An empirical study of the relationships among strategic purchasing, supply chain capabilities and performance: SEM approach

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The purpose of the study is to examine the sequential relationships among the six factors: the strategic purchasing (SP) to supply chain capabilities in terms of (bilateral communications and information sharing, supplier relationships and involvement, and the number of partners and level of trust and organization financial performance (FP) and non-financial performance (NFP). Using data from UAE and employing Structured Equation Modeling, findings show that SP has a significant positive effect on supply chain capabilities, and the supply chain capabilities have a strong positive effect on FP. However, SP and supply chain capabilities have moderate effects on NFP and strong effect on FP. This points out that the organizations in UAE are likely to emphasize SP and supply chain capabilities to achieve FP. Conversely, the moderate relationship with NFP highlights that the organizations show less concern for NFP in emerging markets such as UAE.

Keywords: SEM, strategic purchasing, supply chain, performance

Received on Dec 8, 2019; Revised on Jan 30, 2020; Accepted on Mar 16, 2020

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Introduction

Prior to oil crises in early 70s, managers viewed purchasing as a sedentary function role in the business organization (Ammer 1989). However, the major turning point of purchasing strategy started when the significance of the bargaining power began to impact the competitiveness in industry. Since the 80s, organizations started shifting their attitude towards purchasing's role in business strategy. During this period purchasing was considered as supportive function certifying that supplier quality met the production standards. Extant literature indicates a movement toward integrating purchasing into the business's strategic planning process. Today a number of firms realized the ability of purchasing that impacts strategic planning has increased (Carter & Narasimhan 1996). Carter and Narasimhan (1996) noted that "the difference today is that the ability of purchasing to impact strategic planning has increased." Several organizations such as Honda, Ford Motor Company and Siemens Medical system have benefited from strategically-managed purchasing activities (Chenlung et al. 2013, Pressey et al. 2009).

Recently, organizations began to adopt supply chain management (SCM) practices to improve their performance. When SCM was gaining attention in both practice and the academic literature, the concept of strategic purchasing (SP) has also been expanding. Accordingly, the role of purchasing function has changed significantly—from a transactions-oriented function to a higher strategic level function with an emphasis on SCM (Stanley & Wisner 2001). Cousins (2005) contended that purchasing function has been

recently viewed as a main activity that adds value to the process and is considered strategically essential to the success of supply chain organizations. Further, SP means considering the purchasing function to be equally important with other basic functions within the organization such as operations, finance, and marketing (McIvor et al. 1997). It is evident that purchasing is integral to supply chain management (Fantazy et al. 2010, Novack & Simco 1991).

Even though SP and SCM are integral to each other, only a few studies have investigated the impact of SP on supply chain capabilities. For example, some studies that investigated the impact of purchasing on supply chain performance were limited to the manufacturing industry in developed countries (Chen et al. 2004). We expect to see if there are regional distinctions in developing and emerging markets (DCEM); for example, the Middle East. Hence we propose to examine the link among SP, supply management capabilities, and financial and non-financial performance (FP and NFP) in the United Arab Emirate (UAE) manufacturing industry. We use Structural Equation Modeling (SEM) in the LISREL statistical software as it provides a robust basis for empirically verifying relationships.

We make both conceptual and empirical contributions. First, this research extends the existing supply chain literature by suggesting that SP in DCEM face more challenges to SP than supply chains operating in developed countries. Second, due to the highly uncertain business environments and organizational structure that can be found in emerging markets, companies in those countries play an even more important role in supporting and leading supply chain learning efforts, elevating purchasing function, and developing processes to build more SP practices within their supply chains. The empirical contribution relates to the three main findings. First, this research explores the comprehensive multidimensional measures of SP, bilateral communications and information sharing, supplier relationships and involvement, level of trust, financial and non-financial performance as conceptualized in the literature and provides empirical evidence that SP and supply chain capabilities that enhance organizational performance (financial and non-financial) are essential because the SP development involves complex practices that require substantial collaboration from all its members. Second, this research examined the direct relationship between SP and FP and NFP, which were limitations of previous frameworks. Finally, it appears that this research is the first to test the relationships among SP, supply chain capabilities, and performance.

In the following sections, we develop a synthesis of the recent literature to provide a conceptual foundation for the framework, explain the research model and hypotheses, outline the research methodology of the empirical study, present the LISREL research structural model, provide results and data analysis, and present a discussion and implication of the research study. Finally, we conclude with the limitations of the study and directions for further research.

