An Impact of Supply Chain Management Components on Firm Performance

Veera Boonjing[1], Pisit Chanvarasuth[2] and Chalermsak Lertwongsatien[3]

Abstract

Over the past decade, there has been an increasing emphasis on Supply Chain Management (SCM) as a vehicle through which many companies can achieve a competitive advantage. Despite the importance of supply chain within today's economy, we know little about how supply chain management components can contribute to firm performance. Building on prior supply chain literature, the purpose of this study is to investigate the relationship between eleven SCM management components and firm performance. Correlations and simple regression analysis were used to analyze the data. The results from this study support the positive relationship between components and performance. After the results were analyzed, top five ranking of eleven SCM components were identified. These findings provide important insights for managers to understand the nature of their firms to better leverage critical SCM components. This study can also be considered as one of a few empirical works that specially investigate the relationships between SCM components and firm performance.

Keywords: supply chain management, supply chain management components, firm performance.

Introduction

Throughout the world, firms are now facing a fierce competition from both local and global players. Therefore, cross-country activities are normal and to be expected. As a result, there are growing attentions for many firms on global supply chain management (SCM). Of interest in this study is the role of supply chain management components in the supply chain management processes. These components are key factors for firms to achieve competitive advantage and good performance. However, empirical study linking supply chain initiatives with firm performance remains scarce. In addition, the essential features that lead to such an achievement have not been fully explored. Therefore, this study attempts to introduce a conceptual framework to illustrate causal links between SCM components and firm performance. The results allow us to identify major component(s) that have a statistically significant impact on firm performance across a large data set of Thai firms. Our research also helps to illuminate important priorities for supply chain managers by focusing on certain supply chain components over others.

[1] Associate Professor, International College, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand, Tel: +662-3298261, E-mail: boonjv@gmail.com.

[2] Assistant Professor, School of Management Technology, Sirindhorn International Institute of Technology, Thammasat University, Pathumthani, Thailand, Tel: +662-5013505, E-mail: pisit@siit.tu.ac.th.

[3] Office of Permanent Secretary, Ministry of Finance, Bangkok, Thailand, Tel: +662-298-6456, E-mail: lertwc@gmail.com.

Literature Review

Supply Chain Management (SCM)

Supply Chain Management (SCM) has been defined to explicitly recognize the strategic nature of the coordination and collaboration between trading partners that involved suppliers, manufacturers, intermediaries, service providers, and customers (Cooper, et al., 1997; Moberg et al., 2004). New and Payne (1995) defined supply chain management as the chain linking each element of the manufacturing and supply process from raw materials through to the end user, encompassing several firm boundaries. According to these broad definitions, SCM incorporates the entire value chain and address materials and supply management from the extraction of raw materials to its end of useful life. The objective of developing the General Supply Chain Model is to provide a complete understanding of supply chains, in terms of both their management and their operation (Janvier-James, 2012).

Supply Chain Management Components

Although the structure of supply chain network and key business processes to integrate with the targeted supply chain members are important elements of the supply chain process, firms must actually implement SCM and integrate processes among members in supply chain network. The level of integration of the business process across the supply chain can increase by adding more the level of each component or the management components (Lambert et al., 1998) That is, the key element of SCM implementation is the set of management components that facilitate and manage integration among firms.

The SCM management component is one of the three major and closely related elements of the SCM framework proposed by several researchers (e.g., Andrew and Stalick, 1994; Lambert et al., 1998). The management components are the components by which the business processes are structured and managed. There are certain management components that are common across all business processes and members of the supply chain (Cooper et al., 1997). It is the management of these common components that are critical for SCM success, since they essentially represent and determine how each process link is integrated and managed. Adding more management components or increasing the level of each component can increase the level of integration of the business process link.

