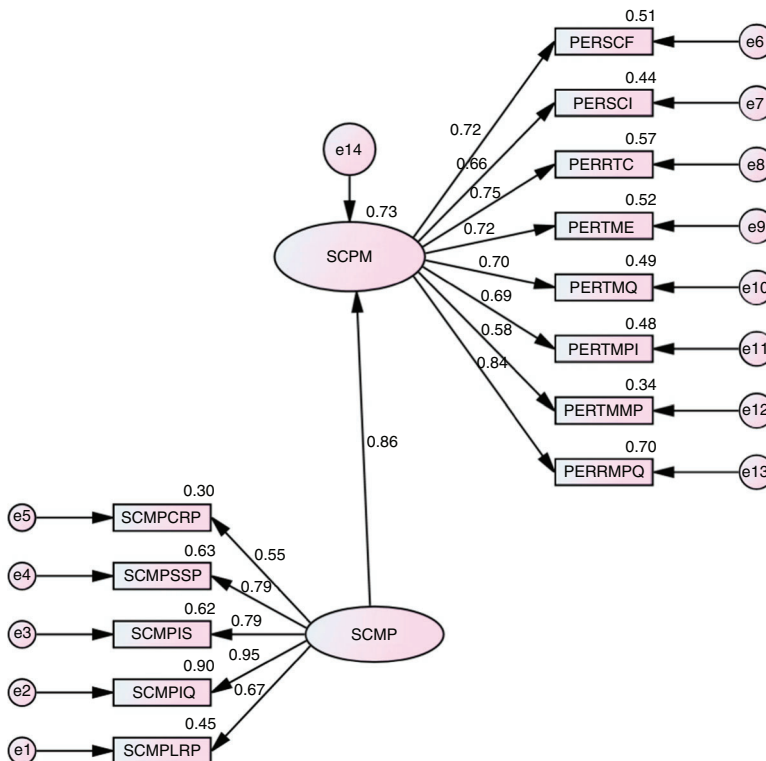


Figure 3.
SEM for SCM practices and supply chain performance measurement (SCPM)

that exist for Indian retail that seeks to implement the identified SCMP. The five SCMP seem to be doing what is expected of them in terms of improved performance.

In this research we identified five practices to represent, the various operational strategies which further leads to efficient functioning of any retail SC. Using a multistep construct development method, we distil the 31 measurement items into five SCMP

out of the five practices, from the calculated squared multiple correlation (R^2), total variance on SCMP constructs was estimated by formulating individual contribution of each practices. It was seen from the R^2 value that the practices with the highest contribution was SCMIQ showing 0.90, SCMSSP with 0.63, and SCMIS with 0.62 of the total variance, while the R^2 values of rest two practices was found to be SCMCRP with 0.30 and SCMPLRP with 0.45.

It was concluded from the R^2 values that in retail managing supplier partnership, IS and quality of the information can add to high level impact not only on SC performance but also on organization accomplishment towards sustainability. On the contrary, practices like SCMCRP showed the lowest value, this could be because of capturing customer perception and implementing the strategies according to the changing needs is difficult as the characteristics of this kind of nature is uncertain, still this practice show 0.30 influence to the total SCMP. While lean practice is yet to gain popularity when compared with its effective implementation across the manufacturing sector, in retail format the focus is more on the sustainability issue, stronger SC than lean strategy implementation, but lean practices application is gaining attention of the retail executives which is reflected from the outcomes of this study as lean retailing practices contribute to 0.45 to the SCMP construct.

Improving SC performance has become one of the critical issues in sustaining competitive advantages for companies. Thus the research work contributes eight dimensions to assess SC performance. From the literature review, out of 53 items from nine constructs 43 items were selected and one construct, i.e. supplier performance was dropped as this measure was covered and leading to ambiguity. From the analysis, it was seen that all the variables were loading high values almost for all the variables regression weights were > 0.5 , even from the value of squared multiple correlation (R^2) the individual contribution of the variables on SCMP was determined with the highest value of 0.70 relationship measure, i.e. partnership quality contributed to a maximum which adds that even relationship measure has a predominant significance in the performance of an SC which is earlier dominated by financial measures only, the other constructs such as SCF = 0.51, SCI = 0.44, RTC = 0.57, ME = 0.52, MQ = 0.49, MPI = 0.48, MMP = 0.34 add to the total variance of SCMP.

Overall, the model has a satisfactory fit with CMIN/DF 3.807, RMR 0.063, GFI 0.972, NFI 0.889, and CFI 0.898. The empirically validated measurement instrument we provide here is useful for the researcher who is interested in conducting survey research related to SCMP and supply chain performance measures within any sector. This research also provides empirical justification for a structural model that identifies positive and significant relationship between SCMP and SCMP within the context of Indian retail sector.

On the basis of the findings it can be implied that in retailing relationship measure, i.e. partnership quality can add to a high level of impact on SC performance which further supports the literature that relationship measures have a predominant significance in the performance of SC which was dominated by financial measures. These intangible measures like partnership quality strengthen the integration of SC which contributes to smooth functioning of the goods and services across the SC stakeholders which help manage the demand and supply at the right quantity and made it available to the customer at the right time. It can be observed from the result that PERRTC loading is the second highest with an R^2 of 0.57 of the total variance as in the retail the customer is the most influential link in the SC comparatively; with the other sector the response time to make the goods or services available to the customer is an important dimension which determines the efficiency of the SC and the outcomes reflect the same that the PERRTC plays a critical role in the supply chain performance measurement. Other constructs ranges between 0.34 (lowest) for PERTMP and 0.52 for PERTME; however, they were found to be statistically significant at $\alpha = 0.01$.

All the eight measures contribute to 50 percent of the total variance with very less variation; thus it is concluded from the result that the identified SC measurement construct when combined with the five identified management practices will ultimately lead to enhance the SC profitability and competitive edge over the competitor.

The empirically validated measurement instrument provided as an outcome of this study is useful for researchers who are interested in conducting survey-based research related to SCMP and supply chain performance measures in any sector. This research also provides empirical justification for a structural model that identifies positive and significant relationship between SCMP and SCPM within the context of Indian retail sector.

6.2 Implications for practitioners

The result of this research has several important implications for practitioners. First, as today's competition is moving from among organizations to between SCs, more and more organizations are increasingly adopting SCMP, in the hope of reducing SCM cost and increase efficiency and performance of the SC. The findings of this research assure practitioners that SCM is an effective way of competing and the implementation of SCMP does have strong impact on the SC performance.

Second, the research identifies the key dimensions of SCMP that an organization can adopt. Just as pointed out by Monczka and Morgan (1997), SCM has been poorly defined and there is a high degree of variability in people's mind about its meaning. Many organizations still consider SCM as being the same as integrated logistics management (Van Hoek, 1998; Alvarado and Kotzab, 2001) or as a synonym of supplier management (Lamming, 1996; Banfield, 1999). Even though organizations have realized the importance of implementing SCM, they often do not know exactly what to implement, or just focus on the part of SCMP issues. The findings demonstrate to the practitioners that the SCMP should focus on building SSP improving customer relationship, sharing high-quality information with the SC partners, and implementing lean system and other strategies.

Third, the research provides a set of valid and reliable measurements for evaluating an organization's level of SCM performance. Although there are numerous studies discussing the measurement of SCM, they either are oriented towards economic metrics, internal function, or just focus on certain dimensions of SCM performance. The measurements developed in this research capture the different aspects (including tangible and intangible factors) of SCM performance, and thus can be considered a better measure for SCM performance. These measures can be used by practitioners not only to evaluate the immediate outcome of their SCMP, but also to understand the impacts of SCM performance.

Fourth, the results highlight the critical role of SCMP on improving performance. The research also supports the stated hypothesis:

H1. The higher the level of SCMP, the higher the level of SCM performance.

The empirical findings on these relationships have added significantly to the current body of knowledge in SCM field.

Overall, the findings verify the strategic role of SCM for an organizations survival in today's competing business environments. The implementation of various SCMP will lead to improved SCM performance. The findings also indicate the significant relationship of all the constructs.

7. Conclusion

The results of the research will help the decision makers in the SC/procurement field to understand the importance on the association between SCMP and supply chain performance measures. Statistical tests show that implementation of SCMP is associated with supply

chain performance measures, which leads to the overall improvements; also there is a statistically significant association between the five SCMP and eight SCPM. The results discussed in the research are important since they represent the relationship between SCMP (lean retailing strategies (SCMPLRP), IS (SCMPIQ), information quality (SCMPIS), strategic supplier partnership (SCMPSSP) and customer relationship practices (SCMPCRP)) and SCPM (supply chain flexibility (PERTMSCF), supply chain integration (PERTMSCI), responsiveness to customers (PERTMRTC), efficiency (PERTME), quality (PERTMQ), product innovation (PERTMPI), market performance (PERTMMP), and partnership quality (PERRMPQ)) that diverts the perception of practicing managers. These two constructs should be taken into account when strategies are formed or implemented for the growth of the organization to sustain in the competitive fast changing environment. From the results it can be mentioned that these measures will provide a good guide to managerial decision-making processes.