Literature Review

Literature shows that the issue of SP has been extensively discussed in theory. Consequently, the purchasing and supply management practice–performance link has undergone successful but limited empirical investigation exists. Although most studies report a positive relationship between SP practices and firm financial performance, it remains unclear whether and to what extent SP practices relate to supply chain capabilities and non-financial performance (Hesping & Schiele 2015, Yeung et al. 2015, Zimmermann & Foerstl 2014). Carr (2000) empirically evaluated SP practices in Taiwan which included three factors in this model: purchasing risk taking, purchasing knowledge and skills, and strategic purchasing. Their findings indicate that purchasing risk-taking impacts purchasing knowledge and skills and purchasing knowledge and skills and SP for high performing firms are stronger than for low performing firms. Similarly, Chen et al. (2004) proposed a model of strategic supply management and argued that SP can stimulate sustainable competitive advantage by enabling firms to: (1) foster close

working relationships with a limited number of suppliers; (2) promote open communication among supply-chain partners; and (3) develop long-term strategic relationship orientation to achieve mutual gains. The results of the US-based study provide support for the links between SP, supply management, customer responsiveness, and financial performance of the buying firm.

On the other hand, Paulraj et al. (2006) did not examine strategic purchasing model per se; they highlighted the growing importance of SCM that led to an increasing recognition of the strategic role of purchasing, which has recently evolved and expanded from buying to procurement and supply management. The authors characterized firms into three strategic purchasing stages the strategic focus, strategic involvement of the purchasing function and the status and visibility of the purchasing professionals. The study provides support for the importance of SP by showing that, by moving towards the more advanced stages, firms at the emerging stage of SP can achieve better supply integration. The finding of this study further revealed that SP can have a significant impact on supply chain performance for both buyer and supplier firms. Ogden et al. (2007) explored antecedents associated with SP from the existing literature; purchasing's skills, knowledge, and professionalism, purchasing's status within the organisation, and purchasing's sophistication in managing external relationships in the North American and European countries. The results indicate that differences exist among several countries within these three SP factors, and that purchasing departments with greater strategic position have higher scores on these factors than other purchasing departments. Sanchez-Rodriguez (2009) developed and tested a model that shows the relationships between SP and supplier development as constructs that could have the potential to contribute to create value for the buying firm in terms of better purchasing performance. SP impacts directly on purchasing performance and indirect impact of purchasing performance through supplier development. Thrulogachantar and Zailani (2010) conducted a study in Malaysia to examine the impact of purchasing strategies as a key component function in organizations contribution on manufacturing performance. The results of the study revealed that purchasing strategies have significant positive impact on manufacturing performance which comprises the competitive priorities of the firms in terms of quality, cost, cycle time, new product introduction time line, delivery speed and dependability and finally, customization responsiveness performance.

Karjalainen and Salmi (2013) conducted a comparative empirical study to identify the similarities and differences between the continental purchasing strategies and tools of companies in Western Europe and North America. Their findings indicate that European companies value price reduction and total cost as strategic objectives whereas North American companies emphasize compliance with social and ethical guidelines. The study also reported that, both groups place little emphasis on environmental objectives. However, in terms of tools, North American buyers have higher utilization of electronic tools in purchasing and in communicating with suppliers, while European buyers appear to more extensively use purchasing tools associated with rating and auditing suppliers. In another study, Hartmann et al. (2012) conducted an empirical study of purchasing and supply management of U.S. major manufacturing companies across the eight industry sectors. They found that strategic purchasing and supply management has a direct effect on financial success, which in turn indirectly affects financial performance through three operational performances (cost, quality, and innovation performance). Chen-Lung et al. (2013) examined the effects of purchasing activities and the purchasing function's involvement with corporate strategy on manufacturing competitiveness. The results suggested that the intensity and efficacy of purchasing activities and strategic involvement vary between Asia and Western Europe/USA. The samples adequately fit the purchasing model, but the Asian samples do not. The findings suggested that national differences matter in implementing purchasing activities.

Hesping and Schiele (2015) presented a conceptual framework claiming it is the state of the art in the purchasing strategy literature. In an effort to conceptualize the research field, this study extended existing stages of strategy development in purchasing by developing a comprehensive framework integrating sourcing categories and sourcing levels as levels of analysis. The proposed framework has been structured

as a hierarchical framework fostering a multi-stage understanding of strategy development in purchasing. The authors used a hierarchy of stages that emerges when general strategy is disaggregated into executable and controllable activities. They have suggested five levels of strategies: (1) firm strategy; (2) purchasing strategy as a particular functional strategy; (3) category strategies for the multitude of supply markets; (4) effectuation by a set of tactical sourcing levers; and (5) strategies for each supplier within a sourcing category. Based on earlier SP literature, Yeung et al. (2015) underlined that SP has direct and indirect positive associations with suppliers' performance. They argued that an inequity perception may affect transaction-cost calculus and lead to alliance failure if overlooked. Findings indicate that negative inequity perceptions exist from buyer's perspective and the strategic purchasing—quality perception assumption should be augmented to the basic transaction cost economics framework. Given the discussion, we investigate the issue of SP further and develop and test relationship among the variables selected from prior studies in the context of emerging markets.

