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Supply chain strategy and the role of suppliers: evidence from the Indian sub-continent

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Abstract

Purpose – Supply chain strategy is widely recognized as being a crucial component of a broader corporate strategy. However, the relationships between a firm's strategic supply chain focus, the tactical orientation of its suppliers, and the firm's performance, are less well understood. Much of what is known is also based on developed country contexts. The purpose of this paper is to empirically examine relationships between a buying firm's supply chain strategy and operational dimensions of its suppliers in a developing country context.

Design/methodology/approach – A structural equation model is developed and tested using empirical data drawn from 296 organizations in India and Pakistan.

Findings – The results demonstrate a positive relationship between a firm's strategic supply chain focus (lean and responsiveness) and key supplier practices (quality, cost effectiveness, delivery, and flexibility), which in turn have a positive impact on firm performance (operational, quality and market, and financial).

Practical implications – The study paper offers supply chain managers in developing markets with insights that can shape effective supplier selection and management and lead to positive performance outcomes.

Originality/value – The results provide insights into supply chain strategy, and empirically validate the importance of the alignment between strategy and the ability of suppliers to execute in a corresponding manner. It also offers evidence of the impact of the buyer-supplier interface in a developing market context.

Keywords Performance, Firm performance, Structural equation modeling, Empirical research, Supply chain management, Supplier management

Paper type Research paper

Introduction

Organizations are increasingly recognizing that an effective supply chain strategy can be a driver of long-term competitive advantage. Moreover, they are viewing supply chain strategy as an important element of overall business strategy (Qi *et al.*, 2009), and as a means to responding in a timely manner to changing competitive conditions. Fisher (1997) made the distinction between physically efficient and market responsive supply chain strategies. Physically efficient supply chains are those in which the primary objective is to minimize the physical costs associated with the production and

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delivery of goods with relatively predictable demand patterns (Qi *et al.*, 2011). In contrast, market responsive supply chains seek to minimize the market mediation costs associated with imbalances between supply and demand for products with highly unpredictable demand (Roh *et al.*, 2014). More recently, Fisher's characterization has been recast in terms of lean supply chains that emphasize waste reduction, and agile supply chains that emphasize responsiveness to changing market conditions (Qi *et al.*, 2009).

The principles of a lean supply chain strategy are derived from lean management (Qi *et al.*, 2009) which emphasizes the reduction and elimination of waste and non-value-added activity. In contrast, agility implies responding to changing demand in a timely manner (Tan *et al.*, 2002). While a firm may tend to emphasize one of these strategic orientations, their strategy should embrace both so that the firm can compete on multiple dimensions of performance (Lo and Power, 2010; Ketchen *et al.*, 2008). Regardless of the orientation however, the effective execution of corresponding supply chain practices can enable a firm's supply chain strategy to yield competitive advantage in areas such as quality, cost, innovation, delivery reliability, and time to market (Li *et al.*, 2006; Jajja *et al.*, 2014a).

An important factor in the successful execution of supply chain strategy is its alignment with supplier tactics (Cox *et al.*, 2004; Kannan and Tan, 2003; Schmitz and Platts, 2003). To the extent that a supplier acts as an extension of the buyer, the supplier's ability to execute in a manner that is consistent with the buyer's strategic objectives is a key determinant of the buying firm's performance. Chen (2011) argued that a buyer's strategic priorities provide the backdrop for developing appropriate supplier selection and evaluation processes. Strategic sourcing that reflects a firm's relationships with its suppliers positively influences the firm's ability to achieve objectives relative to agility (Chiang *et al.*, 2012). Buying firms can also acquire flexibility by appropriately selecting and configuring their supply networks to emphasize sourcing and vendor flexibility (Gosling *et al.*, 2010; Luo *et al.*, 2009). Similarly, firms that seek to develop lean supply chains should select and evaluate suppliers accordingly (Aksoy and Öztürk, 2011).

Despite the significant body of research on supply chain management, there is little research that explicitly examines the relationship between a buyer's supply chain strategy and its suppliers' tactics, and the performance implications for the buyer (Arlbjørn and Paulraj, 2013). Supplier selection and buyer-supplier engagement influence buyer performance (e.g. Kannan and Tan, 2006). How effectively a supplier can serve a buyer is, however, predicated on the buyer having a clear strategic focus with respect to its suppliers, and suppliers being equipped to perform accordingly (Koufteros *et al.*, 2012). The link between a firm's strategic supply chain focus and the actions of its suppliers is thus an important one.