Prior research has identified eleven SCM management components, which can be categorized into two major groups: (1) physical and technical and (2) managerial and behavioral. There are six components in physical and technical group, which are: planning and control methods, work flow/activity structure, organization structure, communication and information flow structure, knowledge management, and product flow structure. In addition, there are five major components in managerial and behavioral group, which are: management methods, power and leadership structure, risk and reward structure, culture/attitude, and trust/commitment. These components help the manager to drive the firm to success of achieving increased integration of processes, and ultimately improved firm performance.

Development of Hypotheses

In this study, we attempt to examine all possible SCM management components proposed in prior literature by redefining and categorizing eleven SCM components into two new

major groups, which are: structural management components and behavior management components. In addition, we also try to reexamine the relationships between these eleven SCM management components and firm performance. Cost and customer service are chosen as measurements for firm performance (see Figure 1).

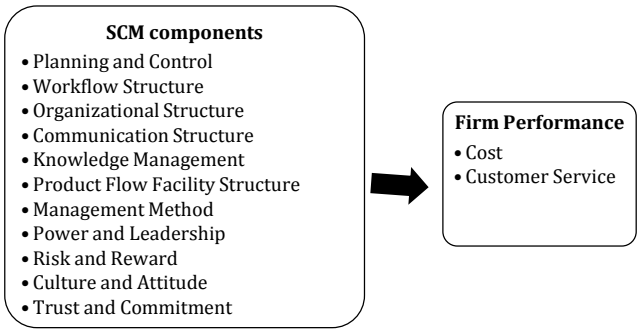

Figure 1. Conceptual Model.

Structural Management Components

The group of structural management components or the group of physical and technical management components involves with "visible, tangible, measurable, and easy-to-change components" (Lambert et al., 1998)

Planning and Control of operations are defined as the key to move firm operation or its supply chain following its desired direction. Planning and control predict the possible events and prepare the response for contingency events. The extent of planning and control is the implementation, evaluation, feedback, and improvement of the firm activities and business processes that follow objective, strategies, policies of the firm and its supply chain (Cooper et al., 1997).While planning and control component are conducted, the firm activities and business processes are executed with efficient direction. If activities and processes are changed, they will simultaneously trigger changes in firm performance. Thus, planning and control are expected to have positive relationships with firm performance.

Hypothesis 1a: There is a positive relationship between planning and firm performance.

Hypothesis 1b: There is a positive relationship between control and firm performance.

Workflow Structure is defined as the way and the place that works are done within an organization and its supply chain (Anderson and Narus, 1990). In order to manage this particular SCM management component, firms must realize their business environment and circumstances that will eventually develop to be knowledge on purposes of doing such operations. This allows them to evaluate the firms in terms of the way works are done. Workflow structure helps firm to manage the operation of works. Furthermore, workflow structure has the objective of minimizing costs in the supply chain. If works are performed reasonable well, firm performance should be changed. Thus, workflow structure is expected to have a positive relationship with firm performance.

Hypothesis 2: There is a positive relationship between workflow structure and firm performance.

Organizational Structure refers to a team within the firm or across the supply chain. Organizational structure integrates with top-down and bottom-up organization structure. The use of cross-functional teams would suggest more of a process approach. While organizational structure is conducted, the firm's position and function are aligned. If the position and function are aligned properly, firm performance should be changed. Thus, organizational structure is expected to have a positive relationship with firm performance.

Hypothesis 3: There is a positive relationship between organizational structure and firm performance.

Communication Structure refers to the information flow within the firm or across supply chain members. Communication structure is a special SCM management component that controls the distribution of information. Successful communication means that the original message must be sent with the right information, at the right time, person, and format (Moberg et al., 2004). Moreover, the frequency of information updating provides the most effect on supply chain activities (Cooper et al., 1997). If the information can be distributed efficiently, firm performance should be changed. Thus, communication structure is expected to have a positive relationship with firm performance.

Hypothesis 4: There is a positive relationship between communication structure and firm performance.

Knowledge Management is the set of business processes developed in a firm to create, store, transfer, and apply necessary knowledge and expertise for the firm's operation (Malhotra, 2000). Knowledge management increases the ability of the firm to learn from its environment and to integrate their knowledge into its business processes. If the company can manage and distribute the useful knowledge, firm performance should be changed. Thus, knowledge management is expected to have a positive relationship with firm performance.