Hypotheses Development

Figure 1 represents the conceptual framework linking SP with supply management capabilities and performance. In recent years, practitioners and academics have adopted a long-term relationship approach to explain how buyer-supplier relationships can be a source of competitive advantage (Rodríguez 2009). Strategic purchasing is creating an effective supply chain that requires that all players within the chain should be linked and they work toward achieving customer needs (Carr & Pearson 2002, Carr & Smeltzer (1997). This would necessitate developing a strategic plan for individual customers (buyers), and consequently realign the supply chain's capabilities to fit the end customer demand. Equally, the buying firm's supply management tasks should be strategically adjusted to match the overall goals and business strategies of the supply chain. This suggests that SP should precede the adoption of supply management capabilities, including bilateral communications and information sharing (BC_IS) (Chen et al. 2004), supplier relationships and involvement (SR_I) (Seth et al. 2006), the number of supply chain partners, and the level of trust (NP_LT) among partners (Paulraj et al. 2008).





Three components of the manufacturing supply chain have been identified from the literature on SP. These components have been combined to develop a framework and seven related hypotheses of FP and NFP from the SP perspective though the supply management capabilities identified in our study is not exhaustive. Other capability dimensions that are of great interest – such as collaboration, agility, resource sharing, and knowledge and joint learning (Cao et al. 2010) – are not included due to the length of the survey and the concerns regarding the parsimony of this research. The three components and their

relevant hypotheses are shown in Figure 1 and discussed in the following sections. SP is the first component identified from the supply chain perspective. Most studies have highlighted the strategic nature of the purchasing strategy (Chenlung et al. 2013, Fantazy et al. 2010, Karjalainen & Salmi 2013). They have argued that purchasing has a crucial role in the management of a firm's resources, developing from a buying function to becoming a strategic partner in the supply chain (Ellram & Carr 1994). We join other researchers to support the argument that purchasing cannot take a place in the firm's strategy until it is viewed as strategic.

Our first hypothesis is concerned with the relationship between SP and BC_IS. Carr and Smeltzer (1999) have shown that firms with SP are more likely to be able to achieve information integration in addition to relational integration. Kraljic (1983) suggests that a SP focus is conducive to BC_IS throughout the supply chain. The link between SP and bilateral communications is well established in the literature. Empirical studies and theoretical studies support the link between SP and BC_IS. One of the empirical studies that examined the relationship between SP and bilateral communications was conducted by Paulraj et al. (2006). Studies have shown that having SP sustains BC_IS, which is critical to achieving effective integration throughout the supply chain (Cox 1996, Fantazy et al. 2010). The literature also suggests a theoretical relationship between SP and bilateral communications and provide support for the existence of a contingency-based relationship between SP and the BC_IS adopted by a firm (Chen et al. 2004, Spekman et al. 1995). So we propose to test the following hypothesis:

H1. Strategic purchasing has a positive effect in the development of purchaser-supplier bilateral communication and information sharing.

The second hypothesis deals with the interaction between the SP and SR_I. The importance of strategic relationships with suppliers has grown in prominence since purchasing has become more strategic in nature (Carr & Pearson 2002, Rodriguez 2009). A long-term relationship is an extended cooperative arrangement between two or more independent firms that engage in business activities for mutual economic gains (Smith et al. 1995). Our second hypothesis is based on the premise that a supply chain is a cooperative or close relationship. A cooperative or close relationship implies an ongoing relationship between two firms involving a commitment over an extended time period, a mutual sharing of information, and the risks and rewards from this relationship (Ellram & Hendrick 1995). Through maintaining such close and long-term relationships among the firms and their suppliers, SP enables the cultivation of greater commitment and trust, which are central to the supply chain objectives. Studies support the link between SP and SR_I. Some of the empirical studies examined the relationship between SP and SR_I were by (Paulraj & Chen 2005, Rodriguez 2009). The literature has also suggested a theoretical relationship between SP and SR_I (Chen and Paulraj, 2004). Hence we hypothesize that:

H2. Strategic purchasing has a positive effect in the development of close relationships with suppliers and their involvement.