The current study addresses a research gap by investigating relationships between the supply chain strategies of buying firms, key drivers of supplier performance, and measures of buyer performance. These relationships are embedded in a structural equation model that is tested using survey data from firms in India and Pakistan. Despite the growth of emerging markets as hubs for manufacturing activity, much of the supply chain management literature continues to focus on developed world contexts. The rising number of manufacturing companies and the expansion of supply chains in the Indian sub-continent in particular, provide significant opportunity for research (Osama *et al.*, 2012). However, as noted by Avittathur and Swamidass (2007), "While the supply chain practices in the U.S. have been the focus of intense research for nearly 15 years, the supply chain practices in China, India, and other developing

countries have received very little attention." India and Pakistan are the two largest economies within the South Asian Association for Regional Cooperation, and two of the largest countries by population (World Bank, 2015). They share a number of economic factors (Conover, 2011; IMF, 2012), and belong to the group of 11 secondary emerging markets (FTSE, 2015).

Recognition that firms in the Indian sub-continent need to align business strategies, supply chain strategies, and tactics to achieve competiveness in a global context is increasing (Sahay and Mohan, 2003). Saad and Patel (2006) highlighted how factors including cost and quality were motivating the implementation of supply chain practices by companies in the Indian automotive sector. They also discussed the challenges that companies faced in raising supply chain performance. These included supplier capacity and a lack of professional purchasing practices. Two additional studies also speak to supply chain management in the Indian automotive sector. Joshi *et al.* (2013) noted that environmental factors such as skill levels, the regulatory infrastructure, and globalization had the greatest impact on supply chain competitiveness. However, this was followed by buyer-supplier relationships, cost performance, flexibility, quality, and delivery. Moser and Wohlfarth (2009) found that quality and cost were the most important factors related to supplier base management, but that suppliers were deficient in the areas of quality performance, technical capability, and management processes. They also noted that significant performance gaps existed between first tier suppliers which included international companies/joint ventures, and second and third tier suppliers that were largely small, resource constrained domestic companies. These studies notwithstanding, empirical research on supply chain management in India and Pakistan is limited.

Research framework

Effective execution of a supply chain strategy requires a firm to adopt a corresponding supply structure (Roh *et al.*, 2014). This in turn has an impact on the performance of supply chain partners (Fisher, 1997). The present study builds on prior work that characterizes supply chain strategy as having a primary emphasis on either leanness or responsiveness (Christopher *et al.*, 2006; Fisher, 1997; Goldsby *et al.*, 2006). The scope of inquiry is limited to buyer strategy, implications for supplier selection as reflected in supplier tactics, and buyer performance. This section develops the constructs for supplier tactics which follow from the two strategic orientations, and the proposed hypotheses that connect buyer strategy, supplier tactics, and buyer performance.

Lean-focussed supply chain strategy

Supplier quality practices. A lean supply chain strategy necessitates an organization developing partnerships with suppliers that emphasize product and process quality. Supply quality improves when suppliers are selected based on their quality focus and performance (Kaynak and Hartley, 2008). Similarly, strategic collaborative relationships with suppliers reduce opportunistic behavior by suppliers and improves quality outcomes (Loch and Wu, 2008). In such relationships, partners meet frequently to discuss mutual quality expectations (Monczka *et al.*, 1998). This strengthens social ties and enhances reciprocity and fairness, while reducing competition between partners (Sambasivan *et al.*, 2011). Suppliers will perceive the relationship as being more than merely transactional, and this can motivate them to meet their buyers' expectations by enhancing their own quality practices (Nyaga *et al.*, 2010).

A quality focussed buyer-supplier partnership can also be a source of competitive advantage with respect to customer satisfaction (Li *et al.*, 2006). Supplier quality practices directly impact the quality of final products and a buyer's operational effectiveness (Baird *et al.*, 2011). These practices are a key driver of a buyer's rejection rates, the cost of scrap and rework, and overall product quality (Sila and Ebrahimpour, 2005). Quality focussed suppliers can be a source of competitive advantage in terms of new product development, and thus enhance customer satisfaction and market performance (Oh and Rhee, 2010). Reductions in supplier quality failures can in turn improve the buyer's inventory, quality, and productivity performance. This plays an important role in increasing the buyer's brand loyalty, motivating repeat purchases, and attracting new customers (Berry and Waldfogel, 2010). We thus hypothesize:

H1a. A lean-focussed supply chain strategy is positively related to supplier quality practices.

H1b. Supplier quality practices positively influence a buyer's quality and market-based performance.

H1c. Supplier quality practices positively influence a buyer's operational performance.

