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Supply chain management practices and firms' operational performance

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Abstract

Purpose – The purpose of this paper is to provide an empirical evidence about the relationship between practices of supply chain management (SCM) and operational performance (OP).

Design/methodology/approach – Based on a comprehensive literature review, a set of SCM practices has been identified and selected to develop a conceptual model as well as to establish their relationship to companies' OP. The measurement scales of the practices were developed in four steps: identification and development of initial instrument; personal interviews and Q-sort; large-scale data collection; and large-scale analysis in order to ensure unidimensionality, reliability and validity. Structural equation modeling was used to validate the model with the data were collected in Vietnamese garment enterprises.

Findings – The study consolidated relationships between the SCM practices and OP. According to the research results, these practices have a “resonant” influence on OP that can explain 52.6 percent variance of this output concept. In particular, customer focus and supplier management both direct and indirect impact on OP while top management support and process control/improvement only have indirect and direct influences on OP, respectively.

Research limitations/implications – There are some limitations that can guide academics to new lines of future research: to extend the scope of the survey to include different countries and new situations, so results can be generalized; to consider the impacts of the SCM practices on the entire supply chain performance; and to explore additional factors that can further explain OP, such as operational environment, capital, technology, human resource, etc.

Practical implications – The authors suggest that the SCM practices should be implemented as an integrated system rather than independent practices, in which they interact with each other and improve OP.

Originality/value – The empirical results of this study provide an evidence to consider the SCM practices as reliable predictors for OP. According to the research, these practices interact with each other and have both direct and indirect effects on OP. In other words, through the mutual interaction among the SCM practices,

they have the “resonant” influence on improving OP. Moreover, the proposed research model analyzing the relationship among SCM practices and OP and its validation using the Vietnam garment industry provided valuable insights both from theoretical and practical perspectives.

Keywords Vietnam, Garment industry, Operational performance, Supply chain management, Supply chain management practices

Paper type Research paper

1. Introduction

There are many worldwide researchers conducting studies to develop efficient methods to improve operational performance (OP). As competition move from organizations to supply chains, the term of supply chain management (SCM) has become popular. The implementation of SCM practices is considered as a base for improvement of OP (Li *et al.*, 2005).

The relationship between SCM practices and OP has been receiving much attention in the literature (Christopher, 2013). However, the results have not been fully consistent. For instance, in the relationship between process management and performance, the direct effect of process management on performance has been identified in several studies (Kaynak, 2003; Kaynak and Hartley, 2008; Sila and Ebrahimpour, 2005; Prajogo and Brown, 2004; Terziovski, 2006; Feng *et al.*, 2006; Fening *et al.*, 2008; Zu, 2009). However, according to Tari *et al.* (2007), they have an indirect relationship (Tari *et al.*, 2007). Conversely, Flynn *et al.* (1995) argued that process management has a negative direct relationship with performance, or even they are not associated (Powell, 1995; Samson and Terziovski, 1999).

Likewise, it is unclear in the relation of top management support to performance. Many authors stated that top management support positively and directly impacts on performance (Dow *et al.*, 1999; Samson and Terziovski, 1999; Rahman and Bullock, 2005; Sila and Ebrahimpour, 2005; Fening *et al.*, 2008). In our opinion, this statement does not precisely reflect the role of top management support that offers policies, necessary resources and creates a supporting environment for the implementation of other practices. Thus, it cannot directly impact on performance. Powell (1995) indicated that top management support has a relationship with performance. However, he has not shown clearly “the mechanism/the nature” of this relationship.

According to Kaynak (2003), furthermore, if a research model does not explore the relationships among practices, it cannot be considered comprehensively. In other words, further researches need to identify the direct and indirect impact of SCM practices on OP at multiple levels. However, by using multiple regression approach (Adam *et al.*, 1997; Samson and Terziovski, 1999; Fening *et al.*, 2008; De Cerio, 2003; Zehir and Sadikoglu, 2010; Flynn *et al.*, 1994) or correlation (Powell, 1995; Tabachnick and Fidell, 2012), this issue cannot be fully addressed.

In sum, there are some research gaps that reduce the value of previous studies in the literature. Those are:

- the inconsistency in results of previous studies;
- the role of top management support;
- the mutual interaction among practices has not been examined; and
- data analysis approach.

This study aim at filling the above voids by proposing a new framework based on structural equation modeling (SEM) technique and validating this model by the data collected from the Vietnam garment industry. This is a sector playing an important role in the Vietnam socio-economic development in terms of creating huge employment, especially jobs for females, contributing as a major source of foreign exchange accumulation for the nation and creating a tremendous integration opportunity for Vietnam in the global economy.

However, after two decades of integration and development, among five main segments, including raw material, garment accessories production, cutting and sewing, exporting and distributing, Vietnam garment industry still mainly focuses on the cutting and sewing stages that are the lowest value-added segments in the value chain.

Most of Vietnamese garment companies, containing service and manufacturing enterprises, are facing competitive disadvantages due to their inherent issues such as high operating costs, high lead-time, high rates of damaged materials, late delivery and decreasing operational efficiency. We also expect that the practical findings achieved from this research could contribute to the development of Vietnam garment industry in particular and to its global economic performance.

The structure of this paper includes six sections. The following one introduces theory background, then research model and hypotheses are proposed. Section 3 describes the development of the measurement instrument. In Section 4, results are presented and discussed. Implications and directions for further research are mentioned at the end of this paper.

2. Theory background and hypotheses

SCM aims at improving the sourcing of raw materials, the production and the distribution of products/services to customers (Hugos, 2011; Fredendall and Hill, 2000). Thus, the successful implementation of SCM practices provides opportunities to improve OP along the supply chain (Harrison and New, 2002).

In the literature, the adoption of SCM practices has been widely conducted. Yet, there has been a large degree of overlap in the use of SCM practices and quality management practices. In other words, the taxonomy between them is unclear.