The third hypothesis deals with the relationship between SP and the NP_LT. The level of trust increases the willingness of parties to make relationship-specific investments such as human and information systems, which can be leveraged for advantage in the marketplace (Dyer 1997, Hesping & Schiele 2015). Development of partnership and building a high level of trust involve behavioral and economic issues such as trust and asset specificity (Aulakh & Gencturk 2000). Close relationships with suppliers, where trust and cooperation is vital, rather than competition and opportunism, is thus recommended as an avenue for value creation. Studies support the link between SP and NP_LT. For example, the empirical study by Golicic and Mentzer (2006) on examination of relationship magnitude in terms of trust, partnership commitment,

and dependence as independent variables contributes to the relationship value. So we propose to test the following hypothesis:

H3. Strategic purchasing has a positive effect in the development of purchaser and supplier partnership and in building a high level of trust.

The fourth hypothesis examines the relationship between supply chain capabilities and FP and NFP. Supply chain capabilities and SP enhance supply chain performance (Carr & Smeltzer 1999, Hartmann et al. 2012). This hypothesis specifically deals with the relationship between BC_IS and FP and NFP. With appropriate BC_IS, it is possible to enhance performance in terms of reduced costs and improved customer service levels. Therefore, integrating effective supply chain practices with effective information sharing becomes critical for improving the supply chain performance. So we test the following hypotheses:

H4a. The level of bilateral communication and information sharing between purchaser and supplier has a positive effect on financial performance (net profit).

H4b. The level of bilateral communication and information sharing between purchaser and supplier has a positive effect on non-financial performance (customer satisfaction).

Next, we examine the relationships between SR_I and performance (FP and NFP). Several authors have emphasized the importance of supplier involvement in the supply chain (Karjalainen & Salmi 2013, Song & DiBenedetto 2008). Strategic purchasing has been identified as a critical antecedent of supplier involvement in the buyer's new product development process (Rodriguez 2009). Similarly, supplier development has also been acknowledged to be a critical element of collaborative buyer-supplier relationships and has been identified as playing a critical role in improving a supplier's capabilities and performance (Krause et al. 1999, Krause et al. 2000). So we propose the following hypotheses:

H5a. The close relationships with suppliers and their involvement has a positive effect on financial performance (net profit).

H5b. The close relationships with suppliers and their involvement has a positive effect on non-financial performance (customer satisfaction).

Other aspects in the research model are the relationships between supply chain partnership and building a high level of trust and performance. In this hypothesis we examine the relationships between NP_LT and performance (FP and NFP).Through maintaining close and long-term relationships among firms and their suppliers, aligning supply chain capabilities cultivates greater commitment and trust, which are essential to the supply chain performance (Madhok & Tallman 1998). Reducing the number of supply bases representing the maintenance of collaborative relationships and having fewer high quality suppliers are also distinctive features of modern buyer-supplier relationships (Helper 1991). Strategic supplier alliances and partnerships can become competitive advantages through the development of long-term mutually beneficial relationships that improve overall performance (Kannan & Tan 2003). Handfield and Bechtel (2002) found that greater trust with key suppliers can improve supply chain performance in terms of responsiveness. So we propose the following hypotheses:

H6a. Partnership and building high levels of trust have a positive effect on financial performance (net profit). H6b. Partnership and building high levels of trust have a positive effect on non-financial performance (customer satisfaction). The final hypotheses examine the direct relationship between SP and FP and NFP. According to the research model, supply chain capabilities play a mediating role between strategic purchasing and performance. The direct effects of SP on performance have been put forward by several researchers (Hesping & Schiele 2015, Rodríguez 2009). SP practices that are well developed, appropriately implemented, and controlled have a positive effect on a firm's performance (Bracker et al. 1988). Therefore, the participation of purchasing in the strategic planning practice of the company (e.g. strategic purchasing) should also have a positive effect on the performance. Thus, we expect that strategic purchasing efforts should lead to increased performance both directly and indirectly, mediated by supply chain capabilities. So we propose to test the following hypotheses:

H7a. Strategic purchasing has a direct positive impact on supply chain financial performance H7b. Strategic purchasing has a direct positive impact on supply chain non-financial performance

Methodology

The questionnaire was divided into seven main sections: organizational information, SP, BC_I, SR_I, NP_LT, FP, and NFP. Table 1 lists factor loading (from Exploratory Factor Analysis (EFA) values using varimax rotation technique), standard errors, t-value, and the measurements of internal reliability (Cronbach's alpha (α) values) of all constructs in this research model. All the variables were measured on a 7-point scale where 1=*Strongly Disagree*, 7=*Strongly Agree*.

Operational Measures of the Variables

Organizational information. This section collects information on the profiles of the organizations. Information collected includes firm name, address, respondent's position within the organization, type of business, number of employees in the organization, approximate turnover, and whether the organization is certified to ISO 9000.