Further most, this research is also needed to provide more understanding about the SCMP along with the supply chain performance measures and the positive association among them. Overall, this research provides additional insight into the growing field of the relationships between SCMP and performance measures. Clearly, the field has ample space to grow in terms of research and practice.

References

- Aggarwal, S. (1997), "Flexibility management: the ultimate strategy", *Industrial Management*, Vol. 39 No. 1, pp. 26-31.
- Ahn, J., Khandelwal, A. and Wei, S. J. (2011), "The role of intermediaries in facilitating trade", *Journal of International Economics*, Vol. 84, pp. 73-85.
- Akyuz, G.A. and Erkan, T.E. (2010), "Supply chain performance measurement: a literature review", *International Journal of Production Research*, Vol. 48 No. 17, pp. 5137-5155.
- Alvarado, U.Y. and Kotzab, H. (2001), "Supply chain management: the integration of logistics in marketing", *Industrial Marketing Management*, Vol. 30 No. 2, pp. 183-198.
- Alvarez-Gil, M.J. (1994), "Capital budgeting and flexible manufacturing", *International Journal of Production Economics*, Vol. 36 No. 1, pp. 109-128.
- Angeles, R., Corritore, C.L., Basu, S.C. and Nath, R. (2001), "Success factors for domestic and international electronic data interchange (EDI) implementation for US firms", *International Journal of Information Management*, Vol. 21 No. 5, pp. 329-347.
- Arnold, S.J. (2002), "Lessons learned from the world's best retailers", *International Journal of Retail and Distribution Management*, Vol. 30 Nos 11/12, pp. 562-570.
- Azadegan, A., Pankaj C., Patel, P.C., Zangouinezhad, A. and Linderman, K. (2013), "The effect of environmental complexity and environmental dynamism on lean practices", *Journal of Operations Management*, Vol. 31 No. 4, pp. 193-212.
- Azar, A., Kahnali, R.A. and Taghavi, A. (2010), "Relationship between supply chain quality management practices and their effects on organisational performance", *Singapore Management Review*, Vol. 32 No. 1, pp. 45-68.
- Bagchi, P.K. and Skjoett-Larsen, T. (2005), "Supply chain integration: a European survey", *The International Journal of Logistics Management*, Vol. 16 No. 2, pp. 275-294.
- Bagozzi, R.P. (1980), *Causal Model in Marketing*, John Wiley and Sons, New York, NY.
- Bagozzi, R.P. and Fornell, C. (1982), "Theoretical concepts, measurements and meaning", *A Second Generation of Multivariate Analysis*, Vol. 2 No. 2, pp. 5-23.
- Bagozzi, R.P., Yi, Y. and Phillips, L.W. (1991), "Assessing construct validity in organizational research", *Administrative Science Quarterly*, Vol. 36 No. 3, pp. 421-458.

- Baihaqi, I. and Sohal, A.S. (2012), "The impact of information sharing in supply chains on organizational performance: an empirical study", *Production Planning and Control: The Management of Operations*, Vol. 24 Nos 8-9, pp. 743-758.
- Bala, H. (2013), "The effects of IT-enabled supply chain process change on job and process outcomes: a longitudinal investigation", *Journal of Operations Management*, Vol. 31 No. 6, pp. 450-473.
- Balsmeier, P.W. and Voisin, W.J. (1996), "A supply chain management: a time-based strategy", *Industrial Management*, Vol. 38 No. 5, pp. 24-27.
- Banfield, E. (1999), *Harnessing Value in the Supply Chain*, Wiley, New York, NY.
- Barringer, B.R. and Harrison, J.S. (2000), "Walking a tightrope: creating value through interorganizational relationships", *Journal of Management*, Vol. 26 No. 3, pp. 367-403.
- Battezzati, L. and Magnani, R. (2000), "Supply chain for FMCG and industrial products in Italy practices and the advantages of postponement", *International Journal of Physical Distributions and Logistic Management*, Vol. 30 No. 5, pp. 413-424.
- Beamon, B.M. (1998), "Supply chain design and analysis: models and methods", *International Journal of Production Economics*, Vol. 55 No. 3, pp. 281-294.
- Beamon, B.M. (1999), "Measuring supply chain performance", *International Journal of Operations and Production Management*, Vol. 19 No. 3, pp. 275-292.
- Behrouzi, F. and Wong, K.Y. (2011), "An investigation and identification of lean supply chain performance measures in the automotive SMEs", *Scientific Research and Essays*, Vol. 6 No. 24, pp. 5239-5252.
- Berry, D., Towill, D.R. and Wadsley, N. (1994), "Supply chain management in the electronics products industry", *International Journal of Physical Distribution and Logistics Management*, Vol. 24 No. 10, pp. 20-32.
- Blome, C., Schoenherr, T. and Eckstein, D. (2013), "The impact of knowledge transfer and complexity on supply chain flexibility: a knowledge-based view", *International Journal of Production Economics*, Vol. 147, Part B, pp. 307-316.
- Boddy, D., Macbeth, D. and Wagner, B. (2000), "Implementing collaboration between organizations: an empirical study of supply chain partnering", *Journal of Management Studies*, Vol. 37 No. 7, pp. 1003-1018.
- Bommer, M., O'Neil, B. and Treat, S. (2001), "Strategic assessment of the supply chain interface: a beverage industry case study", *International Journal of Physical Distribution and Logistics Management*, Vol. 31 No. 1, pp. 11-25.
- Bordonaba, V. and Cambra, J. (2009), "Managing supply chain in the context of SMEs: a collaborative and customized partnership with the suppliers as the key for success", *Supply Chain Management: An International Journal*, Vol. 14 No. 5, pp. 393-402.
- Bowersox, D.J. (1990), "The strategic benefits of logistics alliances", *Harvard Business Review*, Vol. 68 No. 4, pp. 36-43.
- Bowersox, D.J. and Morash, E.A. (1989), "The integration of marketing flows in channels of distribution", *European Journal of Marketing*, Vol. 23 No. 20, pp. 58-67.
- Brill, D. and Mandelbaum, M. (1989), "On measures of flexibility in manufacturing systems", *International Journal of Production Research*, Vol. 27 No. 5, pp. 747-756.
- Burgess, R. (1998), "Avoiding supply chain management failure: lesson from business process reengineering", *International Journal of Logistics Management*, Vol. 9 No. 1, pp. 15-23.
- Buzzell, R., Gale, B., Bradley, T. and Sultan, R. (1975), "Market share – a key to profitability", *Harvard Business Review*, Vol. 53, January, pp. 97-106.
- Cadden, T., Marshall, D. and Cao, G. (2013), "Opposites attract: organisational culture and supply chain performance", *Supply Chain Management: An International Journal*, Vol. 18 No. 1, pp. 86-103.
- Campbell, D.T. and Fiske, D.W. (1959), "Convergent and discriminant validation by the multitrait – multi method matrix", *Psychological Bulletin*, Vol. 56 No. 2, pp. 81-105.

- Cao, M. and Zhang, Q. (2011), "Supply chain collaboration: impact on collaborative advantage and firm performance", *Journal of Operations Management*, Vol. 20 No. 3, pp. 163-180.
- Cagliano, R., Caniato, F. and Spina, G. (2003), "Business strategy: how companies are shaping their supply chain through the internet", *International Journal of Operations & Production Management*, Vol. 23 No. 10, pp. 1142-1162.
- Chadee, D., Raman, R. and Michailova, S. (2011), "Sources of competitiveness of offshore IT service providers in India: towards a conceptual framework", *Competition and Change*, Vol. 15 No. 3, pp. 196-220.
- Chen, I.J., Paulraj, A. and Lado, A.A. (2004), "Strategic purchasing, supply management, and firm performance", *Journal of Operations Management*, Vol. 22, pp. 505-523.
- Chen, I.J. and Paulraj, A. (2004a), "Towards a theory of supply chain management: the constructs and measurements", *Journal of Operations Management*, Vol. 22 No. 2, pp. 119-151.
- Chen, I.J. and Paulraj, A. (2004b), "Understanding supply chain management: critical research and a theoretical framework", *International Journal of Production Research*, Vol. 42 No. 1, pp. 131-163.
- Chen, Y.S., Rungtusanatham, M.J., Goldstein, S.M. and Koerner, A.S. (2013), "Theorizing through metaphorical transfer in OM/SCM research: divorce as a metaphor for strategic buyer-supplier relationship dissolution", *Journal of Operations Management*, Vol. 31 Nos 7-8, pp. 579-586.
- Childhouse, P. and Towill, D.R. (2003), "Simplified material flow holds the key to supply chain integration", *Omega - International Journal of Management Sciences*, Vol. 31 No. 1, pp. 17-27.
- Chitakornkijssil, P. (2012), "Moral meaning in green marketing and socially responsible marketing", *International Journal of Organizational Innovation*, Vol. 4 No. 3, pp. 113-128.
- Choi, K., Narasimhan, R. and Kim, S.W. (2012), "Postponement strategy for international transfer of products in a global supply chain: a system dynamics examination", *Journal of Operations Management*, Vol. 30 No. 3, pp. 167-179.
- Chong, A.Y.L., Chan, F.T.S., Ooi, K.B. and Sim, J.J. (2011), "Can Malaysian firms improve organizational/innovation performance via SCM?", *Industrial Management and Data Systems*, Vol. 111 No. 3, pp. 410-431.
- Chong Felix, T.S., Alain, Y.L., Chan, K.B. and Sim, Ooi J.J. (2011), "Can Malaysian firms improve organizational/innovation performance via SCM?", *Industrial Management and Data Systems*, Vol. 111 No. 3, pp. 410-431.
- Chopra, S. and Meindl, P. (2007), *Supply Chain Management: Strategy, Planning, and Operation*, 3rd ed., Prentice Hall Inc., NJ.
- Christopher, A.B., Christopher, W.C. and Hanna, J.B. (2007), "Postponement: an evolving supply chain concept", *International Journal of Physical Distribution and Logistics Management*, Vol. 37 No. 8, pp. 594-611.
- Christopher, M. (1998), *Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service*, Financial Times, London.
- Christy, D.P. and Grout, J.R. (1994), "Safeguarding supply chain relationships", *International Journal of Production Economics*, Vol. 36 No. 3, pp. 233-242.
- Churchill, G.A. Jr (1979), "A paradigm for developing better measures of marketing constructs", *Journal of Marketing Research*, Vol. 16 No. 1, pp. 64-73.
- Claro, D.P., Hagelaar, G. and Omta, O. (2003), "The determinants of relational governance and performance: how to manage business relationships?", *Industrial Marketing Management*, Vol. 32 No. 8, pp. 703-716.
- Claycomb, C., Droge, C. and Germain, R. (1999), "The effect of just-in-time with customers on organizational design and performance", *International Journal of Logistics Management*, Vol. 10 No. 1, pp. 37-58.