According to Talib *et al.* (2011), they can be classified based on “primary integration.” While quality management practices mainly concentrate on the internal integration, e.g. executives and employees, SCM practices take into account internal processes of an organization and linking these with the external operations of members in the entire supply chain. Hence, by combining with an extensive literature review, a set of relevant SCM practices has been identified. Their definition is described in Table I. These practices are grouped into two sections:

- (1) core practices are defined as technique- and methodology-oriented practices for supply chain, e.g. supplier management, customers focus, process control and improvement; and

SCM practices	Description
Process control and improvement	Use of fool-proof for process design, statistical techniques, automation, preventive equipment. Clarity of work or process instructions. Identification of problem easily (Kaynak, 2003; Saraph <i>et al.</i> , 1989; Forker, 1997)
Top management support	Offer of innovation and continuous improvement policies. Provision of necessary resources for processes. Promotion of partners' involvement in firm's activities. Participation of top management in supply chain improvement process. Review of supply chain issues in top management meetings. Responsibility for OP (Kaynak, 2003; Saraph <i>et al.</i> , 1989; Flynn <i>et al.</i> , 1995)
Customer focus	Determination of customers' needs and wants. Use of information from customers in designing products and services. Understanding of products or services by employees. Commitment in satisfying customers. Relationship between company's goals and customers' expectations (Lakhal <i>et al.</i> , 2006)
Supplier management	Reliance on a few suppliers. Selection of suppliers based on quality. Development of long-term relationship with suppliers. Clear of the specifications provided to suppliers. Assessment of suppliers' capabilities and performance (Li <i>et al.</i> , 2005)

Table I.
Description of
SCM practices

- (2) support practices are people- and culture-oriented practices that create a supporting environment for effective use of the core SCM ones, e.g. top management support.

This classification that still remains unclear in the literature plays an important role. It can be used as “an orientation” for proposing the relationship among constructs. Based on this classification, our structural equation model is developed as follows.

Figure 1 schematically depicts the mutual interaction among SCM constructs with each arrow representing the relationship between each pair of constructs. This interaction can show the direct and indirect relationship of SCM practices on OP. For instance, the arrows pertaining to the relations of top management support to customer focus, supplier management, process control and improvement indicate the role of the support practice in creating supporting environments for effective use of the core practices. Moreover, these relationships also show that top management support does not directly effect on OP, however, by influencing on other SCM practices, it can indirectly improve OP.

In this study, these relationships will be validated by using SEM, which is an adequate approach to test the direct and indirect effect (Bollen, 1989). Furthermore, we expect that the validation of this model can point out the “resonant” influence of mutual interaction among SCM practices on OP. In the following sections, hypotheses suggested in the research model will be developed.

2.1 Top management support

The support of top management is the main motivation that drives companies toward an effective and successful implementation of SCM (Abraham *et al.*, 1999; Ahire and Dreyfus, 2000; Ahire and O'Shaughnessy, 1998).

In most companies, customer satisfaction is the key driver of all activities. Therefore, customers' needs must be properly addressed by all employees (Lakhal *et al.*, 2006). Top management support is essential to ensure that necessary resources are provided to carry out market studies that are able to determine customers' needs and wants as well as make all efforts to meet them (Kaynak, 2003).

Additionally, in the SCM perspective, customer involvement in the firm's activities plays an important role in the success of the whole supply chain (Robinson and Malhotra, 2005). Top management can promote customer involvement from the early stages of development until the commercialization stage (Flynn *et al.*, 1995). Top management, further to define

Figure 1.
Research model

companies' mission and goals, creates the working environment in which all employees are encouraged to focus on addressing customer requirements (Ahire and Ravichandran, 2001). Thus, we suggest the following hypothesis:

H1a. Top management support is positively related to customer focus.

Top management sets up policies which encourage innovations and continuous improvement in an organization. For instance, in manufacturing activities, top management makes decisions to invest machines, equipment, etc., or to increase levels of automation as well as enhance implementation of preventive equipment maintenance and fool-proof of process design. This minimizes the probability of employee errors and reduces variance in processes (Kaynak, 2003; Saraph *et al.*, 1989; Forker, 1997; Flynn *et al.*, 1995; Sila and Ebrahimpour, 2005; Lakhali *et al.*, 2006). Thus, the following hypothesis is suggested:

H1b. Top management support is positively related to process control and improvement.

As traditional approaches, supplier management is seen as a mere administrative activity that mainly focuses on supplier selection. In this activity, price is the main criterion to evaluate suppliers. This can result in poor quality materials or even delayed orders. In the new perspective, supplier management refers to not only selection of quality suppliers, but development of long-term relationship with suppliers and assessment of suppliers' performance also (Li *et al.*, 2005). These activities only implement successfully if they receive support from top management (Kaynak, 2003; Kaynak and Hartley, 2008; Sila and Ebrahimpour, 2005; Singh, 2008; Zu *et al.*, 2008). Top management actively participates in this process and selection will be made based on reviewing of more demanding criteria, e.g. quality, reliability of delivery activities and service. It ensures that firm has reliable and high-quality suppliers (Flynn *et al.*, 1995; Trent and Monczka, 1999). Moreover, effective supplier management is considered as a strategic area by top managers promoting higher levels of integration and collaboration (e.g. design, production, marketing, sales and customer service) with key suppliers. Thereby, communication, relationship and cooperation among parties in the supply chain are improved (Ellram, 1995). Thus, we propose the following hypothesis:

H1c. Top management support is positively related to supplier management.

2.2 Customer focus

Customer focus is considered a key element for successful enterprises. All activities such as the development of new product/services, production, marketing, distribution and after-sales services should be concentrated on customer requirements. Each department and every employee should share customer-focused vision alike (Ahire and O'Shaughnessy, 1998; Ahire and Ravichandran, 2001; Flynn *et al.*, 1995; Lakhali *et al.*, 2006; Forza and Filippini, 1998; Nair, 2006; Sila and Ebrahimpour, 2005).