Strategic purchasing (SP). The 10-item scale to measure SP was designed with reference to the strategic supply management model (Carr & Smeltzer 1999, Lawson et al. 2009, Paulraj & Chen 2005). Respondents were asked to indicate the key SP practices in the managing supply chain.

Bilateral Communications & Information Sharing (BC_IS). A 7-item scale was designed to measure BC_IS with reference to the strategic supply management model (Carr & Smeltzer 1999, Paulraj & Chen 2005). This section is related to the level of BC_IS between the firms and their supply chain partners. The EFA reveals that five out of seven items loaded highly (i.e. convergence).

Supplier relationships and involvement (SR_I). A 9-item scale was used to measure the relationship between supply chain partners (Paulraj et al. 2008). The criteria were concerned with several key practices related to managing supplier relationship. Seven out of nine items loaded highly.

Number of Partners and Level of Trust (NP_LT). A 5-item scale was used to measure the number of supply chain partners and level of trust (NP_LT) with reference to the key practices related to managing supply chain partnerships (Ryu et al. 2009). All items loaded highly.

Financial Performance (FP). A 3-item scale (1=Very weak, *7=Excellent*) was used to measure a firm's financial performance. Respondents were asked to rate overall financial performance in terms of net profit, return on investment, and sales growth (Cao & Zhang 2011, Fantazy et al. 2009, Gunasekaran 2004). All items loaded highly.

Non-Financial Performance (NFP). Non-financial performance realted to customer satisfaction, a 5-item scale (1=Very weak, 7=*Excellent*) adopted from Gunasekaran (2004) and Chang et al. (2003). The five items used to measure NFP are: waiting time (length of time needed before being served), level of customer-perceived value of the service, level of service systems to meet particular customer needs, staff knowledge to respond to customers request, and safety and protection of customer transactions.

Items and	•	Factor loading		Standard	t- value	Internal	
Underlying Factors			-		Error		Consistency (α)
Factor 1: Strategic	1	SP1	.66	\checkmark	.08	8.28	.87
Purchasing (SP)	2	SP2	.66	\checkmark	.05	11.27	
	3	SP4	.63	\checkmark	.11	5.69	
	4	SP7	.62	\checkmark	.06	9.39	
	5	SP8	.60	\checkmark	.05	10.31	
	6	SP6	.60	\checkmark	.06	11.69	
	7	SP9	.45	х	-	-	
	8	SP3	.43	х	-	-	
	9	SP10	0	х	-	-	
	10	SP5	0	х	-	-	
Factor 2: Bilateral	1	BC_IS3	.65	\checkmark	.06	9.71	.90
Communications	2	BC_IS2	.61	\checkmark	.05	11.30	
& Information	3	BC_IS4	.59	\checkmark	.07	7.58	
Sharing (BC_IS)	4	BC_IS6	.58	\checkmark	.09	5.98	
	5	BC_IS1	.52	\checkmark	.06	8.75	
	6	BC_IS5	0	х	-	-	
	7	BC_IS7	0	х	-	-	
Factor 3: Supplier	1	SR_I4	.67	\checkmark	.08	8.25	.85
Relationships &	2	SR_I1	.65	\checkmark	.06	9.54	
involvement (SR_I)	3	SR_I6	.65	\checkmark	.06	10.76	
	4	SR_I7	.65	\checkmark	.05	12.45	
	5	SR_I3	.65	\checkmark	.10	6.43	
	6	SR_I2	.64	\checkmark	.08	7.78	
	7	SR_I5	.64	\checkmark	.10	5.99	
	8	SR_I8	.31	х	-	-	
	9	SR_19	.34	х	-	-	
Factor 4: Number	1	NP_LT5	.68	\checkmark	.08	8.09	.71
of Supply Chain	2	NP_LT1	.64	\checkmark	.06	9.65	
Partners and Level	3	NP_LT4	.59	\checkmark	.10	5.87	
of Trust (NP_LT)	4	NP_LT2	.53	\checkmark	.07	6.82	
	5	NP_LT3	.52	\checkmark	.07	7.23	
Factor 5: Financial	1	FP1	.73	\checkmark	.10	6.98	.82
Performance (FP)	2	FP2	.63	\checkmark	.11	5.35	
	3	FP3	.51	\checkmark	.07	6.82	
Factor 6: Non-	1	NFP4	.69	\checkmark	.06	10.34	.71
Financial	2	NFP5	.63	\checkmark	.11	5.72	
Performance (NFP)	3	NFP2	.59	\checkmark	.10	5.98	
. ,	4	NFP1	.57	\checkmark	.06	8.92	
	5	NFP3	.53	\checkmark	.08	6.57	