- Claycomb, C., Droge, C. and Germain, R. (2005), "Applied customer knowledge in a manufacturing environment: flexibility for industrial firms", *Industrial Marketing Management*, Vol. 34 No. 6, pp. 629-640.
- Cook, L.S., Heiser, D.R. and Sengupta, K. (2011), "The moderating effect of supply chain role on the relationship between supply chain practices and performance: an empirical analysis", *International Journal of Physical Distribution and Logistics Management*, Vol. 41 No. 2, pp. 104-134.
- Cousins, P.D., Lawson, B. and Squire, B. (2008), "Performance measurement in strategic buyer-supplier relationships", *International Journal of Operations and Production Management*, Vol. 28 No. 3, pp. 238-250.
- Cox, A. (2004), "The art of the possible: relationship management in power regimes and supply chains", *Supply Chain Management: An International Journal*, Vol. 9 No. 5, pp. 346-356.
- Cuthbertson, R. and Piotrowicz, W. (2008), "Supply chain best practices – identification and categorization of measures and benefits", *Journal of Productivity and Performance Management*, Vol. 57 No. 5, pp. 389-404.
- Dadzie, K.Q. and Winston, E. (2007), "Consumer response to stock-out in the online supply chain", *International Journal of Physical Distribution and Logistics Management*, Vol. 37 No. 1, pp. 19-42.
- Danese, P., Romano, P. and Formentini, M. (2013), "The impact of supply chain integration on responsiveness: the moderating effect of using an international supplier network", *Logistics and Transportation Review*, Vol. 49 No. 1, pp. 125-140.
- Day, G.S. (2000), "Managing market relationships", *Journal of the Academy of Marketing Science*, Vol. 28 No. 1, pp. 55-66.
- Defee, C.C., Randall, W.S. and Gibson, B.J. (2009), "Roles and capabilities of the retail supply chain organization", *Journal of Transportation Management*, Vol. 21 No. 2, pp. 31-48.
- Deshpande, A. (2012), "Supply chain management dimensions, supply chain performance and organizational performance: an integrated framework", *International Journal of Business and Management*, Vol. 7 No. 8, pp. 1833-1819.
- Devaraj, S., Krajewski, L. and Wei, J.C. (2007), "Impact of ebusiness technologies on operational performance: the role of production information integration in the supply chain", *Journal of Operations Management*, Vol. 25 No. 6, pp. 1199-1216.
- Donlon, J.P. (1996), "Maximizing value in the supply chain", *Chief Executive*, Vol. 117 No. 1, pp. 54-63.
- Ellram, L.M. (1991), "Supply-chain management: the industrial organisation perspective", *International Journal of Physical Distribution and Logistics Management*, Vol. 21 No. 1, pp. 13-22.
- Elmaghraby, W.J. (2000), "Supply contract competition and sourcing policies", *Manufacturing and Service Operations Management*, Vol. 2 No. 4, pp. 350-371.
- Fawcett, S.E. and Magnan, G.M. (2002), "The rhetoric and reality of supply chain integration", *International Journal of Physical Distribution and Logistics Management*, Vol. 32 No. 5, pp. 339-361.
- Feitzinger, E. and Lee, L.H. (1997), "Mass customization at Hewlett-Packard: the power of postponement", *Harvard Business Review*, Vol. 75 No. 1, pp. 116-121.
- Feldmann, M. and Müller, S. (2003), "An incentive scheme for true information providing in supply chains", *Omega*, Vol. 31 No. 2, pp. 63-73.
- Fiala, P. (2005), "Information sharing in supply chains", *The International Journal of Management Science*, Vol. 33 No. 5, pp. 419-423.
- Fisher, M. (1997), "What is the right supply chain for your product? A simple framework – can you figure out the answer?", *Harvard Business Review*, Vol. 75 No. 2, pp. 105-116.
- Flynn, B.B., Huo, B. and Zhao, X. (2010), "The impact of supply chain integration on performance: a contingency and configuration approach", *Journal of Operations Management*, Vol. 28 No. 1, pp. 58-71.

- Forslund, H. and Jonsson, P. (2007), "The impact of forecast information quality on supply chain performance", *International Journal of Operations and Production Management*, Vol. 27 No. 1, pp. 90-107.
- Fynes, B., de Búrca, S. and Marshall, D. (2004), "Environmental uncertainty, supply chain relationship quality and performance", *Journal of Purchasing and Supply Management*, Vol. 10 Nos 4-5, pp. 179-190.
- Fynes, B., de Búrca, S. and Voss, C. (2005), "Supply chain partnership quality: the competitive environment and performance", *International Journal of Production Research*, Vol. 43 No. 16, pp. 3303-3320.
- Ganesan, S., George, M., Jap, S., Palmatier, R.W. and Weitz, B. (2009), "Supply chain management and retailer performance: emerging trends, issues, and implications for research and practice", *Journal of Retailing*, Vol. 85 No. 1, pp. 84-94.
- Garver, M.S. and Mentzer, J.T. (1999), "Logistics research methods: employing structural equation modeling to test for construct validity", *Journal of Business Logistics*, Vol. 20 No. 1, pp. 33-57.
- Garvin, D.A. (1988), *Managing Quality: The Strategic and Competitive Edge*, Free Press, New York, NY.
- Garvin, D.A. (1984), "What does product quality really mean?", *Sloan Management Review*, Vol. 1 No. 3, pp. 25-43.
- Gavirneni, S. (2006), "Price fluctuations, information sharing, and supply chain performance", *European Journal of Operational Research*, Vol. 174 No. 3, pp. 1651-1663.
- Gawankar, S., Kamble, S. and Verma, R. (2013), "Development, measurement and validation of supply chain management practices scale in Indian retail sector", *International Journal Procurement Management*, Vol. 6 No. 5, pp. 495-522.
- Gawankar, S. and Kamble, S. (2014), "Retail revolution and Indian customers: the relationships dynamics", *Banaras Hindu University Management Review*, Vol. 4, Special Issue, July, pp. 20-25.
- Gharakhani, D., Mavi, R.M. and Hamidi, N. (2012), "Impact of supply chain management practices on innovation and organizational performance in Iranian companies", *African Journal of Business Management*, Vol. 6 No. 19, pp. 5939-5949.
- Gimenez, C., Vaart, T.V.D. and Donk, D.P.V (2012), "Supply chain integration and performance: the moderating effect of supply complexity", *International Journal of Operations & Production Management*, Vol. 32 No. 5, pp. 583-610.
- Gopal, P.R.C. and Thakkar, J. (2012), "A review on supply chain performance measures and metrics: 2000-2011", *International Journal of Productivity and Performance Management*, Vol. 61 No. 5, pp. 518-547.
- Gosling, J., Naim, M. and Towill, D. (2013), "A supply chain flexibility framework for engineer-to-order systems", *Production Planning and Control: The Management of Operations*, Vol. 24 No. 7, pp. 552-566.
- Gray, J. and Harvey, T. (1992), *Quality Value Banking: Effective Management Systems that Increase Earnings, Lower Costs, and Provide Competitive Customer Service*, John Wiley and Sons Inc., New York, NY.
- Griffith, D.A. and Harvey, M.G. (2001), "A resource perspective of global dynamic capabilities", *Journal of International Business Studies*, Vol. 32 No. 3, pp. 597-606.
- Gunasekaran, A. and Chung, W.C. (2004), "Supply chain management for the 21st century organizational competitiveness", *International Journal of Production Economics*, Vol. 87 No. 3, pp. 209-212.
- Gunasekaran, A. and Kobu, B. (2007), "Performance measures and metrics in logistics and supply chain management: a review of recent literature (1995-2004) for research and applications", *International Journal of Production Research*, Vol. 45 No. 12, pp. 2819-2840.
- Gunasekaran, A., Patel, C. and Tirtiroglu, E. (2001), "Performance measure and metrics in a supply chain environment", *International Journal of Operations and Production Management*, Vol. 21 Nos 1/2, pp. 71-87.