The implementation of customer focus practice helps companies to better understand customer expectations and market opportunities (Lakhali *et al.*, 2006). Based on that, firms can be active in planning for purchasing, production, delivery, etc. For instance, firms can balance supply and demand, reducing variance in processes (Lee *et al.*, 1997). In production activities, by understanding customer's demand, a company could coordinate effectively machines, equipment and human resources to minimize process variances, reduce downtime and lead-time. Furthermore, employees knowing the attributes of products/services can minimize errors and suggest improvements. Consequently, the effectiveness of processes and OP are improved. Finally, in the delivery stage, better shipment plans could be devised in order to reduce rates of late deliveries. Moreover, since customer's needs and wants are well identified, companies can focus on value-added activities and be able to eliminate or,

at least reduce, defect rates, scrap, rework, returns, etc. (Rahman and Bullock, 2005; Dow *et al.*, 1999; Lakhal *et al.*, 2006; Samson and Terziovski, 1999; Fening *et al.*, 2008; Zehir and Sadikoglu, 2010). Hence, we suggest the following hypotheses:

H2a. Customer focus is positively related to process control and improvement.

H2b. Customer focus is positively related to OP.

2.3 Supplier management

As referred earlier, cooperation between a company and key suppliers is a basic and critical SCM practice. Buyers collaborate with suppliers to ensure that input materials meet standards and quality requirements in order to produce quality products (Chen and Paulraj, 2004; Li *et al.*, 2005; Robinson and Malhotra, 2005; Vickery *et al.*, 2003; Kaynak, 2003; Kaynak and Hartley, 2008; Ou *et al.*, 2010). High-quality inputs, provided at the right time with the required quantity, helps firm to avoid downtime incidents, to reduce variance in processes and the rate of damaged materials (Flynn *et al.*, 1995; Forza and Filippini, 1998). Moreover, effective supplier management can cut off inventory, waste and safety inventory level (Easton and Jarrell, 1998; Yeung, 2008).

From a supply chain perspective, suppliers are involved in the firm's activities (Robinson and Malhotra, 2005). They can suggest the most appropriated components or parts for designing new products (Hoegl and Wagner, 2005), and help purchasers buying inputs that can be used most efficiently in manufacturing processes (Flynn *et al.*, 1995; Forza and Filippini, 1998; Shin *et al.*, 2000; Tan, 2001; Trent and Monczka, 1999). In addition, Vonderembse and Tracey (1999) showed that a good relationship with suppliers is useful for reducing order-time and rate of late orders. Hence, we suggest the following hypotheses:

H3a. Supplier management is positively related to process control and improvement.

H3b. Supplier management is positively related to OP.

2.4 Process control and improvement

Process control and improvement refers the use of statistical techniques, increasing automatic level of processes and fool-proof in designing process (Kaynak, 2003; Saraph *et al.*, 1989; Forker, 1997; Flynn *et al.*, 1995). These activities are helpful in decreasing process variance (Flynn *et al.*, 1995) and minimizing chances of employee errors (Kaynak, 2003; Saraph *et al.*, 1989; Forker, 1997). As a consequence, rate of damaged materials and late delivery, lead-time, unnecessary costs are reduced (Ahire and Dreyfus, 2000; Anderson *et al.*, 1995), output increases and uniformity of products is higher (Anderson *et al.*, 1994; Forza and Filippini, 1998). Furthermore, the use of preventive equipment maintenance makes manufacturing process smoothly by improving reliability of equipment and restricting disruption in production (Ho *et al.*, 1999). The relation of process control and improvement to OP is founded in the studies of Ahire and Dreyfus (2000) and Forza and Filippini (1998). Hence, the following hypothesis is proposed:

H4. Process control and improvement is positively related to OP.

2.5 OP

OP refers to the ability of a company in reducing management costs, order-time, lead-time, improving the effectiveness of using raw material and distribution capacity (Heizer *et al.*, 2008). OP has an important meaning to firms, it helps to improve effectiveness of production activities and to create high-quality products (Kaynak, 2003), leading to increased revenue and profit for companies.

3. Research methodology

This section describes the validation methodology of the conceptual model, including: identification and development of initial instrument, personal interviews and Q-sort, large-scale data collection and large-scale analysis.

3.1 Identify and develop the initial instrument

Based on a comprehensive literature review and definition of SCM practices in Table I, the scales of constructs were developed (Table II). A seven-point Likert scale was employed with a score of 1, indicating “strongly disagree” and 7, representing “strongly agree,” to extract the different attitudes of respondents.

3.2 Personal interview and Q-sort

A structured interview of academicians with experience in the SCM area was conducted. These discussions were recorded, analyzed before to perform some improvements in the model. Q-sort method, then, was applied with the participation of some managers to assess initial construct validity, reliability and unidimensionality.

In the process of Q-sort method, some managers, who are working in the garment industry, were invited to review the scales of constructs in order to improve their overall quality. Based on the feedback from experts, items were adjusted, and then, the official questionnaire was established.

3.3 Large-scale data collection

Target population in this study is Vietnam-based garment companies. The target respondents include presidents, vice presidents, directors, managers and coordinators who have information and experience in SCM. In the list of General Statistics Office in 2008, there are 3,174 garment enterprises. Contact information of companies was searched from the website of nhungtrangvang.com.vn, which provides address, e-mail, phone, etc., of companies in Vietnam. A total of 2,147 out of 3,147 garment enterprises were selected. The link of the official questionnaire was sent to these 2,147 firms via e-mail addresses. In order to increase the response rate, an electrical postcard was sent after the initial mailing to remind non-respondents. Depending on their requirements, a copy of the questionnaire was mailed by post office or the link of the survey was sent to their e-mail. One month later, the survey link, once again, was e-mailed. To encourage the cooperation of respondents, the survey results would be sent to them. A total of 246 questionnaires was received, resulting in the response rate of 11.5 percent. This is a significant rate with the method of e-mail survey (Tse *et al.*, 1995).

An estimate of non-response bias with *t*-test procedures was conducted in order to test the difference in items between early and late respondents (Armstrong and Overton, 1977). Results showed that no significant differences in the average scores of all observed items were found (internal confidence of 99 percent). It means that non-response bias exists between early and late respondents.

These 246 questionnaires were checked before analyzing in order to reduce errors in the data entry process and detect missing values. After filtering data, there were 179 valid questionnaires, which were used for the next steps.