Supplier cost effectiveness. Companies with a lean supply chain focus tend to select cost effective suppliers (Wang *et al.*, 2004). They may engage in development activities with key suppliers to understand and improve their suppliers' cost structures (Ahmadjian and Lincoln, 2001). They also meet with them on a regular basis to expedite the resolution of cost-related supplier issues (Sanders, 2007). Suppliers may be motivated to reduce their costs and improve their processes and technologies if they perceive cost effectiveness to be a key requirement of buyers (Hill, 1995). They can benefit as their cost structure improves and their commitment to waste reduction is recognized by buyers. This can in turn strengthen their bargaining position (Ahmadjian and Lincoln, 2001).

Supplier cost is directly related to the price of a buyer's final product or service. In addition to benefiting from their suppliers' cost reduction initiatives, lean-focussed companies may purchase in volume from selected suppliers to achieve economies of scale and further cost effectiveness (Lacity and Hirschheim, 1993). Reductions in supply costs thereby enable buyers to sell their products at lower prices than their competitors. This can positively influence customer satisfaction, customer retention, and market share. Reductions in a supplier's non-value-added activities can also reduce lead times and increase the buyer's productivity, thus enhancing the buyer's operational and quality performance (Gunasekaran *et al.*, 2004; Shin *et al.*, 2000). We therefore posit that:

H2a. A lean-focussed supply chain strategy is positively related to supplier cost effectiveness.

H2b. Supplier cost effectiveness positively impacts a buyer's quality and market performance.

H2c. Supplier cost effectiveness positively impacts a buyer's operational performance.

Responsiveness-focussed supply chain strategy

Supply flexibility. A supply chain that emphasizes responsiveness requires organizations to have flexibility at all echelons of the supply chain (Hopp *et al.*, 2010). Moreover, such supply

chains seek flexibility from both long- and short-term perspectives. The former means developing a supply base capable of adapting to structural changes in manufacturing technology, processes, and demand (Lee, 2004). The latter means having suppliers with the ability to meet short-term changes in demand (Gosling *et al.*, 2010). Clarity regarding the need for supply chain responsiveness can also be an important factor in tracking organizational efforts to achieve long- and short-run flexibility (Swafford *et al.*, 2006).

A flexible supply base provides a smooth flow of supplies that reduces the overstocking or understocking of inventory (Tang and Tomlin, 2008). It can help firms reduce safety stock, lead times, and the need for safety production capacity (Hopp *et al.*, 2010; Yusuf *et al.*, 2003). In addition, flexibility within the supply base enables organizations to introduce new products quickly, which in turn helps to satisfy both short- and long-term changes in demand (Swafford *et al.*, 2006; Khan and Pillania, 2008). New products can also help firms attract new customers if they have an early presence in the marketplace (Swafford *et al.*, 2008). We hypothesize:

H3a. A supply chain strategy with a responsiveness focus positively influences supply flexibility.

H3b. Supply flexibility positively influences a buyer's operational performance.

H3c. Supply flexibility positively influences a buyer's quality and market performance.

Supply delivery. Recognition of the importance of supply delivery is increasing as supply chains are becoming more complex and geographically dispersed (Ganesan *et al.*, 2009). Quick and reliable delivery of products downstream increases overall supply chain responsiveness (Lee and Whang, 1997). A supply chain strategy that emphasizes responsiveness thus encourages the development of fast and reliable supply sources (Chopra and Sodhi, 2004). Similarly, suppliers of responsiveness-focussed firms derive value from being able to respond in a timely manner to both scheduled and urgent buyer needs (Ha *et al.*, 2011).

Quick and flexible product delivery systems enhance a supplier's ability to reliably deliver products and services on time (Milgate, 2001). This has positive implications for a buyer's delivery reliability, as well as for its inventory costs, customer satisfaction, and competitive position (Beamon, 1999). For example, the ability of suppliers to deliver on time, both for routine and urgent orders, reduces stock-outs and overstocks on the part of the buyer, and thus corresponding costs (Ting and Cho, 2008). Moreover, it obviates the need for the buyer to purchase in bulk to reduce inventory costs and compensate for supply uncertainties (Li *et al.*, 2006). State-of-the-art delivery facilities and management systems can also help firms reduce inventory levels, time to market, and overall costs (Chen and Paulraj, 2004). We posit that:

H4a. A supply chain strategy with a responsiveness focus positively influences supply delivery.

H4b. Supply delivery positively influences a buyer's operational performance.

H4c. Supply delivery positively influences a buyer's quality and market performance.

Performance

Improvements in productivity, scrap and rework costs, and inventory levels, improve a firm's financial performance, thereby improving returns on investment, sales, and

assets (Kaynak, 2003). Moreover, the production and delivery of high-quality products increases a firm's ability to respond to changing customer demand, attract new customers, retain existing customers, and decrease customer rejections (Lin *et al.*, 2005). Hence:

H5a. Operational performance positively impacts financial performance.