Hypothesis 5: There is a relationship between knowledge management and firm performance.

Product Flow Facility Structure is the structure of the product flow within and across the firms in the supply chain that starts from procurement and manufacturing to shipping finished products (Cooper et al., 1997). Members in the supply chain cooperate with each other to control the flow of their products in order to gain the highest benefit. It also affects firm's inventory and warehouses. In general, product flow facility structure is conducted in order to manage the flow of such products. If the product flow is efficient, firm performance should be changed. Thus, product flow facility structure is expected to have a positive relationship with firm performance.

Hypothesis 6: There is a relationship between product flow facility structure and firm performance.

Behavioral Management Components

The group of behavioral management components or the group of managerial components is difficult to change and evaluate because its components are usually "less tangible and visible" (Lambert et al., 1998). The behavioral management components influence the behavior of the firm and provide a support for the implementation of structure management components to create more competitive advantage and profit. Moreover, if one or more components in the group of structure management components are aligned with the firm strategy, components in the group of behavioral management components may also be altered. In this study, we propose that there are five out of eleven SCM management components in this behavioral management group, which are management method, power and leadership, risk and reward, culture and attitude, and trust and commitment.

Management Method is the key of using the corporate processes and management techniques to manage the operation of workers (Cooper et al., 1997). Managers need to assign work to match the skill and competency of an individual worker. In addition, managers can also encourage workers to work more effectively and efficiently. Then, management method is really important for assigning and motivating workers in the firm. Moreover, the level of management in the firm can differ across the supply chain. If workers can perform the work effectively and efficiently, firm performance should be changed. Thus, management method is expected to have a relationship with firm performance.

Hypothesis 7: There is a positive relationship between management method and firm performance.

Power and Leadership structure will definitely affect the whole supply chain. One strong channel leader will provide a direction, manage the channel, and execute the strategy for the firm's internal team and supply chain members (Cooper and Ellram, 1993). Exercising power or a lack of power can affect the level of commitment of other channel members. It is critical for firms to strengthen their relationships with other firms in the supply chain. If the strong leaders can manage their power efficiently, firm performance should be changed. Thus, power and leadership are expected to have positive relationships with firm performance.

Hypothesis 8a: There is a positive relationship between power and firm performance.

Hypothesis 8b: There is a positive relationship between leadership and firm performance.

Risk and Reward comes from the relationship between channel members who are willing to share (Cooper and Ellram, 1993). If the value of the reward and the amount of risk in a relationship is unsatisfactory for one firm, such relationship will not be last. Risk and reward component can support and strengthen the relationship between supply chain members. If the company has the satisfied relationship, firm performance should be changed. Thus, risk and reward are expected to have positive relationships with firm performance.

Hypothesis 9a: There is a positive relationship between risk and firm performance.

Hypothesis 9b: There is a positive relationship between reward and firm performance.

Culture and Attitude are necessary for firms to perform as a part of the chain. In general, the processes of building these factors are time-consuming. These factors will provide valid

ways for other firms to understand why members perform such activities in the chain (Cooper et al., 1997). Culture and individual attitude of supply chain members acknowledge the ways they think and see things. Culture and attitude component is the fundamental to influence the thinking of workers in the firm. If the workers incorporate well with the organization, firm performance should be changed. Thus, culture and attitude are expected to have positive relationships with firm performance.

Hypothesis 10a: There is a positive relationship between culture and firm performance.

Hypothesis 10b: There is a positive relationship between attitude and firm performance.

Trust and Commitment exist when one company has confidence in chain partner's reliability and integrity to create a strong and long-term relationship. Trust and commitment are also commonly used to increase the collaboration and information sharing between members (Moberg et al., 2004). Therefore, trust and commitment component can be conducted to create a strong and long-term relationship between members in the supply chain. If the company has efficient collaboration between supply chain partners, firm performance should be changed. Thus, trust and commitment are expected to have positive relationships with firm performance.