In addition, independent and dependent variables were obtained from the same respondent in each firm. This could lead to the presence of common method variance (CMV). Harman's single-factor test was calculated to test this existence (Podsakoff *et al.*, 2003). Unrotated factor analysis was performed with all observed items. If only one factor emerges, in other words, if a general factor could explain most of covariance in all variables, it is rational to conclude that a significant CMV is existed. Results indicated that eight factors

Constructs	Observed items	Cronbach's α and EFA with SPSS				CFA with AMOS			
		Factor loadings	Item-total correlation	Eigenvalue	Variance extracted	Cronbach's α	Standardized regression weights	Composite reliability	Variance extracted
Process control and improvement	Use of statistical techniques	0.803	0.647	2.721	68.014	0.843	0.708	0.844	0.575
	Use of automatic processes	0.847	0.710				0.798		
	Use of fool-proof for process design		Deleted				Deleted		
	Use of the preventive equipment maintenance	0.803	0.649				0.727		
Top management support	Clarity of work or process instructions	0.845	0.706				0.796		
	Offer of innovation and continuous improvement policies	0.761	0.640	3.429	57.142	0.85	0.739	0.809	0.514
	Provision of necessary resources for processes	0.800	0.686				0.726		
	Promotion of partners' involvement in firm's activities	0.761	0.639				0.693		
Customer focus	Participation of top management in supply chain improvement process	0.749	0.625				0.708		
	Review of supply chain issues in top management meetings	0.740	0.615				Deleted		
	Responsibility for OP	0.722	0.593				Deleted		
	Determination of customers' needs and wants	0.802	0.623	2.461	61.517	0.791	0.75	0.751	0.502
	Use of information from customers in designing products and services	0.771	0.583				0.681		
	Understanding of products or services by employees	0.798	0.617				0.692		
	Commitment in satisfying customers and customers' expectations	0.766	0.578				Deleted		
		Deleted				Deleted			

(continued)

(continued)

Table II.
Test results of
measurement
instrument

Table II.

Constructs	Observed items	Factor loadings	Cronbach's α and EFA with SPSS			CFA with AMOS			
			Item-total correlation	Eigenvalue	Variance extracted	Cronbach's α	Standardized regression weights	Composite reliability	Variance extracted
Supplier management	Reliance on a few suppliers	0.839	0.740	3.502	70.039	0.893	0.802	0.893	0.608
	Selection of suppliers based on quality	0.822	0.717				0.774		
	Development of long-term relationship with suppliers	0.826	0.723				0.765		
	Clear of the specifications provided to suppliers	0.826	0.723				0.777		
Operational performance	Assessment of suppliers' capabilities and performance	0.871	0.784				0.837		
	Reduction of management costs	0.768	0.626	3.08	61.594	0.844	0.656	0.868	0.517
	Reduction of lead-time	0.780	0.643				0.670		
	Reduction of order-time	0.793	0.661				0.764		
	Reduction of rate of damaged materials	0.827	0.705				0.779		
	Reduction of rate of late delivery	0.754	0.612				0.697		

were appeared, however, when the number of items are too much, this way of testing is not really exact (Podsakoff *et al.*, 2003). Therefore, in this case, items in each of the independent construct (SCM practices) were factor analyzed with items in the dependent construct's scale (OP). For each case, the results of factor analysis showed that two and more than two factors were emerged, meaning that there is no significant CMV.

Most of the respondents are presidents, directors, vice directors, managers, etc., who had more than five years of working experience in the current company. Among them, 32.4 percent are retailers, 40.2 percent of manufacturing companies, 14.5 percent of distribution centers, fabric firms account 10.6 percent and the remaining are design-related companies. Approximately 35.8 percent of the firms employed between ten and 49 workers, 26.8 percent of the firms had ten or fewer employees, 19.6 percent of the firms had 50-249 employees and 17.8 percent of the firms had more than 250 employees.

3.4 Large-scale data analysis process

First, Cronbach's α coefficient was used for evaluating reliability of each construct (Antony *et al.*, 2002). Cronbach's α coefficient is a statistical test about the consistent degree to which observed items in a construct are correlated. Additionally, to improve Cronbach's α coefficient, items which are low in item-total correlation coefficient will be deleted. Coefficient of item-total correlation expresses the correlation among an item and the average score of other items in the same construct. Thus, the higher this coefficient is, the higher the correlation among items are and reliability of this construct is high in the result (Hair *et al.*, 1995; Nunnally, 2010).

Then, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to assess unidimensionality and validity of constructs, including convergent validity, discriminant validity and criterion-related validity.

Additionally, in the data set of this research, the distribution of observed items is the normal distribution. Most of Kurtosis and Skewness range from (-1, +1), which is in the acceptant range (Kline, 1998). Thereby, the method of maximum likelihood is appropriate to estimate the parameters in the research models (Muthen and Kaplan, 1985).

If measurement items are unidimensional, reliable and valid, the analysis of structural equation model is carried out to test the hypotheses developed in the research model. In contrast, the process will turn back to literature review to redefine the constructs as well as the measurement instrument. The results of validating hypotheses can show direct and indirect effects of the SCM practices on OP. Furthermore, in order to test the "resonant" influence of mutual interaction among the SCM practices on OP, a competitive model that only exists direct effects of SCM practices on OP and has no mutual interaction among SCM practices was built. It will be compared with the SEM model. The one that has the goodness of fit statistics and R^2 for OP explained by the SCM practices greater, is a better model. In case, the better one is the SEM model, it means that the mutual interaction among SCM practices has a "resonant" impact on OP and vice versa.

4. Results

4.1 Test results of the measurement instrument

The measurement items were calculated Cronbach's α and EFA with the support of statistical package for the social sciences in advance. Extraction method used in EFA was principal component - rotation method of varimax. The breakpoint is at eigenvalue ≥ 1 for all constructs in theory model. The results, in Table II, indicated that two items were deleted because they do not get the target value. The remaining items have the coefficient of item-total correlation range from 0.578 to 0.784 (greater than 0.35), the minimum of Cronbach's α is 0.791 (greater than 0.7), factor loadings range from 0.722 to 0.871 (greater than 0.4), eigenvalue is greater than 1, the average variance extracted is greater than 50.