Table 1. Factor Loading, Standard Error, t-value and Internal consistency (α)

Data Collection

The sample was drawn from the Purchasing Manager Classified Business Directory (PMCBD) member list on a cross-industry basis. The range of industries covered in the sample included high uncertainty business environments (computers, furniture, autos, garments, etc.) as well as more stable businesses such as transportation machinery and medical supplies. The PMCBD general member list was further screened to select only executive-level purchasing professionals at the Senior Manager or Vice-Presidential level. Studies have shown that high-ranking respondents tend to be more reliable sources of information than their subordinates (Philips 1981). A self-administrated survey instrument was delivered to the selected 1,200 companies along with a cover letter and prepaid return envelope. To maintain anonymity, the questionnaire asked no personal information, other than the position of the respondent in the company. The cover letter briefly explained the objective of the study and the researcher gave assurance that the responses will be kept strictly confidential. The survey was delivered to the senior management (CEO/President/Chairman, and Vice President) of the manufacturing companies that are located in the UAE region. In this study, the size of a company is measured by the number of employees. Overall, we received 356 useful responses, out of which 212 responses (59.5 percent) were from small-sized companies, 130 responses (36.5 percent) from medium-sized companies, and 14 responses (3.9 percent) from large-sized companies. Therefore, the responses from large-sized companies were excluded in data analysis. Consequently, the analysis is based a sample size of 342 companies. More than 52% of the responses (180 out of 342 were filled by the manager of the participating companies).

Non-Response Bias

Armstrong and Overton (1977) have suggested considering the responses of late respondents as nonrespondents to determine the non-response bias. In this research study, 75 surveys were randomly selected from the first and last wave of completed surveys received. The mean strategic purchasing score of the first 75 surveys was 2.54 whereas it was 2.25 for the last 75 surveys. The t-test results comparing the two groups revealed no statistically significant differences across them for any of the variables studied in this research. The t-test does not completely rule out the existence of non-response bias (Krause et al. 1998). Therefore, the chi-square test was conducted by comparing the size of the companies of those that responded and those that did not respond. The results confirmed that there is no difference in terms of size of the companies that responded and those that did not respond, which indicates that non-response is not an issue in this study.

Data Analysis

In order to test the construct validity of the variables in the study, an EFA was conducted using principal components and varimax rotation. Table 1 reports each extracted factor with corresponding loadings (\geq 0.5). All factor loadings indicate that the measurement variables had a high loading value in their corresponding variable and a low loading value in the other factors. The research model presented in Figure 1 was tested using the SEM LISREL 8.50. It is a multivariate analysis methodology for empirically examining sets of relationships represented in the form of linear causal models (Bollen & Long 1993, Joreskog & Sorbom 2001). Structural equation is an appropriate statistical technique for testing a model that is hypothesized a priori and which assesses the relationships among latent constructs that are measured by multiple scale items where at least one construct is both a dependent and an independent variable (Hair et al. 1995). Mathematically, the SEM decomposes the empirical correlations or co-variances among the measured variables to estimate the path coefficients in the path diagram. Before testing the research model, it is important to check the model identification to obtain the correct estimate of the parameter values. It is important to calculate the number of parameters to be estimated by the model and the observed variables. The calculation shows that the strategic purchasing structural model is overidentified. With 31 observed variables, there are (31*32)/2=496 observations. The number of parameters

to be estimated is 73, including the variances of 31 variables (6 exogenous and 25 indigenous variables that are the disturbance), 31 direct loading on each latent variable, and a total of 11 direct effects. Thus, the model degrees of freedom are 496-73=423 (see Figure 2, df=423). Since the number of observations is greater than the number of parameters to be estimated, we conclude that the strategic purchasing structural model is over-identified and can be tested statistically.



Figure 2. The Strategic Purchasing Structural Model

SP Structural Model Goodness of Fit

Over-identified structural models with more observations than parameters to be estimated usually do not fit the data perfectly (Kline 2004). Therefore, there is a need to measure the degree of fit of such models. The model presented in Figure. 2 shows a good fit of SP, SCM capabilities, and performance to the empirical data. The overall fit of the structural model was assessed with the same set of multiple fit indexes as those of the measurement models with the following results: the observed chi-square was χ^2 =825.15 and the degree of freedom df=423. The goodness-of-fit Indices—the NFI, the NNFI, CFI, and others—obtained by the LISREL program are presented in Table 2.

