The impact of global supply chain management on performance: Evidence from Textile and garment industry

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ABSTRACT

The article was conducted on 529 textile enterprises in the Vietnam Textile and Garment Business Directory 2018 with the aim of assessing the impact of global supply chain management practices on competitive advantage and operational efficiency. After using PLS-SEM analysis techniques on Smart PLS 3.0, the results show that the global supply chain management practices of Vietnam's textile and garment industry had a positive impact on the performance of Vietnam textile and garment enterprises. In addition, competitive advantages such as Customer Loyalty, Employee Satisfaction and Corporate Reputation had no intermediary role in the relationship between global supply chain management and operational efficiency in Vietnamese textile enterprises.

KEYWORDS: Global supply chain management, Performance, Competitive advantages, Textile and garment, Vietnam

1. Introduction

In the trend of globalization and international economic integration, joining the global value chain is the indispensable rule. Every product that is created has value, including a chain of connected valuable links (Alvarado & Kotzab, 2001; Cagliano et al., 2008). In the context of integration, the links that create the ultimate value of a product has transcended national-territorial boundaries but still has global values. Vietnam textile as well as other sectors of the national economy have actively participated in the world market. Although in recent years, Vietnam's textile and garment industry has had a relatively high growth rate of exports with the second largest export turnover (the first largest export turnover is oil and gas) but the added value and profit are low. To explain this, it is necessary to analyze Vietnam's textile and apparel export value chain, thereby providing effective solutions to add value in Vietnam's textile and apparel export value chain (Dornier et al., 2008; Kim & Lee, 2010; Walker et al., 2008).

Value chains can be implemented within a geographical area or spread over many countries and become global value chains. In this view, businesses from many countries around the world will act as important links and can govern the development of the value chain. The analysis of business operations from the perspective of the value chain is an effective method to best evaluate the competitiveness as well as the role and scope of the influence of the country in the global value chain. From the perspective of the
global textile value chain: the product design is carried out in famous fashion centers in the world such as Paris, London, New York, etc. The main material is fabric produced in Korea, China or other accessories manufactured in India. The production and processing of final products is done in countries with low labor costs such as Vietnam, China, etc. The finished textile products will be sold on the market by reputable trading companies such as Nguyen Manh Hung company (2008). In the global textile and apparel value chain, the most profitable stages are the sample design, raw materials supply and trade. However, Vietnam's textile and apparel industry only participates in the production of final products with the lowest value added in the value chain. It is estimated that about 90% of Vietnamese garment enterprises are involved in this part of the value chain in the form of outsourcing. Therefore, although Vietnam's textile and garment products are exported to many places and Vietnam is named in the top 10 largest textile and garment exporting countries in the world, the value is very low.

Textile and garment industry has a large export turnover, accounting for about 20% of the country's total export turnover. In recent years, exports of this industry have surpassed oil and gas, only behind electronic components to occupy the second position in export turnover. In 2018, the textile industry has made positive growth: Export turnover reached approximately USD 36 billion, an increase of nearly 20% compared to 2017 (Textile and Apparel Association, 2018).

This literature was conducted with the objective of evaluating the impact of global textile supply chain management on the competitive advantage and performance of textile enterprises, as a piece of convincing evidence to help textile enterprises become confident to participate in the global supply chain of textile industry and to improve operational efficiency. The structure of the literature, in addition to the introduction, includes the literature overview, research methodology, research results, and conclusion.