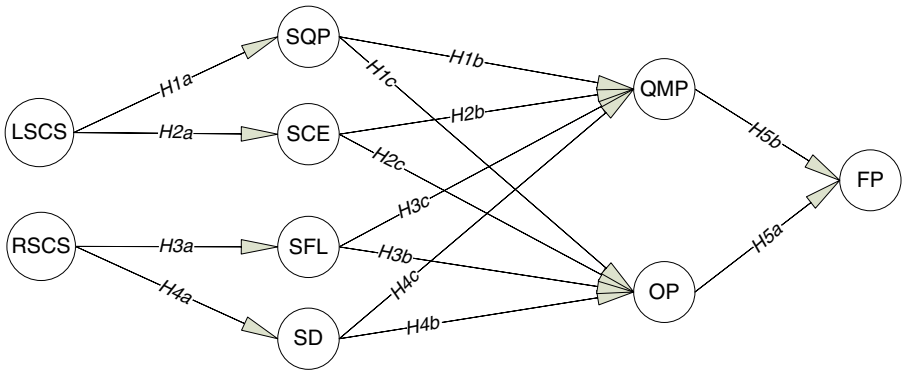
H5b. Quality and market performance positively impacts financial performance.

Figure 1 presents a model of the hypothesized relationships between buyer supply chain strategies, supplier tactics, and performance.

Research methodology

Survey instrument

A survey instrument was developed to collect data to test the hypothesized relationships. The first section of the instrument sought demographic information about respondents and the companies they represented. The remaining sections asked Likert scaled questions about the buying (respondent) firm's supply chain strategy, its suppliers' tactics, and measures of the respondent firm's performance respectively (Table I). Survey items were drawn from prior empirical studies. Kristal *et al.* (2010) explored two aspects of supply chain strategy, exploiting existing capabilities, and exploring new resources and opportunities. The work of Kristal *et al.* (2010) and



Construct	Code
Lean supply chain strategy	LSCS
Responsive supply chain strategy	RSCS
Supplier quality practices	SQP
Supplier cost effectiveness	SCE
Supply flexibility	SF
Supply delivery	SD
Quality and market performance	QMP
Operational performance	OP
Financial performance	FP

Figure 1.
Linkages between buyer supply chain strategies, supplier practices, and buyer performance

Number of employees	Frequency	Industry sector	Frequency
< 50	10	Automobile	31
51-100	23	Chemical/process plants	48
101-200	32	Engineering manufacturing	59
201-500	71	FMCG	27
501-1500	42	Pharma	15
> 1500	118	Textile	35
		Telecom/IT	31
		Others/ Not reported	50
Age of company (years)	Frequency	Export status	Frequency
0-5	33	Exporting	149
6-10	33	Non-exporting	147
11-15	66		
> 15	164		
Position of respondent	Frequency	Ownership	Frequency
Top managers	45	Local	198
Senior managers	180	Joint venture (JV)	33
Middle manager	40	Foreign	65
Others	31		

Table I.
Respondent profile

Tan *et al.* (2002) provided the background and motivation for items related to a lean supply chain focus. Similarly, studies by Qi *et al.* (2009) and Sánchez and Pérez (2005) on supply chain flexibility, agility, and strategy provided the basis for scales items related to a supply chain focus on responsiveness.

Sila and Ebrahimpour (2005) and Kaynak and Hartley (2008) offered insights for developing items on supplier quality practices, and the work of Shin *et al.* (2000), Yeung (2008), and Smytka and Clemens (1993) provided the basis for items on supplier cost effectiveness. Survey items on supply flexibility were based on studies by Sánchez and Pérez (2005) and Swafford *et al.* (2006), while Stewart (1995), Li *et al.* (2006), and Narasimhan *et al.* (2010) provided the basis for items on supply delivery. Items on performance were derived from studies by Brah and Chong (2004) and Qi *et al.* (2009) (operational performance), Brah *et al.* (2000), Zu *et al.* (2008), Kim and Lee (2010), and Kristal *et al.* (2010) (quality and market performance), and Vickery *et al.* (2003) and Chen and Paulraj (2004) (financial performance).