Then, CFA was carried out by AMOS software. After removing three items which do not get the target values, the measurement model including four constructs of SCM was tested with the following results: $\chi^2/\text{df} = 0.927$ (less than 3.0), root mean square error of approximation (RMSEA) = 0.000 (less than 0.08), Akaike's information criterion (CAIC) = 320.734 < CAIC for saturated model (841.484) and CAIC for independent model (1,452.991), parsimony goodness of fit index (PGFI) = 0.686 (greater than 0.5), parsimony normed fit index (PNFI) = 0.769 (greater than 0.5), comparative fit index (CFI) = 1.000 (greater than 0.9), indicating that the measurement model is appropriate with the collected data (Bollen, 1989; Byrne, 1998; Carmines and Mciver, 1981; Hair *et al.*, 1995; Jaccard and Wan, 1996; Joreskog and Sorbom, 1993).

For the dependent construct, $\chi^2 = 6.977$, $p = 0.222$ (> 0.05); $\text{df} = 5$; $\chi^2/\text{df} = 1.395$ (< 3.0); GFI = 0.985, TLI = 0.988, CFI = 0.994 (> 0.9); RMSEA = 0.047 (< 0.08), CAIC = 68.723 < CAIC for saturated model (92.811) and CAIC for independent model (369.104), indicating that the measurement model of the dependent construct is appropriate with the collected data.

Standardized regression weights of all items are greater than 0.6 (the minimum value is 0.656) and significant ($p < 0.05$). The composite reliability of all items ranges from 0.751 to 0.893, greater than the acceptable level of 0.6 and the average variance extracted ranges from 50.2 to 60.8 percent (> 50 percent) (Table II). In addition, the correlation coefficient between pairs of constructs ranges from 0.471 to 0.632 in the significant level of $p = 0.000$ (Table III). In other words, constructs have discriminant validity (Steenkamp and Van Trijp, 1991). Likewise, each SCM practice has high and positively related to OP, indicating that constructs have criterion-related validity (Li *et al.*, 2005; Kaynak, 2003; Chen and Paulraj, 2004). It is concluded that the scales of constructs have unidimensionality, reliability and validity (Bollen, 1989; Byrne, 1998; Carmines and Mciver, 1981; Hair *et al.*, 1995; Jaccard and Wan, 1996; Joreskog and Sorbom, 1993).

4.2 Test results of hypotheses

The theoretical model was tested by the method of SEM with the support of AMOS 5.0 software (Byrne, 1998). Test results of the structural model showed that $\chi^2/\text{df} = 1.072$ (< 3.0), RMSEA = 0.020 (< 0.08), CAIC = 498.249 < CAIC for saturated model (1,429.286) and CAIC for independent model (1,994.011), PGFI = 0.719 (greater than 0.5), PNFI = 0.776 (greater than 0.5), CFI = 0.992 (greater than 0.9), indicating that the structural model is an appropriate fit with the collected data.

Figure 2 describes the SEM results of relationships among SCM practices and OP. Parameters on the arrows are standardized regression weights (β) and p -value. The test results indicated that all of the paths in the model are supported by the collected data (β ranges from 0.193 to 0.520 at the significant level, $p < 0.025$). In other words, all hypotheses suggested in this study are approved. Moreover, the R^2 for OP explained by the SCM practices is 0.526, indicating that the SCM practices can explain a large amount of variance in OP. Therefore, it can be said that SCM practices suggested in this study have important role in improving OP.

Table III.
Test results of
correlation among
constructs

	1	2	3	4	5
1. Customer focus	1				
2. Supplier management	0.512	1			
3. Top management support	0.480	0.471	1		
4. Process control and improvement	0.563	0.569	0.549	1	
5. Operational performance	0.632	0.523	0.476	0.619	1

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Figure 2.
Test results of the
SEM model

The coefficients of standardized regression weights (β) on the SEM model show direct impacts, there are no information about indirect effects among constructs. In other words, the total effects or the “real” effects have not been indicated yet.

Table IV presents the direct and indirect relationship between pairs of constructs. The column of standardized total effects is the sum of direct and indirect effects. According to the research results, customer focus and supplier management both direct and indirect impact on OP while top management support and process control/improvement only have indirect and direct influences on OP, respectively. Moreover, the test result in Table IV also specifies that although the direct effect of top management support on OP is not found, top management support has the highest effect on the dependent concept in terms of total effect.

Figure 3 schematically depicts test results of the competitive model that has no mutual interaction among SCM practices. The estimation of this model yields an overall χ^2_{186} value of 337.540, a CFI of 0.908 and a RMSEA of 0.068. By comparing the values of these parameters between two models, it can be said that the SEM model is well-fitting to the data than the competitive one. Moreover, the R^2 for OP explained by the SCM practices in the competitive model is 0.393 that is less than in the SEM model (0.526). It means that mutual interaction among SCM practices increases the impact of these practices on OP. In other words, this interaction brings a “resonant” influence of SCM practices on OP.

	Standardized indirect effects	Standardized direct effects	Standardized total effects
TMS→CF	0	0.52	0.52
TMS→SM	0	0.503	0.503
TMS→PCI	0.304	0.273	0.577
TMS→OP	0.487	0	0.487
CF→PCI	0	0.275	0.275
CF→OP	0.092	0.377	0.47
SM→PCI	0	0.319	0.319
SM→OP	0.107	0.193	0.3
PCI→OP	0	0.336	0.336

Table IV.
Test results of
relationship among
constructs

Notes: $\chi^2=337.540$; $df=186$; $\chi^2/df=1.815$; GFI=0.837, TLI=0.897, CFI=0.908; RMSEA=0.068. * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Figure 3.
Test results of the
competitive model

In the competitive model, furthermore, the direct effect of top management support on OP is not found ($p > 0.1$). However, by interacting with the other SCM practices, it has an indirect impact on OP in the SEM model. This result confirmed our statement about the role of the top management support practice. In summary, the empirical evidences in this study can prove the importance of mutual interaction among SCM practices that can show indirect effects as well as bring the “resonant” influence of the SCM practices on OP.