Table 2. Goodness-	-of-Fit Statistics for	Strategic Purchasin	g Structural Model

Measures	Cutoff Value	Actual
Root Mean Square Error Approximation RMSEA	<.08	.04
Goodness of Fit Index GFI	>.90	.99
Adjusted Goodness-of-Fit Index AGFI	>.80	.91
Normed Fit Index NFI	>.90	.98
Non-Normed Fit Index NNFI	>.90	.99
Comparative Fit Index CFI	>.90	.99

Results

The first group of hypothesis deals with the relationships between the SP and supply chain capability dimensions. To test hypotheses H1, H2, and H3, the regression results and the standardized path coefficients representing the direct effects of SP on supply chain capabilities (BC_IS, SR_I, and NP_LT) are shown in Table 3. The results from the regression analysis indicated that all three hypotheses were supported. All of the correlations were significant at different levels and were in the predicted direction. Hypothesis H1, which dealt with the relationship between SP and bilateral communication and information sharing, was tested using the results from the strategic purchasing path model (Table 3, Figure 2). The path coefficient for SP and BC_IS was .59 (p<.01), indicating that SP has a positive impact on BC_IS. The path coefficients for the other remaining two hypotheses were found to have positive impacts on SR_I (.46, p<.01) and NP_LT (.36, p<.01). The second group of hypotheses deals with the relationships between supply chain capability dimensions and supply chain performance. To test hypotheses H4a, H4b, H5a, H5b, H6a, and H6b, the regression results and the standardized path coefficients representing the direct effects of supply chain capability dimensions on supply chain performance (FP and NFP) are shown in Table 4. The results from the regression analysis indicated that all the six hypotheses were positively and significantly supported in the predicted directions.

Table 5. Direct Encets of Strategie r archasing on Supply chain capability Dimension					
	Sup				
	BC_IS (H1)	SR_I (H2)	NP_LT (H3)		
Strategic	.59***	.46**	.36***	Path coefficient	
Purchasing SP	.16	.18	.06	Standard Error	
	3.57	2.50	5.45	t-Statistics	

Table 3. Direct I	Effects of Strategic	Purchasing o	n Supply Chain	Capability	Dimensions

*** (p<.01). ** (p<.05). * (p<.10). N=342

Hypotheses H4a and H4b, which dealt with the relationship between BC_IS and FP and NFP, were tested using the results from the strategic purchasing path model. The path coefficient for BC_IS and FP was .43 (p<.01) indicating that BC_IS has a positive impact on FP. The path coefficient for the BC_IS and NFP was .28 (p<.01).

	Supply Chair		
	Financial	Non-Financial	
	Performance (FP)	Performance (NFP)	
Supply Chain Capabilities			
Bilateral Communications	.43***	.28**	Path coefficient
& Information Sharing	.16	.10	Standard Error
(BC_IS) (H4a and H4b)	2.60	2.80	t-Statistics
Supplier Relationships &	.50***	.23***	Path coefficient
Involvement (SR_I) (H5a	.18	.07	Standard Error
and H5b)	2.77	3.28	t-Statistics
Number of Partners and	.30*	.31***	Path coefficient
Level of Trust (NP_LT)	.16	.08	Standard Error
(H6a and H6b)	1.80	3.78	t-Statistics

 Table 4. Direct Effects of Supply Chain Capability Dimensions on Performance

*** (p<.01). ** (p<.05). * (p<.10). N=342

Hypotheses H5a and H5b, which dealt with the relationship between supplier relationships and involvement and supply chain FP and NFP, were tested using the results from the strategic purchasing path model. The path coefficient for SR_I and FP (.50, p<.01) indicates that SR_I has a positive impact on FP. The path coefficient for the SR_I and NFP was .23 (p<.01). Hypotheses H6a and H6b, which dealt with the relationships between the number of supply chain partners and the level of trust and supply chain FP and NFP, were tested using the results from the strategic purchasing path model (Table 4, Figure 2). The path coefficient for NP_LT and FP was .30 (p<.01), and for NP_LT and NFP was .31 (p<.01).

To test H7a and H7b, the regression results and the standardized path coefficients representing the direct relationship between SP and performance are shown in Table 5. Our tests on Hypothesis H7a provide support for the existing theory on the relationship between SP and performance. The path coefficient for SP was .35 which has a significant (p<.01) positive relationship with FP. On the other hand, the path coefficient (.20) for SP has relatively less significant (p<.05) relationship with FP. SP has achieved high rates on FP and lower rates on NFP. SP has an impact on FP.