- Gupta, S. and Zeithaml, V. (2006), "Customer metrics and their impact on financial performance", *Marketing Science*, Vol. 25 No. 6, pp. 718-739.
- Hair, J.F. Jr, Anderson, R.E., Tatham, R.L. and Black, W.C. (1998), *Multivariate Data Analysis*, 5th ed., Prentice Hall, NJ.
- Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2010), *Multivariate Data Analysis*, Seventh Edition., Prentice Hall, Upper Saddle River, NJ.
- Hallgren, M. and Olhager, J. (2009), "Lean and agile manufacturing: external and internal drivers and performance outcomes", *International Journal of Operations and Production Management*, Vol. 29 No. 10, pp. 976-999.
- Hammer, M. (1990), "Reengineering work: don't automate, obliterate", *Harvard Business Review*, Vol. 68 No. 4, pp. 104-112.
- Handfield, R. and Nichols, E. (1999), *Introduction to Supply Chain Management*, Prentice Hall Inc., NJ.
- Hoek, R.I.V., Harrison, A. and Christopher, M. (2001), "Measuring agile capabilities in the supply chain", *International Journal of Operations and Production Management*, Vol. 21 Nos 1/2, pp. 126-147.
- Holmberg, S. (2000), "A system perspective on supply chain measurements", *International Journal of Physical Distribution and Logistics Management*, Vol. 30 No. 10, pp. 847-868.
- Holweg, M. (2005), "The three dimensions of responsiveness", *International Journal of Operations and Production Management*, Vol. 25 No. 7, pp. 603-622.
- Hsu, L.-L., Chiu, C.-M., Chen, J.C. and Liu, C.-C. (2009), "The impacts of supply chain management systems on information sharing and integrated-performance", *Human Systems Management*, Vol. 28 No. 3, pp. 101-121.
- Iacobucci, D. (2010), "Structural equations modeling: fit indices, sample size, and advanced topics", *Journal of Consumer Psychology*, Vol. 20 No. 2, pp. 90-99.
- Ibrahim, S.E. and Ogunyemi, O. (2012), "The effect of linkages and information sharing on supply and export performance: an empirical study of Egyptian textile manufacturers", *Journal of Manufacturing Technology Management*, Vol. 23 No. 4, pp. 441-463.
- Iyer, K.N.S., Germain, R. and Claycomb, C. (2009), "B2B e-commerce supply chain integration and performance: a contingency fit perspective on the role of environment", *Information and Management*, Vol. 46 No. 6, pp. 313-322.
- Jain, A. (2013), "FDI in multi-brand retailing in India: comparative study with China", *International Journal of Management and Information Technology*, Vol. 3 No. 1, pp. 54-61.
- James, L.R., Mulaik, S.A. and Brett, J.M. (1982), *Causal Analysis: Assumptions, Models, and Data*, Sage, Beverly Hills, New York, NY.
- Jap, S.D. and Anderson, E. (2003), "Safeguarding interorganizational performance and continuity under ex post opportunism", *Management Science*, Vol. 49 No. 12, pp. 1684-1701.
- Jarrell, J.L. (1998), "Supply chain economics", *World Trade*, Vol. 11 No. 11, pp. 58-61.
- Jia, F. and Lamming, R. (2013), "Cultural adaptation in Chinese-Western supply chain partnerships: dyadic learning in an international context", *International Journal of Operations & Production Management*, Vol. 33 No. 5, pp. 528-561.
- Johansson, H.J., McHugh, P., Pendlebury, A.J. and Wheeler, W.A. (1993), *Business Process Reengineering: Breakpoint Strategies for Market Dominance*, Wiley, Chichester.
- Johnston, D.A., McCutcheon, D.M., Stuart, F.I. and Kerwood, H. (2004), "Effects of supplier trust on performance of cooperative supplier relationships", *Journal of Operations Management*, Vol. 22 No. 1, pp. 23-38.
- Jones, C., Hesterly, W. and Borgatti, S. (1998), "A general theory of network governance: exchange conditions and social mechanisms", *Academy of Management Review*, Vol. 22 No. 4, pp. 911-945.
- Jöreskog, K.G. (1993), "Testing structural equation models", in Bollen, K.A. and Long, J.S. (Eds), *Testing Structural Equation Models*, Sage, Thousand Oaks, CA, pp. 294-316.

- Kalakota, R. and Robinson, M. (1999), *E-Business: Roadmap for Success*, Addison-Wesley, Reading, MA.
- Kamauff, J.W. and Smith, D.B. (2004), "Extended enterprise metrics: the key to achieving synthesized effectiveness", *Journal of Business and Economics Research*, Vol. 2 No. 5, pp. 39-52.
- Kamble, S.S., Raut, R.D. and Bhasin, H. (2012), "Analysing the effect of uncertain environmental factors on supplier-buyer strategic partnership (SBSP) by using structural equation model (SEM)", *International Journal of Procurement Management*, Vol. 5 No. 2, pp. 202-228.
- Kashyap, A. (2011), "Impact of ERP implementation on supply chain management", *International Journal of Computer Applications in Engineering Sciences*, Vol. 1 No. 4, pp. 474-479.
- Ketchen, D.J. Jr and Hult, G.T.M. (2007), "Bridging organization theory and supply chain management: the case of best value supply chains", *Journal of Operations Management*, Vol. 25, pp. 573-580.
- Kiefer, A.W. and Novack, R.A. (1999), "An empirical analysis of warehouse measurement systems in the context of supply chain implementation", *Transportation Journal*, Vol. 38 No. 3, pp. 18-27.
- Kim, D.Y., Kumar, V. and Uma Kumar, U. (2012), "Relationship between quality management practices and innovation", *Journal of Operations Management*, Vol. 30 No. 4, pp. 295-315.
- Koh, S., Demirbag, M., Bayraktar, E., Tatoglu, E. and Zaim, S. (2007), "The impact of supply chain management practices on performance of SMEs", *Industrial Management and Data Systems*, Vol. 107 No. 1, pp. 103-124.
- Kotabe, M., Martin, X. and Domoto, H. (2003), "Gaining from vertical partnerships: knowledge transfer, relationship duration, and supplier performance improvement in the US and Japanese automotive industries", *Strategic Management Journal*, Vol. 24 No. 4, pp. 293-316.
- Koufteros, X.A., Vonderembse, M.A. and Doll, W.J. (1998), "Developing measures of time based manufacturing", *Journal of Operations Management*, Vol. 16 No. 1, pp. 21-41.
- Krause, D.R., Scannell, T.V. and Calantone, R.J. (2000), "A structural analysis of the effectiveness of buying firm's strategies to improve supplier performance", *Decisions Sciences*, Vol. 31, pp. 33-55.
- Lahiri, S. and Kedia, B.L. (2009), "The effects of internal resources and partnership quality on firm performance: an examination of Indian BPO providers", *Journal of International Management*, Vol. 15 No. 2, pp. 209-224.
- Lalonde, B.J. (1998), "Building a supply chain relationship", *Supply Chain Management Review*, Vol. 2 No. 2, pp. 7-8.
- Lambert, D.M. and Cooper, M.C. (2000), "Issues in supply chain management", *Industrial Marketing Management*, Vol. 29 No. 1, pp. 65-83.
- Lambert, D.M. and Pohlen, T.L. (2001), "Supply chain metrics", *International Journal of Logistics Management*, Vol. 12 No. 1, pp. 1-19.
- Lamming, R.C. (1996), "Squaring lean supply with supply chain management", *International Journal of Operations and Production Management*, Vol. 16 No. 2, pp. 183-196.
- Larson, P.D. and Kulchitsky, J.D. (2008), "The promise of information sharing and the peril of information overload", *International Journal of Logistics Systems and Management*, Vol. 4 No. 4, pp. 423-436.
- Lee, D. (2012), "From Apple to polka dots, technology can help supply chains react", BBC News, available at: www.bbc.co.uk/news/business-20668700?print=true (accessed December 10, 2012).
- Lee, H.L. and Billington, C. (1992), "Managing supply chain inventory: pitfalls and opportunities", *Sloan Management Review*, Vol. 33 No. 3, pp. 65-73.
- Lee, H.L. and Whang, S. (2001), "Winning the last mile of e-commerce", *Sloan Management Review*, Vol. 42 No. 4, pp. 54-62.
- Lee, H.L., Padmanabhan, V. and Whang, S. (1997), "The bullwhip effect in supply chains", *Sloan Management Review*, Vol. 38 No. 3, pp. 93-102.