5. Discussion

The empirical results of this study provide an evidence to consider the SCM practices as reliable predictors for OP. According to the research, these practices interact with each other and have both direct and indirect effects on OP. In other words, through the mutual interaction among the SCM practices, they have the “resonant” influence on improving OP. The relationships among the research constructs are discussed as follows.

First, the practice of customer focus is directly related to OP and indirectly through the relationship with process control and improvement. Customers are those who bring benefits/decide the survival and prosperity of firms. Hence, they are an important factor that any firms and supply chains want to find out and satisfy their requirements. The successful implementation of customer focus practice helps companies to better understand customer expectations and market opportunities that firms can balance supply and demand, coordinate effectively machines, equipment and human resources to minimize process variances and increase OP.

Additionally, the relation of top management support to customer focus indicated that customer focus is a mediating factor in the relationship between top management support and OP. In particular, top management creates the organizational culture and provides necessary resources to determine the customer demands that will result in increasing OP.

Second, the practice of supplier management is both directly related to OP and indirectly through the relationship with process control and improvement. Nowadays, buying quality materials at a reasonable price becomes more and more difficult. To increase the effectiveness of purchasing, supplier management plays an extremely important role (Yeung, 2008; Easton and Jarrell, 1998). Different from the traditional view, many suppliers are chosen to have the cheapest price. Supplier management practice relies on a few suppliers and develops the long-term relationship with them. As a result, firm will have the stable supply, reduce the variance in price and processes as well as improve OP.

The study also confirms the relation of top management support to supplier management. It means that supplier management is a mediating factor in the relationship between top management support and OP. By selecting qualified suppliers and providing the best conditions for them to participate in daily activities, top management helps to increase efficiency of supplier management that will result in improving OP.

The direct impact of process control and improvement on OP is also supported in this study. When an organization can control and improve its processes effectively, it can ensure that manufacturing processes operate smoothly. Process variance and chances of employee errors, therefore, are also minimized. Consequently, OP is improved.

This study, once again, proved role of the support SCM practice – top management support. Although there is no direct relationship with OP, among the SCM practices, top management support has the highest total effect on the dependent variable. The implementation of this practice can create an environment to support for the other SCM practices. In particular, the influence of top management support on supplier management and customer focus provides the evidence about the importance of top management support in building the relationship among partners in the supply chain, supplier – firm – customer. Top management support plays a role as “an adhesive” connecting members together. In addition, top management support can also maximize the capacity of the supply chain through quality policies and objectives which mobilize participation of all employees in order to determination of customers' needs and wants assessment and selection of suppliers improvement of production processes. These things can indirectly improve OP. Hence, we can conclude that top management support has an indirect relationship with OP.

6. Conclusions and implications

This study provided empirical evidences that prove importance of the SCM practices in improving OP. Accordingly these SCM practices could explain 52.6 percent variance of OP. This is a remarkable rate because not only the SCM practices suggested in this study, OP is also impacted by others, such as operating environment, capital, technology, equipment, human resource, information, etc. Each of above practices has a certain impact, and not any is the unique one to effect on OP. As a consequence, enterprises which have limited resources for equipment investment, technological innovations will be able to remarkably improve OP by implementing these SMC practices. In other words, in the same conditions of finance, technology, equipment, environment, etc., those that can well address these SCM practices will have higher OP.

Moreover, this study explored the relationship between each SCM practice and OP. In particular, customer focus and supplier management both direct and indirect impact on OP while top management support and process control/improvement only have indirect and direct influences on OP, respectively. Also, this research confirmed role of top management support that does not have direct impact on OP, but indirectly influences on OP through the relationship with the other SCM practices.

In the effort of successfully applying these SCM practices, companies should start with the most important practice – top management support that drives firm's efforts toward an effective supply chain. Then the process could be continued with three main activities, comprising supplier management – process control and improvement – customer focus. We suggest that these SCM practices should be implemented as an integrated system rather than independent practices. In this system, they interact with each other and have the “resonant” influence on improving OP. The enhancement of OP leads to the augment on revenue and profit. Employee income will rise and their living conditions also get better. Consequently, their loyalty to company enhances and government budget is also increased via tax.

Finally, regarding the research model, the proposed structural equation model analyzing the relationship among SCM practices and OP as well as its validation using the data collected from the Vietnam garment context provided valuable insights both from theoretical and practical perspectives. However, in the scope of this study, there are some limitations that can guide academics to new lines of future research: to extend the scope of the survey to include different countries and new situations, so results can be generalized and to consider the impacts of the SCM practices on the entire supply chain performance, to explore additional factors that can further explain OP, such as operational environment, capital, technology, human resource, etc.