Data collection

The instrument, which was in English, was pre-tested by 30 managers who were familiar with their organization's supply chain activities. It was also reviewed by researchers familiar with the domain of the study. Based on their feedback, the instrument was revised and sent to 1,300 managers identified from two sampling frames: companies registered with the three large stock exchanges of Pakistan in Karachi, Lahore, and Islamabad (850), and with The Federation of Andhra Pradesh Chamber of Commerce and Industry and Bangalore Chamber of Commerce and Industry, both in India (450). Target respondents consisted of middle to top managers in the relevant functional departments of the selected companies. The total design methodology of Dillman (2007) was used to guide data collection. The questionnaire and a cover letter requesting participation, and, where relevant, that the instrument be directed to the appropriate individual, were sent electronically to respondents. Follow up was carried out using telephone calls, e-mails, and personal visits.

A total of 397 (255 from Pakistan, 142 from India) questionnaires were returned, of which 101 were incomplete. This yielded a total of 296 (191 from Pakistan, 105 from India) useable responses, an effective response rate of 22.77 percent. A profile of the sample used in the analysis is shown in Table I.

Results

Measurement models

As described above, scale items were derived from existing literature and subject to pre-testing. As such, content validity can be considered to have been established. All constructs had values of Cronbach's α well in excess of 0.70 (Table II), providing evidence of construct reliability (Nunnally and Bernstein, 1994). To improve convergent and discriminant validity, items that had factor loadings of less than 0.60 were deleted. Values of average variance extracted (AVE) in excess of 0.50 for each construct provided satisfactory evidence of the convergent validities of constructs (Segars and Grover, 1993).

To test for discriminant validity, χ^2 difference tests between pairs of constructs were carried out. Values of AVE for each construct were greater than their squared inter-construct correlations with other constructs, thereby establishing discriminant validity (Segars and Grover, 1993). Results also indicated that all constructs had values of comparative fit index (CFI) in excess of 0.90 in a single-factor confirmatory factor analysis (CFA) model, thus satisfying uni-dimensionality requirements. CFA of all variables yielded acceptable overall model fit ($\chi^2 = 937$; df = 593; $\chi^2/\text{df} = 1.58$; RMR = 0.036; RMSEA = 0.044; CFI = 0.952; TLI = 0.947; IFI = 0.953; NFI = 0.88).

To establish whether common method bias was present, the Harmon single-factor test (Podsakoff *et al.*, 2003) was carried out. CFA results indicated that a single component factor of all items explained 33.14 percent of total variance, less than the 50 percent that is indicative of bias. In addition, a significant rise in the value of χ^2 ($\Delta\chi^2_{36\,\text{df}} = 3{,}457$) from a single-factor model to a model in which items were loaded onto their respective latent factors also indicated the absence of common method bias.

Structural model

Figure 2 shows the results of the test of the structural model. The model was tested using AMOS structural modeling software. The values of multiple fit indices suggested good model fit ($\chi^2_{701\,\text{df}} = 1{,}127.6$; $\chi^2/\text{df} = 1.609$; CFI = 0.939; IFI = 0.940; TLI = 0.932; NFI = 0.856; RMSEA = 0.045) (Segars and Grover, 1993).

Results indicate that with one exception, there is support for the hypotheses. Path coefficients indicate that firms whose supply chain strategy emphasizes leanness, focus on supplier quality practices ($\beta = 0.365$) and cost effectiveness ($\beta = 0.394$) in making decisions regarding which suppliers they partner with (*H1a*, *H2a*). Similarly, firms whose primary strategic orientation emphasizes agility focus on supplier flexibility ($\beta = 0.387$) and delivery capability ($\beta = 0.465$, *H3a*, *H4a*). For firms with a lean focus, both supplier quality practices and cost effectiveness positively influence quality and market performance. As might be expected, supplier quality practices have a greater relative impact ($\beta = 0.406$) on quality and market performance than does a focus on cost ($\beta = 0.206$, *H1b*, *H2b*). While supplier quality practices positively impact operational performance ($\beta = 0.343$), the relationship between supplier cost effectiveness and operational performance is not statistically significant ($\beta = 0.024$, *H1c*, *H2c*). Supplier flexibility has a greater influence on operational performance