- Lee, J. and Kim, Y. (1999), "Effect of partnership quality on IS outsourcing: conceptual framework and empirical validation", *Journal of Management Information Systems*, Vol. 15 No. 4, pp. 26-61.
- Lee, J.N. (2001), "The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success", *Information and Management*, Vol. 38, pp. 323-335.
- Lemke, F., Goffin, K. and Szwejcjewski, M. (2003), "Investigating the meaning of supplier-manufacturer partnerships: an exploratory study", *International Journal of Physical Distribution and Logistics Management*, Vol. 33 No. 1, pp. 12-35.
- Li, D. and O'Brien, C. (1999), "Integrated decision modelling of supply chain efficiency", *International Journal of Production Economics*, Vol. 20 Nos 1/3, pp. 147-157.
- Li, S. and Lin, B. (2006), "Assessing information sharing and information quality in supply chain management", *Decision Support Systems*, Vol. 42 No. 3, pp. 1641-1656.
- Li, S., Subba Rao, S., Ragu-Nathan, T.S. and Ragu-Nathan, B. (2005), "Development and validation of a management instrument for studying supply chain management practices", *Journal of Operations Management*, Vol. 23 No. 6, pp. 618-641.
- Li, X., Sawhney, R., Arendt, E.J. and Ramasamy, K. (2012), "A comparative analysis of management accounting systems' impact on lean implementation", *International Journal of Technology Management*, Vol. 57 No. 1, pp. 33-48.
- Lummus, R.R., Vokurka, R.J. and Duclos, L.K. (2005), "Delphi study on supply chain flexibility", *International Journal of Production Research*, Vol. 43 No. 13, pp. 2687-2708.
- Lyons, A., Coleman, J., Kehoe, D. and Coronado, A. (2004), "Performance observation and analysis of an information re-engineered supply chain: a case study of an automotive firm", *Industrial Management and Data Systems*, Vol. 104 No. 8, pp. 658-666.
- McAdam, R. and McCormack, D. (2001), "Integrating business processes for global alignment and supply chain management", *Business Process Management Journal*, Vol. 7 No. 2, pp. 113-130.
- McIvor, R. (2001), "Lean supply: the design and cost reduction dimensions", *European Journal of Purchasing and Supply Management*, Vol. 7, pp. 227-242.
- Mabert, V.A. and Venkataramanan, M.A. (1998), "Special research focus on supply chain linkages: challenges for design and management in the 21st century", *Decision Sciences*, Vol. 29 No. 1, pp. 537-552.
- Magretta, J. (1998), "The power of virtual integration: an interview with Dell computers' Michael Dell", *Harvard Business Review*, Vol. 76 No. 2, pp. 72-84.
- Malhotra, M.K. and Mackelprang, A.W. (2012), "Are internal manufacturing and external supply chain flexibilities complementary capabilities?", *Journal of Operations Management*, Vol. 30 No. 3, pp. 180-200.
- Mandal, P. and El-Houbi, A. (2009), "Business practices and information strategy in performance improvement", *International Journal of Productivity and Quality Management*, Vol. 4 Nos 5/6, pp. 715-729.
- Marksberry, P. (2012), "Investigating 'The Way' for Toyota suppliers: a quantitative outlook on Toyota's replicating efforts for supplier development", *Benchmarking: An International Journal*, Vol. 19 No. 2, pp. 277-298.
- Mason-Jones, R. and Towill, D.R. (1997), "Information enrichment: designing the supply chain for competitive advantage", *Supply Chain Management*, Vol. 2 No. 4, pp. 137-148.
- Mathew, J. (2012), "Retail supply chain: challenges and prospects", *International Journal of Physical Distribution and Logistics Management*, Vol. 38 No. 4, pp. 296-310.
- Mentzer, J.T., Foggin, J.H. and Golicic, S.L. (2000), "Collaboration: the enablers, impediments and benefits", *Supply Chain Management Review*, Vol. 5 No. 4, pp. 52-58.
- Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. and Zacharia, Z.G. (2001), "Defining supply chain management", *Journal of Business Logistics*, Vol. 22 No. 2, pp. 1-25.

- Metters, R. (1997), "Quantifying the bullwhip effect in supply chains", *Journal of Operations Management*, Vol. 15 No. 1, pp. 89-100.
- Miguel, P.L.D.S. and Brito, L.A.L. (2013), "Supply chain management measurement and its influence on operational performance", *Journal of Operations and Supply Chain Management*, Vol. 4 No. 2, pp. 56-70.
- Min, S. and Mentzer, J.T. (2004), "Developing and measuring supply chain concepts", *Journal of Business Logistics*, Vol. 25 No. 1, pp. 63-99.
- Moberg, C.R., Cutler, B.D., Gross, A. and Speh, T.W. (2002), "Identifying antecedents of information exchange with in supply chain", *International Journal of Physical Distribution and Logistics Management*, Vol. 32 No. 9, pp. 755-770.
- Modi, S.B. and Mabert, V.M. (2007), "Supplier development: improving supplier performance through knowledge transfer", *Journal of Operations Management*, Vol. 25 No. 1, pp. 42-64.
- Molnár, A. and Gellynck, X. (2009), "Chain governance structures: the European traditional food sector", *British Food Journal*, Vol. 111 No. 8, pp. 762-775.
- Monczka, R.M. and Morgan, J. (1997), "What's wrong with supply chain management", *Purchasing*, Vol. 122 No. 1, pp. 69-72.
- Monczka, R.M., Morgan, J., Trent, R.J. and Handfield, B. (1998), *Purchasing and Supply Chain Management*, Thomas Rennie Cengage Learning, South-Western, Cincinnati, OH.
- Moon, K.K.L., Yi, C.Y. and Ngai, E.W.T. (2012), "An instrument for measuring supply chain flexibility for the textile and clothing companies", *European Journal of Operational Research*, Vol. 222 No. 2, pp. 191-203.
- Nahm, A.Y., Vonderembse, M.A. and Koufteros, X.A. (2003), "The impact of organizational structure on time-based manufacturing and plant performance", *Journal of Operations Management*, Vol. 21 No. 3, pp. 281-306.
- Narasimhan, R. and Das, A. (1999), "An empirical investigation of the contribution of strategic sourcing to manufacturing flexibilities and performance", *Decision Sciences*, Vol. 30 No. 3, pp. 683-718.
- Narasimhan, R. and Das, A. (2000), "An empirical examination of sourcing's role in developing manufacturing flexibilities", *International Journal of Production Research*, Vol. 38 No. 4, pp. 875-893.
- Narasimhan, R. and Jayaram, J. (1998), "Causal linkages in supply chain management: an exploratory study of North American manufacturing firms", *Decision Sciences*, Vol. 29 No. 3, pp. 579-605.
- Narayandas, D. and Rangan, K. (2004), "Building and sustaining buyer-seller relationships in mature industrial markets", *Journal of Marketing*, Vol. 68 No. 3, pp. 63-77.
- Naylor, J.B., Naim, M.M. and Berry, D. (1999), "Legality: integrating the lean and agile manufacturing paradigms in the total supply chain", *International Journal of Production Economics*, Vol. 62 No. 1, pp. 107-118.
- Neely, A., Gregory, M. and Platts, K. (1995), "Performance measurement system design: a literature review and research agenda", *International Journal of Operations and Production Management*, Vol. 15 No. 4, pp. 80-116.
- Neely, A., Mills, J., Platts, K., Gregory, M. and Richards, H. (1994), "Realizing strategy through measurement", *International Journal of Operations and Production Management*, Vol. 14 No. 3, pp. 140-152.
- Ngai, E.W.T., Lai, K.H. and Cheng, T.C.E. (2008), "Logistics information systems: the Hong Kong experience", *International Journal of Production Economics*, Vol. 113 No. 1, pp. 223-234.
- Noble, D. (1997), "Purchasing and supplier management as a future competitive edge", *Logistics Focus*, Vol. 5 No. 5, pp. 23-27.
- Noble, S., Shenkan, A.G. and Shi, C. (2009), *The Promise of Multichannel Retailing*, McKinsey, pp. 1-4.
- Novack, R.A., Langley, C.J. Jr and Rinehart, L.M. (1995), *Creating Logistics Value: Themes for the Future*, Council of Logistics Management, Oak Brook, IL.