References

- Abraham, M., Crawford, J. and Fisher, T. (1999), "Key factors predicting effectiveness of cultural change and improved productivity in implementing total quality management", *International Journal of Quality & Reliability Management*, Vol. 16 No. 2, pp. 112-132.
- Adam, E.E., Corbett, L.M., Flores, B.E., Harrison, N.J., Lee, T.S., Rho, B.-H., Ribera, J., Samson, D. and Westbrook, R. (1997), "An international study of quality improvement approach and firm performance", *International Journal of Operations & Production Management*, Vol. 17 No. 9, pp. 842-873.
- Ahire, S.L. and Dreyfus, P. (2000), "The impact of design management and process management on quality: an empirical investigation", *Journal of Operations Management*, Vol. 18 No. 5, pp. 549-575.
- Ahire, S.L. and O'Shaughnessy, K.C. (1998), "The role of top management commitment in quality management: an empirical analysis of the auto parts industry", *International Journal of Quality Science*, Vol. 3 No. 1, pp. 5-37.
- Ahire, S.L. and Ravichandran, T. (2001), "An innovation diffusion model of TQM implementation", *IEEE Transactions on Engineering Management*, Vol. 48 No. 4, pp. 445-464.
- Anderson, E.W., Fornell, C. and Lehmann, D.R. (1994), "Customer satisfaction, market share, and profitability: findings from Sweden", *The Journal of Marketing*, Vol. 58 No. 3, pp. 53-66.
- Anderson, J.C., Rungtusanatham, M., Schroeder, R.G. and Devaraj, S. (1995), "A path analytic model of a theory of quality management underlying the deming management method: preliminary empirical findings", *Decision Sciences*, Vol. 26 No. 5, pp. 637-658.
- Antony, J., Leung, K., Knowles, G. and Gosh, S. (2002), "Critical success factors of TQM implementation in Hong Kong industries", *International Journal of Quality & Reliability Management*, Vol. 19 No. 5, pp. 551-566.
- Armstrong, J.S. and Overton, T.S. (1977), "Estimating nonresponse bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No. 3, pp. 396-402.
- Bollen, K.A. (1989), *Structural Equations with Latent Variables*, Wiley, Chapel Hill, NC.
- Byrne, B.M. (1998), *Structural Equation Modeling with LISREL, PRELIS, and SIMPLIS: Basis Concepts, Application and Programming*, Lawrence Erlbaum Associates Inc. Publishers, Mahwah, NJ.
- Carmines, E.G. and Mciver, J.P. (1981), "Analyzing models with unobserved variables", in Bohrnstedt, G.W. and Borgatta, E.F. (Eds), *Social Measurement: Current Issues*, Sage Publications, Beverly Hills, CA, pp. 65-115.
- Chen, I.J. and Paulraj, A. (2004), "Towards a theory of supply chain management: the constructs and measurements", *Journal of Operations Management*, Vol. 22 No. 2, pp. 119-150.
- Christopher, M. (2013), *Logistics and Supply Chain Management eBook*, Pearson Education, Harlow.
- De Cerio, J.M.-D. (2003), "Quality management practices and operational performance: empirical evidence for Spanish industry", *International Journal of Production Research*, Vol. 41 No. 12, pp. 2763-2786.

- Dow, D., Samson, D. and Ford, S. (1999), "Exploding the myth: do all quality management practices contribute to superior quality performance?", *Production and Operations Management*, Vol. 8 No. 1, pp. 1-27.
- Easton, G.S. and Jarrell, S.L. (1998), "The effects of total quality management on corporate performance: an empirical investigation", *The Journal of Business*, Vol. 71 No. 2, pp. 253-307.
- Ellram, L.M. (1995), "A managerial guideline for the development and implementation of purchasing partnerships", *International Journal of Purchasing and Materials Management*, Vol. 31 No. 1, pp. 9-16.
- Feng, J., Prajogo, D.I., Tan, K.C. and Sohal, A.S. (2006), "The impact of TQM practices on performance: a comparative study between Australian and Singaporean organizations", *European Journal of Innovation Management*, Vol. 9 No. 3, pp. 269-278.
- Fening, F.A., Pesakovic, G. and Amaria, P. (2008), "Relationship between quality management practices and the performance of small and medium size enterprises (SMEs) in Ghana", *International Journal of Quality & Reliability Management*, Vol. 25 No. 7, pp. 694-708.
- Flynn, B.B., Schroeder, R.G. and Sakakibara, S. (1994), "A framework for quality management research and an associated measurement instrument", *Journal of Operations Management*, Vol. 11 No. 4, pp. 339-366.
- Flynn, B.B., Schroeder, R.G. and Sakakibara, S. (1995), "The impact of quality management practices on performance and competitive advantage", *Decision Sciences*, Vol. 26 No. 5, pp. 659-691.
- Forker, L.B. (1997), "Factors affecting supplier quality performance", *Journal of Operations Management*, Vol. 15 No. 4, pp. 243-269.
- Forza, C. and Filippini, R. (1998), "TQM impact on quality conformance and customer satisfaction: a causal model", *International Journal of Production Economics*, Vol. 55 No. 1, pp. 1-20.
- Fredendall, L.D. and Hill, E. (2000), *Basics of Supply Chain Management*, Taylor & Francis, Abingdon.
- Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1995), *Multivariate Data Analysis: With Readings*, 4th ed., Prentice Hall, Englewood Cliffs, NJ.
- Harrison, A. and New, C. (2002), "The role of coherent supply chain strategy and performance management in achieving competitive advantage: an international survey", *Journal of the Operational Research Society*, Vol. 53 No. 3, pp. 263-271.
- Heizer, J.H., Render, B. and Weiss, H.J. (2008), *Principles of Operations Management*, Pearson Prentice Hall, PA.
- Ho, D.C.K., Duffy, V.G. and Shih, H.M. (1999), "An empirical analysis of effective TQM implementation in the Hong Kong electronics manufacturing industry", *Human Factors and Ergonomics in Manufacturing & Service Industries*, Vol. 9 No. 1, pp. 1-25.
- Hoegl, M. and Wagner, S.M. (2005), "Buyer-supplier collaboration in product development projects", *Journal of Management*, Vol. 31 No. 4, pp. 530-548.
- Hugos, M.H. (2011), *Essentials of Supply Chain Management*, Wiley, CO.
- Jaccard, J. and Wan, C.K. (1996), *LISREL Approaches to Interaction Effects in Multiple Regression*, Sage University Paper Series on Quantitative Applications in the Social Sciences 07-114, Sage Publications, Thousand Oaks, CA.
- Joreskog, K.G. and Sorbom, D. (1993), *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*, Lawrence Erlbaum Associates Publishers, Hillsdale, NJ.
- Kaynak, H. (2003), "The relationship between total quality management practices and their effects on firm performance", *Journal of Operations Management*, Vol. 21 No. 4, pp. 405-435.
- Kaynak, H. and Hartley, J.L. (2008), "A replication and extension of quality management into the supply chain", *Journal of Operations Management*, Vol. 26 No. 4, pp. 468-489.
- Kline, R.B. (1998), *Principles and Practice of Structural Equation Modeling*, Guilford Press, New York, NY.