Hypothesis 11a: There is a positive relationship between trust and firm performance.

Hypothesis 11b: There is a positive relationship between commitment and firm performance.

Firm Performance

Firm performance has been evaluated by several researchers in different manner to assist firm in measuring their supply chain. Richey et al. (2009) pointed out a number of problems in the metrics used to measure the firm performance. They argued that measurement of firm performance is very fragmented within and across the firms. Sukati et al. (2012) argued that validating the firm performance should include three different types of performance measurement which are resources measurement, output measurement, and flexibility. Each of these types is equally important in measuring the firm performance. In this study, we use cost and customer service to evaluate firm performance.

Methodology

The questionnaire survey was distributed to companies that have logistic departments and operate in Thailand. The sample selected included firms with large scale operations, which are engaged in garment, food and beverage, healthcare, electronic, and automobile industry. We collected data by distributing four hundred questionnaires by e-mail and regular mail. The target respondent was the company's CEO. The questionnaire was distributed over a two-month period started from January 2015 to February 2015.

A total of 400 questionnaires were sent directly to the firms included in the survey sample. Of these, 17 questionnaires were returned by respondent unwilling to participate. Of the 253 completed questionnaires that were received, 12 had missing data and, hence, could not be used in the data analysis. The response rate was 60.25 percent (from 241 valid responses). Table 1 lists the respondent characteristics.

Table 1. Profile of respondents

Demographic characteristics	Frequency	Percentage
Gender		
Male	113	46.9
Female	128	53.1
Age		
Below 25	29	12
25-30	70	29
31-35	43	17.8
36-40	41	17
41-50	40	16.6
Above 50	18	7.5
Education		
High School Diploma	49	20.3
Bachelors Degree	132	54.8
Graduate Degree	60	24.9
Work Experience (years)		
Less than 5	111	46.1
5-10	53	22.0
11-15	41	17.0
Above 15	36	14.9
Work Department		
Human Resource	11	4.6
Finance/Accounting	34	14.1
Marketing	39	16.2
Production	63	26.1
Transportation	18	7.5
Others	76	31.5
Job Responsibility		
Leader/Management	91	37.8
Operation	150	62.2
Industry Type		
Garment	6	2.5
Food and Beverage	56	23.2
Healthcare	14	5.8
Electronic	11	4.6
Automobile	52	21.6
Others	102	42.3
Role in the Supply Chain		
Supplier	38	15.8
Manufacturer	115	47.7
Distributor	88	36.5
Total of respondents	241	100.0

Results

Table 2 shows the results from the questionnaire survey regarding the top five ranking of SCM management components considered by respondents.

Table 2. SCM components ranking

Rank	SCM Components
1	Planning and control
2	Workflow structure
3	Product flow facility structure
4	Management method
5	Knowledge management

Each hypothesis is first tested individually with correlation analysis. This is followed by a simple regression analysis that simultaneously tests all hypotheses relating to each dependent variable. Table 3 shows the results of testing the correlations between eleven SCM components and the two firm performance measures, cost and customer services. The positive correlation indicates that the sooner the firm implements all SCM components, the better the firm performance.

Table 3. Correlation Results

SCM Component	Firm Performance	
	Cost	Customer Service
Physical and Technical Components		
Planning and control methods	0.307**	0.357**
Work flow/activity structure	0.348**	0.361**
Organization structure	0.280**	0.283**
Communication structure	0.363**	0.383**
Knowledge management	0.294**	0.288**
Product flow facility structure	0.353**	0.368**
Managerial and Behavioral Components		
Management methods	0.334**	0.372**
Power and leadership structure	0.247**	0.260**
Risk and reward structure	0.331**	0.351**
Culture/attitude	0.240**	0.276**
Trust and Commitment	0.375**	0.390**