- Nunnally, J.C. (1978), *Psychometric*, 2nd ed., McGraw-Hill, New York, NY.
- Ogunyemi, O. and Ibrahim, S.E. (2012), "The effect of linkages and information sharing on supply and export performance: an empirical study of Egyptian textile manufacturers", *Journal of Manufacturing Technology Management*, Vol. 23 No. 4, pp. 441-463.
- Oh, L.B., Teo, H.H. and Sambamurthy, V. (2012), "The effects of retail channel integration through the use of information technologies on firm performance", *Journal of Operations Management*, Vol. 30 No. 5, pp. 368-381.
- Oliva, R. and Watson, N.H. (2009), "Managing functional biases in organizational forecasts: a case study of consensus forecasting in supply chain planning", *Production and Operations Management*, Vol. 18 No. 2, pp. 138-151.
- Oliver, R.L. (1980), "A cognitive model of the antecedents and consequences of satisfaction decisions", *Journal of Marketing Research*, Vol. 17 No. 4, pp. 460-469.
- Parmigiani, A., Klassen, R.D. and Russo, M.V. (2011), "Efficiency meets accountability: performance implications of supply chain configuration, control, and capabilities", *Journal of Operations Management*, Vol. 29 No. 3, pp. 212-223.
- Patel, P.C. and Jayaram, J. (2013), "The antecedents and consequences of product variety in new ventures: an empirical study", *Journal of Operations Management*, Vol. 32 Nos 1-2, pp. 34-50.
- Paulraj, A., Lado, A. and Chen, J. (2008), "Inter-organizational communication as a relational competency: antecedents and performance outcomes in collaborative buyer-supplier relationships", *Journal of Operations Management*, Vol. 26 No. 1, pp. 45-64.
- Pereira, J.V. (2009), "The new supply chain's frontier: information management", *International Journal of Information Management*, Vol. 29 No. 5, pp. 372-379.
- Popli, G.S. and Kumari, S. (2013), "Impact of multi brand foreign direct investment in retail sector in India", *International Journal of Research in Commerce and Management*, Vol. 4 No. 11, pp. 1-16.
- Prahinski, C. and Benton, W.C. (2013), "Supplier evaluations: communication strategies to improve supplier performance", *Journal of Operations Management*, Vol. 22 No. 1, pp. 39-62.
- Prajogo, D. and Olhager, J. (2011), "Supply chain integration and performance: the effects of long-term relationships, information technology and sharing, and logistics integration", *International Journal Production Economics*, Vol. 136, pp. 123-130.
- Radas, S. and Božić, L. (2009), "The antecedents of SME innovativeness in an emerging transition economy", *Technovation*, Vol. 29 Nos 6/7, pp. 438-450.
- Rai, A., Patnayakuni, R. and Seth, N. (2006), "Firm performance impacts of digitally enabled supply chain integration capabilities", *MIS Quarterly*, Vol. 30 No. 2, pp. 225-246.
- Raisinghani, M.S. and Meade, L.L. (2005), "Strategic decisions in supply-chain intelligence using knowledge management: an analytic-network-process framework", *Supply Chain Management: An International Journal*, Vol. 10 No. 2, pp. 114-121.
- Raman, R., Chadee, D., Roxas, B. and Michailova, S. (2013), "Effects of partnership quality, talent management, and global mindset on performance of offshore IT service providers in India", *Journal of International Management*, Vol. 19 No. 4, pp. 333-346.
- Ranjan, J. and Bhatnagar, V. (2010), "A framework for analytical CRM: a data mining perspective", *International Journal of Business Excellence*, Vol. 3 No. 1, pp. 1-18.
- Reichhart, A. and Holweg, M. (2007), "Lean distribution: concepts, contributions, conflicts", *International Journal of Production Research*, Vol. 45 No. 16, pp. 3699-3722.
- Rexhausen, D., Pibernik, R. and Kaiser, G. (2012), "Customer-facing supply chain practices – the impact of demand and distribution management on supply chain success", *Journal of Operations Management*, Vol. 30 No. 4, pp. 269-281.
- Ro, Y.K., Liker, J.K. and Fixson, S.K. (2008), "Evolving models of supplier involvement in design: the deterioration of the Japanese model in US auto", *IEEE Transactions on Engineering Management*, Vol. 55 No. 2, pp. 359-377.

- Ryu, S., Park, J.E. and Min, S. (2007), "Factors of determining long-term orientation in interfirm relationships", *Journal of Business Research*, Vol. 60 No. 12, pp. 1225-1233.
- Salhieh, L. (2011), "An exploratory study of the relationship between supply chain management practices and technical efficiency of Jordanian manufacturing companies", *International Journal of Business and Management*, Vol. 6 No. 12, pp. 126-134.
- Sahay, B.S., Gupta, J.N.D. and Mohan, R. (2006), "Managing supply chains for competitiveness: the Indian scenario", *Supply Chain Management: An International Journal*, Vol. 11 No. 1, pp. 15-24.
- Scannell, T.N., Vickery, S.K. and Droge, C.L. (2000), "Upstream supply chain management and competitive performance in the automotive supply industry", *Journal of Business Logistics*, Vol. 21 No. 1, pp. 23-48.
- Schermelleh-Engel, K. and Moosbrugger, H. (2003), "Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measures", *Methods of Psychological Research*, Vol. 8 No. 2, pp. 23-74.
- Scott, C. and Westbrook, R. (1991), "New strategic tools for supply chain management", *International Journal of Physical Distribution and Logistics Management*, Vol. 21 No. 1, pp. 177-187.
- Sheridan, J.H. (1998), "The supply-chain paradox", *Industry Week*, Vol. 247 No. 3, pp. 20-29.
- Sheu, C., Yen, H.R. and Chae, B. (2006), "Determinants of supplier-retailer collaboration: evidence from an international study", *International Journal of Operations and Production Management*, Vol. 26 No. 1, pp. 24-49.
- Shin, H., Collier, D.A. and Wilson, D.D. (2000), "Supply management orientation and supplier/buyer performance", *Journal of Operations Management*, Vol. 18 No. 3, pp. 317-333.
- Simchi-Levi, D., Kaminsky, P. and Simichi-Levi, E. (2003), "Designing and managing the supply chain-concepts", in Simchi-Levi, D. (Ed.), *Strategies and Case Studies*, McGraw-Hill Publishing, New York, NY, pp. 259-261.
- Singh, R.K., Garg, S.K. and Deshmukh, S.G. (2010), "Strategy development by Indian SSIs", *Industrial Management and Data Systems*, Vol. 110 No. 7, pp. 1073-1093.
- Spekman, R.E., Kamauff, J.W. Jr and Myrh, N. (1998), "An empirical investigation into supply chain management: a perspective on partnerships", *International Journal of Physical Distribution and Logistics Management*, Vol. 28 No. 8, pp. 630-650.
- Srinivasan, M., Mukherjee, D. and Gaur, A.S. (2011), "Buyer-supplier partnership quality and supply chain performance: moderating role of risks, and environmental uncertainty", *European Management Journal*, Vol. 29 No. 4, pp. 260-271.
- Stein, T. and Sweat, J. (1998), "Killer supply chains", *Information Week*, Vol. 708 No. 9, pp. 36-46.
- Stevens, G.C. (1989), "Integrating the supply chain", *International Journal of Physical Distribution and Logistics Management*, Vol. 19 No. 8, pp. 3-8.
- Stevens, G.C. (1990), "Successful supply-chain management", *Management Decision*, Vol. 28 No. 8, pp. 25-28.
- Stevenson, M. and Spring, M. (2007), "Flexibility from a supply chain perspective: definition and review", *International Journal of Operations & Production Management*, Vol. 27 No. 7, pp. 685-713.
- Stock, G.N., Greis, N.P. and Kasarda, J.D. (1998), "Logistics, strategy and structure", *International Journal of Operations and Production Management*, Vol. 18 No. 1, pp. 37-52.
- Stouthuysen, K., Slabbinck, H. and Roodhooft, F. (2012), "Controls, service type and perceived supplier performance in interfirm service exchanges", *Journal of Operations Management*, Vol. 30 No. 5, pp. 423-435.
- Stuart, F.I. and McCutcheon, D.M. (1996), "Sustaining strategic supplier alliances: profiling the dynamic requirements for continued development", *International Journal of Production and Operations Management*, Vol. 16 No. 10, pp. 5-22.
- Suarez, F.F., Cusumano, M.A. and Fine, C.H. (1996), "An empirical study of flexibility in printed circuit board assembly", *Operations Research*, Vol. 44 No. 1, pp. 223-240.