- Lakhal, L., Pasin, F. and Limam, M. (2006), "Quality management practices and their impact on performance", *International Journal of Quality & Reliability Management*, Vol. 23 No. 6, pp. 625-646.
- Lee, H., Padmanabhan, P. and Whang, S. (1997), "The bullwhip effect in supply chains", *Sloan Management Review*, Vol. 38 No. 3, pp. 93-102.
- Li, S., Rao, S.S., Ragu-Nathan, T.S. and Ragu-Nathan, B. (2005), "Development and validation of a measurement instrument for studying supply chain management practices", *Journal of Operations Management*, Vol. 23 No. 6, pp. 618-641.
- Muthen, B. and Kaplan, D. (1985), "A comparison of some methodologies for the factor-analysis of non-normal Likert variables", *British Journal of Mathematical and Statistical Psychology*, Vol. 38 No. 2, pp. 171-180.
- Nair, A. (2006), "Meta-analysis of the relationship between quality management practices and firm performance – implications for quality management theory development", *Journal of Operations Management*, Vol. 24 No. 6, pp. 948-975.
- Nunnally, J.C. (2010), *Psychometric Theory 3E*, Tata McGraw-Hill Education, New Delhi.
- Ou, C.S., Liu, F.C., Hung, Y.C. and Yen, D.C. (2010), "A structural model of supply chain management on firm performance", *International Journal of Operations & Production Management*, Vol. 30 No. 5, pp. 526-545.
- Podsakoff, P.M., Mackenzie, S.B., Lee, J.-Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology of Sport and Exercise*, Vol. 88 No. 5, pp. 879-903.
- Powell, T.C. (1995), "Total quality management as competitive advantage: a review and empirical study", *Strategic Management Journal*, Vol. 16 No. 1, pp. 15-37.
- Prajogo, D.I. and Brown, A. (2004), "The relationship between TQM practices and quality performance and the role of formal TQM programs: an Australian empirical study", *The Quality Management Journal*, Vol. 11 No. 1, pp. 31-42.
- Rahman, S.-U. and Bullock, P. (2005), "Soft TQM, hard TQM, and organisational performance relationships: an empirical investigation", *Omega*, Vol. 33 No. 1, pp. 73-83.
- Robinson, C.J. and Malhotra, M.K. (2005), "Defining the concept of supply chain quality management and its relevance to academic and industrial practice", *International Journal of Production Economics*, Vol. 96 No. 3, pp. 315-337.
- Samson, D. and Terziovski, M. (1999), "The relationship between total quality management practices and operational performance", *Journal of Operations Management*, Vol. 17 No. 4, pp. 393-409.
- Saraph, J.V., Benson, P.G. and Schroeder, R.G. (1989), "An instrument for measuring the critical factors of quality management", *Decision Sciences*, Vol. 20 No. 4, pp. 810-829.
- 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.
- Singh, P.J. (2008), "Empirical assessment of ISO 9000 related management practices and performance relationships", *International Journal of Production Economics*, Vol. 113 No. 1, pp. 40-59.
- Sila, I. and Ebrahimpour, M. (2005), "Critical linkages among TQM factors and business results", *International Journal of Operations & Production Management*, Vol. 25 No. 11, pp. 1123-1155.
- Steenkamp, J.-B.E.M. and Van Trijp, H.C.M. (1991), "The use of lisrel in validating marketing constructs", *International Journal of Research in Marketing*, Vol. 8 No. 4, pp. 283-299.
- Tabachnick, B.G. and Fidell, L.S. (2012), *Using Multivariate Statistics*, Pearson Education, Harlow.
- Talib, F., Rahman, Z. and Qureshi, M.N. (2011), "A study of total quality management and supply chain management practices", *International Journal of Productivity and Performance Management*, Vol. 60 No. 3, pp. 268-288.
- Tan, K.C. (2001), "A framework of supply chain management literature", *European Journal of Purchasing & Supply Management*, Vol. 7 No. 1, pp. 39-48.

- Tarí, J.J., Molina, J.F. and Castejón, J.L. (2007), "The relationship between quality management practices and their effects on quality outcomes", *European Journal of Operational Research*, Vol. 183 No. 2, pp. 483-501.
- Terziowski, M. (2006), "Quality management practices and their relationship with customer satisfaction and productivity improvement", *Management Research News*, Vol. 29 No. 7, pp. 414-424.
- Trent, R.J. and Monczka, R.M. (1999), "Achieving world-class supplier quality", *Total Quality Management*, Vol. 10 No. 6, pp. 927-938.
- Tse, A., Tse, K., Yin, C., Ting, C., Yi, K., Yee, K. and Hong, W. (1995), "Comparing two methods of sending out questionnaires: e-mail versus mail", *Journal of Market Research Society*, Vol. 37 No. 4, pp. 441-446.
- 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.
- Vonderembse, M.A. and Tracey, M. (1999), "The impact of supplier selection criteria and supplier involvement on manufacturing performance", *Journal of Supply Chain Management*, Vol. 35 No. 2, pp. 33-39.
- Yeung, A.C.L. (2008), "Strategic supply management, quality initiatives, and organizational performance", *Journal of Operations Management*, Vol. 26 No. 4, pp. 490-502.
- Zehir, C. and Sadikoglu, E. (2010), "The relationship between total quality management (TQM) practices and organizational performance: an empirical investigation", *International Journal of Production Economics*, Vol. 101 No. 2, pp. 1-45.
- Zu, X. (2009), "Infrastructure and core quality management practices: how do they affect quality?", *International Journal of Quality & Reliability Management*, Vol. 26 No. 2, pp. 129-149.
- Zu, X., Fredendall, L.D. and Douglas, T.J. (2008), "The evolving theory of quality management: the role of Six Sigma", *Journal of Operations Management*, Vol. 26 No. 5, pp. 630-650.

Further reading

- Garver, M.S. and Mentzer, J.T. (1999), "Logistics research method: employing structural equation modeling to test for construct validity", *Journal of Business Logistics*, Vol. 20, pp. 33-57.
- Parasuraman, A. (1991), *Marketing Research*, 2nd ed., Addison-Wesley, Boston, MA.

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