Table 5. Direct Effects	of Strategic Purchasing	on Performance
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	Supply Cha		
	Financial Performance		
	(FP) (H7a)	(NFP) (H7b)	
Strategic	.35***	.20**	Path coefficient
Purchasing SP	.10	.10	Standard Error
	3.43	2.00	t-Statistics

*** (p<.01). ** (p<.05). * (p<.10). N=342

Discussion and Implication for Managers

Purchasing has a strategic role in SCM. This is relevant in the context of a developing country such as UAE in which organizations operate in a challenging economic and sociocultural environment. In our study, strategic purchasing was linked to three supply chain capabilities in terms of bilateral communications and information sharing, supplier relationships and involvement, number of partners and level of trust and organization financial performance and organization non-financial performance.

The significant effect of SP on BC_IS suggests that purchasing managers in emerging markets such as UAE realize the importance of two-way communication in enhancing trust, cooperation, and the importance of sharing information. BC_IS is vital as it is the foundation upon which ideas and processes are being implemented. An understanding of these information sharing enablers helps organizations capitalize on them and positively influence their performance capability. This implies that timely exchange of information through effective communication will improve the performance of organizations.

The role of SR_I in the success of businesses cannot be ignored. The early involvement of suppliers is an essential ingredient to support through the initial phases of product design contributions, quality considerations, and technology suggestions. Purchasing managers in emerging markets are aware of the importance of building good relations with their suppliers. In the past, organizations regarded their suppliers as adversaries and dealt with them on the basis of prices. However, the positive relationships indicated that purchasing managers appreciate strategic cooperation and supplier involvement. Our study supports the view that firms that focus on strategic supplier relationships and involvement achieve greater long-term benefits from their efforts than firms adopting the non-strategic approach (Krause et al. 1998). Therefore, long-term value creation is one of the main organizational objectives of businesses, and SP and SR_I lead to improved performance in the buying firm (customer). Therefore, managers should understand the SP and supplier relationships and involvement and how they are related. Good supplier relations provide benefits such as supplier flexibility in terms of accepting changes in delivery schedules, quality, and quantities.

In the case of the number of partners and the level of trust (NP_LT), the positive association between SP and NP_LT implies that purchasing managers recognize the importance of building an effective supply base to the success of their organizations. One possible explanation for this recognition is that some organizations in emerging markets such as UAE may only be able to source and procure supplies from certain suppliers who have the necessary expertise or access to resources or quality of goods demanded by the buying organization. For example, purchasing minerals is determined by geographical endowments, and organizations that have rights to those deposits are the only organizations a buyer may deal with. SP involves the highest level of strength of relationship within which the supply chain partners integrate their major consumer processes to achieve their common, desired goals based upon mutual trust (Claro et al. 2006, Spekman et al. 1999).

Further, the positive impact of SP on the number of partners and level of trust can be realized in the UAE context. For example, supply may permit the purchasing department to spread risk by expanding its supply base. Therefore, dealing with large number of the supplier's base does not necessarily mean having more suppliers. It may mean fewer but better quality suppliers. Better collaboration may be achieved by broadening the supply base. The trend in a supply chain is to have fewer suppliers and to build better relationships with those suppliers and maintain a high level of trust. For example, many retailers in the UK have reduced the numbers of suppliers. Bookstores have reduced the numbers of publishers. The relationship between SP and performance has been researched from the resource-based and supply chain perspectives. For instance, Carr and Smeltzer (1997) reported the positive effect of SP on performance. The findings of our study support the notion of the positive association between SP and performance that is frequently cited in the literature, although it appears that SP has higher impact on FP than NFP. Supply chains managers need to develop SP to achieve NFP. Positive but moderate of SP and supply chain capabilities with NFP shows that there is a room to better leverage the SP approach for achieving NFP at the inter-supply chain level in UAE. Further, there is possibility to better employ the SP and supply chain capabilities to achieve NFP which could be a source of competitive advantage in terms of high performance achievement. Although, there is no specific explanations in the literature related to the moderate relationship between SP and NFP, it may be that managers in emerging markets may not realize the importance of NFP in the same proportion as they perceive FP. The moderating relationship could be due to cultural issues and style of leadership in the country. Nevertheless, the positive relationship implies that purchasing managers recognize the importance of considering both FP and NFP. The findings of our study show that SP should get more attentions from the supply chain managers in emerging markets, which will in turn improve both FP and NFP.

Direction for Further Research

Further research can be carried out to extend our research model and explore the measures of strategic purchasing, supply chain capabilities, and performance, and incorporate other supply chain capability constructs that were not included in this research such as agility, flexibility, cooperation, and joint knowledge and learning in the research model. Environmental uncertainty and competition pressure may moderate the contribution of supply chain capabilities. Therefore, it may be beneficial to examine the moderation effects of environmental uncertainty and competition pressure in dynamic environments and provide insights for organizations to manage supply chains in competitive environments.

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