Construct	Items	Factor loadings	Cronbach's α	CFI
Lean supply chain strategy (LSCS)	*In meetings and communications, our top management highlights that*		0.88	0.99
	1. Our supply chain practices are designed to provide high quality products/services	0.81		
	2. All supply chain partners should maximize quality for the end customer	0.87		
	3. All members of our supply chain should team up to maximize value for the end customer	0.79		
	4. Minimizing cost throughout the supply chain is important for our business	0.76		
Responsive supply chain strategy (RSCS)	*In meetings and communications, our top management highlights that*		0.91	0.99
	1. Our supply chain should be able to economically satisfy variation in demand	0.80		
	2. Our supply chain should be capable of developing new products before competitors	0.77		
	3. Reduction of delivery lead time is important	0.86		
	4. Delivery of the latest technology products/ services to our customers is essential	0.87		
	5. Our supply chain adjusts proactively to satisfy customers' new needs	0.79		
Supplier quality practices (SQP)	*Our key suppliers*		0.93	0.97
	1. Quality is the top criteria when we select our suppliers	0.89		
	2. Are quality conscious in their interactions with us	0.86		
	3. Do not train their employees on the latest available technology[a]	b		
	4. Have effective quality management programs	0.83		
	5. Give the highest importance to our satisfaction	0.89		
	6. Continually train their employees on the latest management techniques	0.75		
Supplier cost effectiveness (SCE)	*Our key suppliers*	0.86	1.0	
	1. Continuously invest in in-house operations to reduce cost	0.81		
	2. Seek help from us in reducing their costs	b		
	3. Do not have access to low cost raw material[a]	b		
	4. Use statistical process control to reduce rework and waste	0.82		
	5. Discourage wasted time and non-value-added activities	0.84		
Supply flexibility (SFL)	*Our key suppliers can*		0.83	1.0
	1. We can efficiently restructure our supplier base in case of long-term changes in the market, the regulatory infrastructure, or our competitors' strategies	0.72		
	2. Not economically meet our unscheduled demand[a]	b		
	3. Produce small batch sizes economically	b		

Table II.
Measurement Items and factors loadings

(*continued*)

Construct	Items	Factor loadings	Cronbach's α	CFI
	4. Modify their products/services in a short period of time	0.81		
	5. Economically deliver a large variety of products/services	0.82		
Supply delivery (SD)	*Our key suppliers*		0.88	0.99
	1. Never deliver supplies on time[a]	b		
	2. Have very short delivery lead times	0.80		
	3. Can economically transport small batch sizes	0.83		
	4. Have high quality transportation systems	0.81		
	5. Cannot speed up urgent delivery processes[a]	b		
	6. Have cost effective transportation systems	0.75		
Operational performance (OP)	1. Productivity	b	0.85	1.0
	2. Cost of scrap and rework[a]	0.66		
	3. New product development time[a]	0.78		
	4. Inventory level[a]	0.83		
	5. Delivery lead time[a]	0.76		
Quality and market performance (QMP)	1. Market share	0.83	0.90	0.93
	2. Market share growth rate	0.83		
	3. Brand acceptance	0.85		
	4. Reject rate of customers[a]	b		
	5. Repeat purchases by customers	0.70		
	6. Response time to changing market needs[a]	b		
	7. Customer satisfaction with product/service quality	0.75		
Financial performance (FP)	1. Revenue growth	0.85	0.90	0.99
	2. Overall profitability	0.86		
	3. Return on assets	0.81		
	4. Return on sales	0.82		

Notes: Questions for constructs LSCS, RSCS, SQP, SCE, SFL, SD answered using five-point Likert scales, 1 = strongly disagree, 5 = strongly agree. Questions for constructs OP, QMP, FP answered using five-point Likert scales, 1 = below competition average, 5 = above competition average. [a]Item reverse coded. [b]Items deleted due to factor loading < 0.60

Table II.

($\beta = 0.313$) than does delivery capability ($\beta = 0.185$, *H3b*, *H4b*). For firms with a primary strategic focus on responsiveness, both supplier flexibility ($\beta = 0.293$) and delivery capability ($\beta = 0.235$) have a positive influence on quality and market performance (*H3c*, *H4c*). Operational performance ($\beta = 0.264$) has a weaker positive influence on financial performance than does quality and market performance ($\beta = 0.663$, *H5a*, *H5b*).

The model was also tested to examine whether supplier tactics mediated the relationship between buyer supply chain strategy and performance. Paths between the two strategy constructs and the two performance constructs were added to the structural model including control variables (Little *et al.*, 2007; Baron and Kenny, 1986). The model yielded acceptable fit ($\chi^2_{722\,\mathrm{df}} = 1{,}171.9$; $\chi^2/\mathrm{df} = 1.623$; CFI = 0.938; IFI = 0.939; TLI = 0.930; NFI = 0.855; RMSEA = 0.046). None of the direct relationships between strategy and performance were significant ($p > 0.10$), but as with the original model, there was significant support for all hypothesized relationships except hypothesis *H2c*. This provides empirical evidence that supplier tactics fully mediate the relationship between buyer supply chain strategy and performance.