- Sukatia, I., Hamida, A.B., Baharuna, R. and Yusoffa, R. (2012), "The study of supply chain management strategy and practices on supply chain performance", *Procedia – Social and Behavioral Sciences*, Vol. 40 No. 1, pp. 225-233.
- Sundram, V.P.K., Ibrahim, A.R. and Govindaraju, C.V.G.R. (2011), "Supply chain management practices in the electronics industry in Malaysia: consequences for supply chain performance", *Benchmarking: An International Journal*, Vol. 18 No. 6, pp. 834-855.
- Talluri, S. and Narasimhan, R. (2004), "A methodology for strategic sourcing", *European Journal of Operational Research*, Vol. 154 No. 1, pp. 236-250.
- Tan, K.C., Kannan, V.R. and Handfield, R.B. (1998), "Supply chain management: supplier performance and firm performance", *International Journal of Purchasing and Materials Management*, Vol. 34 No. 3, pp. 2-9.
- Tan, K.C., Kannan, V.R. and Handfield, R.B. (1999), "Supply chain management: an empirical study of its impact on performance", *International Journal of Operations and Production Management*, Vol. 19 No. 10, pp. 1034-1052.
- Tan, K.C., Lyman, S.B. and Wisner, J.D. (2002), "Supply chain management: a strategic perspective", *International Journal of Operations and Production Management*, Vol. 22 No. 6, pp. 614-631.
- Taticchi, P. and Balachandran, K.R. (2008), "Forward performance measurement and management integrated frameworks", *International Journal of Accounting and Information Management*, Vol. 16 No. 2, pp. 140-154.
- Taylor, D.H. (1999), "Supply chain improvement: the lean approach", *Logistics Focus*, Vol. 7 No. 1, pp. 14-20.
- Thatte, A.A. (2007), "Competitive advantage of a firm through supply chain responsiveness and SCM practices", doctoral dissertation, University of Toledo, Toledo, OH.
- Towill, D.R. (1997), "The seamless supply chain – the predator's strategic advantage", *International Journal of Technology Management*, Vol. 13 No. 1, pp. 37-56.
- Trkman, P., McCormack, K., de Oliveira, M.P.V. and Ladeira, M.B. (2010), "The impact of business analytics on supply chain performance", *Decision Support Systems*, Vol. 49 No. 3, pp. 318-327.
- Tung, J. (2012), "A study of product innovation on firm performance", *The International Journal of Organizational Innovation*, Vol. 4 No. 3, pp. 84-97.
- Turner, J.R. (1993), "Integrated supply chain management: what's wrong with this picture", *Industrial Engineering*, Vol. 25 No. 12, pp. 52-55.
- Twede, D., Clarke, R.H. and Tait, J.A. (2000), "Packaging postponement: a global packaging strategy", *Packaging Technology Science*, Vol. 13 No. 3, pp. 105-115.
- van der Vaart, T. and van Donk, D.P. (2008), "A critical review of survey-based research in supply chain integration", *International Journal of Production Economics*, Vol. 111 No. 1, pp. 42-55.
- Van Der Vorst, J.G.A.J. (2006), "Performance measurement in agri-food supply-chain networks", in Ondersteijn, C.J.M., Wijnands, J.H.M., Huirne, R.B.M. and Van Kooten, O. (Eds). *Logistics and Operations Research Group*, Wageningen University, pp. 14-24.
- Van Hoek, R.I. (1998), "Measuring the unmeasurable, measuring and improving performance in the supply chain", *Supply Chain Management, An International Journal*, Vol. 3 No. 4, pp. 187-192.
- Van Hoek, R.I. and van Dierdonck, R. (1997), "Postponed manufacturing as a supplementary service", *EUROMA Conference Proceedings on Managing Service Operations, Lessons from the Service and the Manufacturing Operations, Barcelona, June*.
- Venkatraman, N. and Ramanujan, V. (1987), "Measurement of business economic performance: an examination of method convergence", *Journal of Management*, Vol. 13 No. 1, pp. 109-122.
- Vickery, S., Calantone, R. and Droge, C. (1999), "Supply chain flexibility: an empirical study", *The Journal of Supply Chain Management*, Vol. 35 No. 1, pp. 16-24.
- Vickery, S.K., Jayaram, J., Droge, C. and Calantone, R. (2003), "The effects of an integrative supply chain strategy on customer service and financial performance: an analysis of direct versus indirect relationships", *Journal of Operations Management*, Vol. 21 No. 5, pp. 523-539.

- Wallace, D.W., Giese, J.L. and Johnson, J.L. (2004), "Customer retailer loyalty in the context of multiple channel strategies", *Journal of Retailing*, Vol. 80 No. 4, pp. 249-263.
- Waller, M.A., Dabholkar, P.A. and Gentry, J.J. (2000), "Postponement, product customization, and market-oriented supply chain management", *Journal of Business Logistics*, Vol. 21 No. 2, pp. 133-160.
- White, A., Daniel, E.M. and Mohdzain, M. (2005), "The role of emergent information technologies and systems in enabling supply chain agility", *International Journal of Information Management*, Vol. 25 No. 5, pp. 396-410.
- Wilson, D.T. and Vlosky, R.P. (1998), "Inter-organizational information system technology and buyer-seller relationships", *Journal of Business and Industrial Marketing*, Vol. 13 No. 3, pp. 215-234.
- Wines, L. (1996), "High order strategy for manufacturing", *The Journal of Business Strategy*, Vol. 17 No. 4, pp. 32-33.
- Wisner, J.D. (2003), "A structural equation model of supply chain management strategies and firm performance", *Journal of Business Logistics*, Vol. 24 No. 1, pp. 1-27.
- Womack, J.P. and Jones, D.T. (1996), *Lean Thinking*, Simon and Schuster, New York, NY.
- Wong, W.P. and Wong, K.Y. (2008), "A review on benchmarking of supply chain performance measures", *Benchmarking: An International Journal*, Vol. 15 No. 1, pp. 25-51.
- Wood, A. (1997), "Extending the supply chain: strengthening links with IT", *Chemical Week*, Vol. 159 No. 25, pp. 25-26.
- Wu, F., Yenyiyurt, S., Kim, D. and Cavusgil, S.R.T. (2006), "The impact of information technology on supply chain capabilities and firm performance: a resource-based view", *Industrial Marketing Management*, Vol. 35 No. 4, pp. 493-504.
- Xue, L., Ray, G. and Sambamurthy, V. (2013), "The impact of supply-side electronic integration on customer service performance", *Journal of Operations Management*, Vol. 31 No. 6, pp. 363-375.
- Yang, B. and Burn, N. (2003), "Implications of postponement for the supply chain", *International Journal of Production Research*, Vol. 41 No. 9, pp. 2075-2090.
- Yang, B., Yang, Y. and Wijngaard, J. (2007), "Postponement: an inter-organizational perspective", *International Journal of Production Research*, Vol. 45 No. 4, pp. 971-988.
- Yeung, J.H.Y., Selen, W., Deming, Z. and Min, Z. (2007), "Postponement strategy from a supply chain perspective: cases from China", *International Journal of Physical Distribution and Logistics Management*, Vol. 37 No. 4, pp. 331-356.
- Youn, S.G., Yang Hong, M., Hong, P. and Park, K. (2011), "Strategic supply chain partnership, environmental supply chain management practices, and performance outcomes: an empirical study", *Journal of Cleaner Production*, pp. 1-10.
- Zaheer, A. and Venkatraman, N. (1995), "Relational governance as an Interorganizational strategy: an empirical test of the role of trust in economic exchange", *Strategic Management Journal*, Vol. 16 No. 5, pp. 373-392.
- Zhao, X., Xie, J. and Zhang, W.J. (2002), "The impact of information sharing and ordering co-ordination on supply chain performance", *Supply Chain Management: An International Journal*, Vol. 7 No. 1, pp. 24-40.
- Zinn, W. and Bowersox, D.J. (1988), "Planning physical distribution with the principle of postponement", *Journal of Business Logistics*, Vol. 9 No. 2, pp. 117-136.
- Zografos, K.G. and Giannouli, I.M. (2001), "Development and application of a methodological framework for assessing SCM trends", *International Journal of Logistics: Research and Applications*, Vol. 4 No. 2, pp. 153-190.

Further reading

- Ahn, T., Ryu, S. and Han, I. (2007), "The impact of web quality and playfulness on user acceptance of online retailing", *Information and Management*, Vol. 44 No. 3, pp. 263-275.