** = Correlation is significant at 0.01 level (2-tailed)

A series of regression analyses were conducted to test causal relationships to find the most closely related SCM components with cost and customer service performance. Table 4 shows a regression analysis results. Power and Leadership structure and Trust and Commitment are significantly related to both cost and customer service performance ($p < 0.05$). Culture/Attitude is also significantly related with cost performance ($p < 0.05$). However, both Culture/Attitude and Management Methods are partially related with customer service performance ($p < 0.10$). However, the low adjusted R^2 indicates that there are possibly other factors that might explain firm cost and customer service performance

variance. We found that only managerial and behavioral components have impact on firm performance, except risk and reward factors. Table 5 summarizes all statistical results for this study.

Table 4. Regression Results

SCM Components	Cost Performance			Customer Service Performance		
	B	**t-value**	**Sig.**	**B**	**t-value**	**Sig.**
Constant	1.973	7.331	0.000	1.995	7.552	0.000
Physical and Technical Components						
Planning and control methods	0.030	0.251	0.802	0.161	1.356	0.177
Work flow/activity structure	0.173	1.225	0.222	0.128	0.924	0.357
Organization structure	0.034	0.280	0.780	-0.003	-0.023	0.982
Communication structure	0.169	1.291	0.198	0.206	1.600	0.111
Knowledge management	0.016	0.113	0.910	-0.094	-0.695	0.488
Product flow facility structure	0.050	0.347	0.729	0.012	0.084	0.933
Managerial and Behavioral Components						
Management methods	0.141	0.974	0.331	0.244	1.717	0.087
Power and leadership structure	-0.290	-2.320	**0.021**	-0.290	-2.368	**0.019**
Risk and reward structure	0.115	0.820	0.413	0.050	0.366	0.715
Culture/attitude	-0.330	-2.456	**0.015**	-0.247	-1.872	0.062
Trust and Commitment	0.315	2.658	**0.008**	0.294	2.525	**0.012**
R Square	0.206			0.226		
Adj. R Square	0.167			0.189		
F-value for model	5.387 (Sig.= 0.000)			6.084 (Sig.=0.000)		

Table 5. Summary of Statistical Results

SCM Component	Correlation Analysis		Regression Analysis	
	Cost	**Customer Service**	**Cost**	**Customer Service**
Physical and Technical Components				
Planning and control methods	Yes	Yes	No	No
Work flow/activity structure	Yes	Yes	No	No
Organization structure	Yes	Yes	No	No
Communication structure	Yes	Yes	No	No
Knowledge management	Yes	Yes	No	No
Product flow facility structure	Yes	Yes	No	No
Managerial and Behavioral Components				
Management methods	Yes	Yes	No	Partial
Power and leadership structure	Yes	Yes	Yes	Yes
Risk and reward structure	Yes	Yes	No	No
Culture/attitude	Yes	Yes	Yes	Partial
Trust and Commitment	Yes	Yes	Yes	Yes

Conclusions

The main purpose of this research is to figure out the relationship between eleven SCM components and the firm performance. The researcher built the model and hypothesis based on eleven SCM components. We collected the data based on the primary data which built with surveys. 241 firms are chosen from five industries, Garment, Food and Beverage, Healthcare, Electronic, and Automobile industry and which the firms that have logistics department. The results showed that all eleven SCM components have positive relationship with firm performance (cost and customer service). In addition, we also found that the top five ranking of SCM components that firm should focus are Planning and Control, Workflow Structure, Product Flow Facility Structure, Management Methods, and Knowledge Management, respectively. However, the most impact SCM component factors on firm performance are in the group of Managerial and Behavioral Components.

For managerial implications, this study is contributing in increasing the understanding of SCM components and be able to get the highest benefits from them. Furthermore, the results are expected to contribute academically to the development of literature in operations management, supply chain management, and strategic management in particular. However, this study examined only cost and customer service as variables to represent firm performance. Future research should examine other variables in firm performance such as production and the collaboration between firms within supply chain to shed more lights on the impact of SCM components.

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