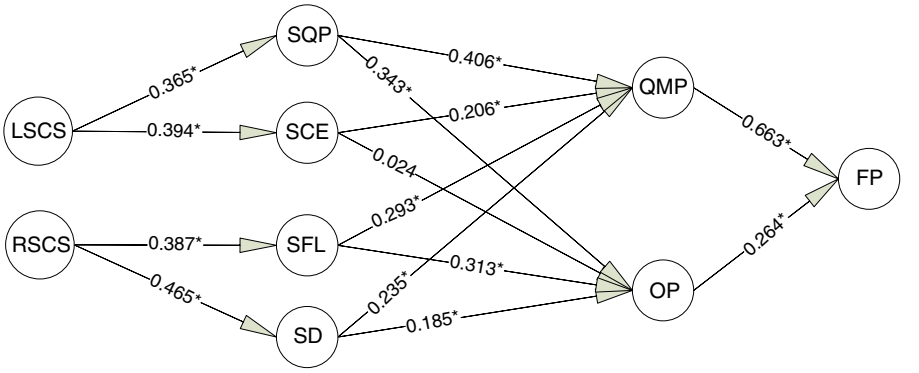


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Figure 2.
Structural model showing path estimates

Note: *$p < 0.01$

Contingency analysis

Prior research has suggested that organizational demographics can influence relationships between strategy, supplier behavior, and, buyer performance (Yeung, 2008; Reed and Walsh, 2002; Qu and Brocklehurst, 2003; Jajja *et al.*, 2014b). To obtain a more nuanced understanding of the relationships underlying the results described above, the structural model was tested for the contingent effects of four variables; company age ($\leqslant 15$ years, > 15 years), size ($\leqslant 500$ employees, > 500 employees), ownership (local, joint venture/foreign), and exporters/non-exporters.

While in most cases path coefficients were statistically significant irrespective of the level of contingent variable (Table III), several important exceptions emerged. The most notable reflected whether a company exported or not and the relationship between supplier delivery and operational performance (*H4b*). Specifically, for non-exporters, neither supplier cost effectiveness nor flexibility influenced operational or quality and market performance. Similarly, supplier delivery influenced operational performance only for older companies, those with some level of foreign ownership, and exporters.

Discussion and conclusion

While it is reasonable to expect that the alignment of a buyer's supply chain strategy with the capabilities of its suppliers is a driver of buyer performance, the results provide empirical evidence of the underlying relationships. Moreover, they show that

Hypothesis	Size		Age		Ownership		Export	
	Large	Small	New	Old	Local	JV/foreign	No	Yes
H1a: SCLF → SQP			0.070					
H1b: SQP → QMP								
H1c: SCE → OP	0.344	0.104			0.114	0.278	0.398	
H2a: SCLF → SCE								
H2b: SCE → QMP	0.107					0.101	0.147	
H2c: SQP → OP								
H3a: SCRF → SFL								
H3b: SFL → OP							0.380	
H3c: SFL → QMP							0.199	
H4a: SCRF → SD								
H4b: SD → OP			0.412		0.087		0.179	
H4c: SD → QMP								
H5a: OP → FP						0.065	0.079	
H5b: QMP → FP								

Table III.
Contingency analysis (p-values > 0.01)

supply chain relationships among firms in India and Pakistan are consistent with those in more advanced economies. Firms with a strategic focus on responsiveness or on being lean can achieve higher levels of performance by partnering with suppliers whose internal systems are similarly oriented. Suppliers are in effect extensions of producer firms. The appropriate selection of suppliers thus enables them to help in the effective execution of the buying firm's strategy. As noted by Moser and Wohlfarth (2009) however, large differences exist between the capabilities and resources of first tier and lower tier suppliers in India, and it is likely the same case in Pakistan. This puts a burden on firms to identify appropriate suppliers from what may be a relatively small pool. Moreover, an additional challenge may exist in that an organization's competitors may utilize the same pool of suppliers.

Consistent with prior research, the results show that supplier commitment to quality improvement translates directly to positive measures of the buyer's operational performance (Kaynak and Hartley, 2008, Kannan and Tan, 2006). Similarly, firms with flexible and reliable suppliers enjoy high levels of operational, quality, and market performance, consistent with findings regarding the significance of supplier base flexibility and delivery (Prajogo *et al.*, 2012; Gosling *et al.*, 2010; Liao *et al.*, 2010). As highlighted by Joshi *et al.* (2013), cost, quality, flexibility, and delivery are key determinants of supply chain competitiveness in India. As noted above however, variation in capability is a key reality of the supplier pool. The results thus highlight the importance of alignment between an organization and its suppliers. They also suggest that organizations that can overcome barriers to flexibility such as those attributable to poor infrastructure and government policies, key drivers of supply chain competitiveness (Joshi *et al.*, 2013), will be at a competitive advantage.