- Ansari, A. (1986), "Strategies for the implementation of JIT purchasing", *International Journal of Physical Distribution and Logistics Management*, Vol. 17 No. 1, pp. 5-12.
- Berry, T. and Ahmed, A. (1997), "The consequences of interfirm supply chains for management accounting", *Management Accounting*, Vol. 75 No. 10, pp. 74-75.
- Braganza, A. (2002), "Enterprise integration: creating competitive capabilities", *Integrated Manufacturing Systems*, Vol. 13 No. 8, pp. 562-572.
- Cagliano, R., Caniato, F. and Spina, G. (2006), "The linkage between supply chain integration and manufacturing improvement programmes", *International Journal of Operations & Production Management*, Vol. 26 No. 3, pp. 282-299.
- Chong, A.Y.L. and Ooi, K.B. (2008), "Adoption of inter organizational system standards in supply chains", *Industrial Management and Data Systems*, Vol. 108 No. 4, pp. 529-547.
- Chong, A.Y.L., Ooi, K.B., Lin, B. and Raman, M. (2009), "Factors affecting the adoption level of C-commerce: an empirical study", *Journal of Computer Information Systems*, Vol. 50 No. 2, pp. 13-22.
- Fisher, A.G. (1999), *Assessment of Motor and Process Skills*, 3rd ed., Three Star Press, Fort Collins, CO.
- Freeland, J.R. (1991), "A survey of just-in-time purchasing practices in the United States", *Production and Inventory Management Journal*, Vol. 32 No. 2, pp. 43-49.
- Giunipero, L.C., Hooker, R.E., Joseph-Matthews, S., Yoon, T.E. and Brudvig, S. (2008), "A decade of SCM literature: past, present and future implications", *Journal of Supply Chain Management*, Vol. 44 No. 4, pp. 66-86.
- Hamister, J.W. (2012), "Supply chain management practices in small retailers", *International Journal of Retail and Distribution Management*, Vol. 40 No. 6, pp. 427-450.
- Hendricks, K.B., Singhal, V.R. and Stratman, J.K. (2007), "The impact of enterprise systems on corporate performance: a study of ERP, SCM, and CRM system implementations", *Journal of Operations Management*, Vol. 25 No. 1, pp. 65-82.
- Kaynak, H. and Hartley, J.L. (2006), "Using replication research for just-in-time purchasing construct development", *Journal of Operations Management*, Vol. 24 No. 6, pp. 868-892.
- Krause, D.R., Handfield, R.B. and Tyler, B.B. (2007), "The relationships between supplier development, commitment, social capital accumulation and performance improvement", *Journal of Operations Management*, Vol. 25 No. 2, pp. 528-545.
- Lamming, R., Caldwell, N. and Harrison, D. (2013), "Developing the concept of transparency for use in supply relationships", *British Journal of Management*, Vol. 15 No. 4, pp. 291-302.
- Narasimhan, R. and Das, A. (2007), "An empirical investigation of the contribution of strategic sourcing to manufacturing flexibilities and performance", *Decision Sciences*, Vol. 30 No. 3, pp. 683-718.
- Pagell, M. (2004), "Understanding the factors that enable and inhibit the integration of operations, purchasing and logistics", *Journal of Operations Management*, Vol. 22 No. 5, pp. 459-487.
- Hallgren, M. and Olhager, J. (2009), "Lean and agile manufacturing: external and internal drivers and performance outcomes", *International Journal of Operations and Production Management, Production Management*, Vol. 29 No. 10, pp. 976-999.
- Schonberger, R. and Gilbert, J. (1983), "Just-in-time purchasing: a challenge for US industry", *California Management Review*, Vol. 26 No. 1, pp. 54-68.

(The Appendix follows overleaf.)

PERSCF1	Our supply chain is able to handle difficult nonstandard orders including numerous features options, sizes, and colors
PERSCF2	Our supply chain is able to rapidly adjust capacity so as to accelerate or decelerate production in response to changes in customer demand
PERSCF3	Our supply chain is able to rapidly introduce large numbers of product improvements/variation
PERSCF4	Our supply chain is able to handle rapid introduction of new products
PERSCF5	Our supply chain is able to respond to the needs and wants of the firm's target market(s)
<i>PERSCI</i>	
<i>Supply chain integration</i>	
PERSCI1	There is a high level of communication and coordination between all functions in our firm
PERSCI2	Cross-functional teams are frequently used for process design and improvement in our firm
PERSCI3	There is a high level of integration of information systems in our firm
PERSCI4	There is a great amount of cross-over of the activities of our firm and our suppliers
PERSCI5	Our supply chain is characterized by full system visibility from suppliers' suppliers to customers' customers
<i>PERRTC</i>	
<i>Responsiveness to customers</i>	
PERRTC1	Our firm fills customer orders on time
PERRTC2	Our firm has short order-to-delivery cycle time
PERRTC3	Our firm has fast customer response time
<i>PERRM</i>	
<i>Relationship measures</i>	
PERRMSP	Supplier performance
PERRMSP1	Our suppliers deliver material/components/products to us on time
PERRMSP2	Our suppliers provide dependable delivery to us
PERRMSP3	Our suppliers provide materials/components/products that are highly reliable
PERRMSP4	Our suppliers provide high-quality materials/component/products to us
PERRMSP5	Our suppliers provide materials/component/products to us at low cost
PERRMSP6	Our supplier base has reduced over the past three years
PERRMPQ	Partnership quality
PERRMPQ1	We do not wish to terminate current partnerships with suppliers and establish new ones
PERRMPQ2	We believe our relationship with our suppliers is mutually profitable
PERRMPQ3	We and our suppliers share any risk that can occur in the supply chain
PERRMPQ4	We and our suppliers share benefits obtained from SCM
PERRMPQ5	Our relationship with suppliers is marked by a high degree of harmony
PERRMPQ6	Our overall relationship with suppliers is satisfactory
PERRMPQ7	Our suppliers have been open and honest in dealing with us
PERRMPQ8	Our suppliers are reliable
PERRMPQ9	Our suppliers respect the confidentiality of the information they receive from us
PERRMPQ10	Our transactions with suppliers do not have to be closely supervised
PERRMPQ11	Our suppliers have made sacrifices for us in the past
PERRMPQ12	Our suppliers are willing to provide assistance to us without exception
PERRMPQ13	We expect to increase business with our suppliers in the future
PERRMPQ14	We have invested a lot of effort in our relationship with suppliers
PERRMPQ15	Our suppliers abide by agreements very well
PERRMPQ16	We and our suppliers always try to keep each other's promises
PERRMPQ17	We and our suppliers understand each other's' business policies and rules very well
PERRMPQ18	We and our suppliers have a similar understanding about the aims and objectives of the supply chain
PERRMPQ19	We and our suppliers have a similar understanding about the importance of collaboration across the supply chain

Table AI.
Instruments for SCM
performance

(continued)

PERRMPQ20	We and our suppliers have a similar understanding about the importance of improvements that benefit the supply chain as a whole
<i>PERTM</i>	<i>Traditional measures</i>
PERTME	Efficiency
PERTME1	Our store has more items per sale
PERTME2	Our store has higher value of business per each transaction
PERTME3	Our store have more point of sales (POS) per square meter than others
PERTME4	Our store has more full time employees per square foot of area of store.
PERTME5	Our operating expenses per square foot area are less than others
PERTMQ	Quality
PERTMQ1	We are able to compete based on quality
PERTMQ2	We offer products that are highly reliable
PERTMQ3	We offer products that are highly durable
PERTMQ4	We offer high-quality products to our customers
PERTMPI	Product innovation
PERTMPI1	We provide customized products
PERTMPI2	We alter our product offerings to meet client needs
PERTMMP	Market performance
PERTMMP1	Market share
PERTMMP2	The growth of market share
PERTMMP3	The growth of sales

SCMPCRP	Customer relations practices
SCMPCRP1	We frequently evaluate the formal and informal complaints of our customers
SCMPCRP2	We frequently interact with customers to set reliability, responsiveness, and other standards for us
SCMPCRP3	We have frequent follow-up with our customers for quality/service feedback
SCMPCRP4	We frequently measure and evaluate customer satisfaction
SCMPCRP5	We frequently determine future expectations
SCMPCRP6	We facilitate customers' ability to seek assistance from us
SCMPCRP7	We share a sense of fair play with our customer
SCMPCRP8	We periodically evaluate the importance of our relationship with our customers
<i>SCMPSSP Strategic supplier partnership</i>	
SCMPSSP1	We rely on a few dependable suppliers
SCMPSSP2	We rely on a few high-quality suppliers
SCMPSSP3	We consider quality as our number one criterion in selecting suppliers
SCMPSSP4	We strive to establish a long-term relationship with our suppliers
SCMPSSP5	We regularly solve problems jointly with our suppliers
SCMPSSP6	We have helped our suppliers to improve their product quality
SCMPSSP7	We have continuous improvement programs that include our key suppliers
SCMPSSP8	We include our key suppliers in our planning and goal-setting activities
SCMPSSP9	We actively involve our key suppliers in new product development processes
SCMPSSP10	We certify our suppliers for quality
<i>SCMPIS Information sharing</i>	
SCMPIS1	We share our business units' proprietary information with suppliers
SCMPIS2	We inform suppliers in advance of changing needs
SCMPIS3	Our suppliers share proprietary information with us
SCMPIS4	Our suppliers keep us fully informed about issues that affect our business
SCMPIS5	Our suppliers share business knowledge of core business processes with us
SCMPIS6	We and our suppliers exchange information that helps establishment of business planning
SCMPIS7	We and our suppliers keep each other informed about events or changes that may affect the other partners
<i>SCMPIQ Information quality</i>	
SCMPIQ1	Information exchange between our suppliers and us is timely
SCMPIQ2	Information exchange between our suppliers and us is accurate
SCMPIQ3	Information exchange between our trading part suppliers and us is complete
SCMPIQ4	Information exchange between our suppliers and us is adequate
SCMPIQ5	Information exchange between our suppliers and us is reliable
<i>SCMPLRP Lean retailing practices</i>	
SCMPLRP1	Our firm reduces set-up time
SCMPLRP2	Our firm has continuous quality improvement program
SCMPLRP3	Our firm pushes suppliers for shorter lead times
SCMPLRP4	Our firm streamlines ordering, receiving, and other paperwork from suppliers
SCMPLRP5	Suppliers' warehouses/factories are located nearby
SCMPLRP6	We order in small lot sizes from our supplier
SCMPLRP7	Inspection of incoming materials/components/products has been reduced
SCMPLRP8	Inspection of outbound materials has been reduced
SCMPLRP9	We involve our customers in process/product design

Table AII.
Instruments for SCM
performance

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