The results do not suggest a direct relationship between suppliers' commitments to cost effectiveness and buyers' operational performance. This may reflect survey respondents not knowing about, considering, or fully appreciating the impact of suppliers' efforts to reduce waste on downstream production activity, and thus not fully leveraging cost reduction potential. It may also be a function of the relatively low diffusion of lean manufacturing practices (Panizzolo *et al.*, 2012). This is in turn the result of cultural norms and a limited talent pool with the corresponding skill set. However, given the importance of cost as a driver of supply chain competitiveness

among Indian firms (Saad and Patel, 2006; Joshi *et al.*, 2013, Moser and Wohlfarth, 2009), it represents a significant opportunity. Consistent with the observation of Moser and Wohlfarth, it also suggests the value of greater supplier development efforts. While supplier development is an accepted practice in developed markets such as those in the USA and Japan, it is not clear to what extent it is accepted or routinely practiced in India and Pakistan. As Panizzolo *et al.* (2012) imply however, cultural factors and the relatively small pool of managers and engineers with the requisite skills may constrain development efforts. In contrast, for firms whose strategic orientations emphasize responsiveness, efforts to partner with suppliers that act quickly and are responsive to change are not only viewed favorably by the marketplace, they effectively support the firm's efforts with respect to time-based competition. As observed in developed markets, increases in income and consumer sophistication coupled with technological innovation have led to product life cycles becoming shorter in many industrial sectors. The implications for markets such as those in India and Pakistan in which incomes are rising, are thus considerable.

The results of the contingency analysis are particularly informative. The observation that supplier cost effectiveness and flexibility positively influence operational and quality and market performance for exporting companies but non-exporters, suggests that pressure to compete internationally has had a positive effect on how some buyers interface with their suppliers. The fact that supplier delivery influences operational performance only for older companies, companies with at least partial foreign ownership, and those that export, further suggests that companies with greater maturity in managing the supply chain can yield dividends. It may also be a reflection of these companies being better positioned to form supply partnerships with international companies/joint ventures whose technical and management development are at a higher level than that of domestic suppliers (Moser and Wohlfarth, 2009). It should be noted that only 49 percent of the locally owned firms in the sample were exporters, thus highlighting the potential for future supply chain performance improvements.

Rising incomes and customer expectations coupled with challenges associated with access to and availability of resources are changing the competitive landscape in India and Pakistan. Organizations that are able to effectively leverage their supply chains will be better positioned to respond to these challenges than those that are not aligned with supply chain partners. In addition, for firms in India and Pakistan seeking to establish themselves as viable sources of supply in international markets, raising quality, lead time, and cost performance will be essential. This can again be achieved more effectively by leveraging opportunities across the supply chain rather at the level of the organization alone. With increasing supply chain costs in established developing country locations such as China, opportunities exist for organizations in India and Pakistan. However, they will not be seen as legitimate alternatives if they cannot offer comparable, if not higher, quality and flexibility at a lower cost. The results presented in this study offer empirical support for the critical mediating role of supplier functions on buyer performance, and thus of the impact of effective supply chain alignment. They also highlight the need to overcome the lack of experience managers have in managing performance and establishing performance cultures (Panizzolo *et al.*, 2012).

The study is not without its limitations. It utilized relatively small samples drawn from two countries which share a number of economic, cultural, and social characteristics. However, the implicit assumption is that the countries are homogeneous enough that sample data could be combined. Larger samples from each country would have provided greater confidence in making such assumptions, and enabled comparative analysis that

identified differences in supply chain practices in the countries. The sample sizes also meant that the number of responses from individual industrial sectors was small. Larger samples would have enabled contingency analysis to be conducted across industries, and allowed more nuanced conclusions to be drawn.

The current work also suggests potential extensions. While the present focus is on the Indian sub-continent, a logical next step is to explore whether the results generalize to other developing market contexts, particularly elsewhere in Asia. The expansion of the manufacturing sector in countries such as Thailand and Vietnam, decreasing cost and capability differentials between manufacturing in China and other emerging markets in Asia, and other factors including government policies that promote domestic production, are motivating firms to explore new manufacturing and sourcing locations. Understanding the interplay between buyers and suppliers regarding strategy and execution is thus germane. A related issue is that of the integration of suppliers with buyers. While several studies in the supply chain management literature have examined the concept of supply chain integration, this has again been anchored in the context of developed economies. As the results of the present study indicate, aligning buyer strategy with aspects of supplier execution is an important issue. This has important implications with regard to integration that have not previously been explored.

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