2. Literature review

2.1 Global supply chains

Ganesham and Harison (1995), Rudberg and West (2008) and Reyes et al. (2002) argued that the supply chain is a network of production and distribution options that perform the functions of purchasing materials, converting materials into semi-finished and finished products, and distributing them to customers. Chopra Sunil and Peter Meidl (2001), Klassen and Whybark (1994), Motwani et al. (2000) argue that the supply chain includes all stages involved, directly or indirectly, in meeting customer needs. The supply chain includes not only manufacturers and suppliers, but also carriers, warehouses, retailers and customers themselves. OECD (2013) argues that global value chains are the whole process of producing goods, from raw materials to finished products, carried out wherever skills and materials are needed to produce them and are available at competitive prices as well as quality assurance. Global supply chains and global value chains are conceptually different. The global supply chain implies all activities related to the connection of product purchasing, manufacturing and logistics activities on a global scale; while value chains involve a range of production activities, creating added value for products through consumers. The supply chain relates to managing the operations of the business, from which products move from one place to another, while the value chain relates to the business management of the business. The most important purpose of the global supply chain is towards customer satisfaction, while the most important purpose of the global value chain is to achieve the competitive advantage of the business. In the context of globalization, competition pressure on enterprises is increasingly fierce (Gereffi et al., 2005). Globalization helps businesses participate in world markets, increase surplus value and develop market share (Gereffi et al., 2005). However, businesses also face risks when participating in the world market such as exchange rate risk, shipping risk and information uncertainty of partners to business disadvantages can even make it difficult for businesses to operate continuously (Gunasekaran et al., 2008; Kale, 2007). Because of the opportunities and challenges of joining the global supply chain, it is always an interesting business problem for managers as well as attracting a large number of global supply chain researchers (Prasad & Babbar, 2000; Meixell & Gargeya, 2005).
Some authors point out the similarity between domestic supply chains and global supply chains (Li & Lin, 2006). However, some authors emphasize that global supply chain management is far more complex than domestic supply chains (Vidal & Goetschalckx, 1997; Sajadieh, 2009). The domestic supply chain relates to the supply, production and consumption businesses in a country, while the global supply chain is a collection of suppliers, producers and consumers worldwide therefore depends on many objective factors such as: geographic distance, culture, language, law. However, a good global supply chain management will significantly reduce business risk (MacCarthy & Atthirawong, 2003; Sajadieh, 2009; Wood et al., 2002; Manuj & Mentzer, 2008; Vidal & Goetschalckx, 1997, 2001) and increase competitive advantage, market share and improve business performance (Asree, 2010; Kale, 2007). When participating in global supply chains, corporates tend to compete to win customers and suppliers with different strategies such as price, product quality, flexibility and ability to make customer satisfy (Babbar et al., 2008; Ghemawat & Hout, 2008).

2.2 Global Supply Chain Dimensions

The global supply chain links independent enterprises together, each with its own internal structure and organization corresponding to its own characteristics and objectives (Sajadieh, 2009). A simple supply chain consists of a company, suppliers and customers. These extended supply chains contain three groups of members: end-stage suppliers at the beginning of the chain, the most final customers in the final stages of the chain and all the companies that provide forwarding, finance, marketing to other companies in the supply chain (Asree, 2010).

A supply chain consists of vertical and horizontal structures (Douglas et al., 1998). The vertical structure of the chain is calculated by the number of tiers along the chain length, the vertical distance is calculated as the distance from the central business to the final customer. In vertical structure, the previous operations (from an enterprise moving to the material suppliers) are called upstream structures; and the later activities from an enterprise that moves the product out to the customer are called downstream structures (Douglas et al., 1998). The horizontal structure of the chain is calculated by the number of the organization of enterprises by tier allowing the identification of the central businesses of the chain. In many chains, customers perceive the central business through the brand of the chain product, although the firm does not perform its production function nor does it have large fixed assets (Douglas et al., 1998).

3. Research Methodology

3.1. Research sample

Vietnamese textile and apparel enterprises are the key enterprises of the Vietnamese economy, contributing about 20% to GDP annually and creating jobs for nearly 3 million workers, accounting for about 20% of the labor force of the country. Therefore, promoting the textile and garment industry development is essential, both helping economic growth and reducing unemployment as well as improving the people’s lives. The research sample is a very important factor to ensure the quality of the research (Hair et al., 2014). In this research, we select textile enterprises to be members of the Textile Association (2018), because these enterprises are listed in the list of textile enterprises released in 2018. We selected these enterprises because of reliable origins while other lists of textile enterprises given by Virac, BIDV, etc. have different and informal figures. Based on the enterprises in the list of Vietnamese textile enterprises, (2018), we use the random sampling technique to select 680 enterprises as the target sample, then we proceed to send a survey through the Textile Association to 680 enterprises in the target sample. After 3 months of collecting data by mail, email and directly, we obtained 589 survey forms. After screening the data, 529 forms were valid and used for data analysis and research hypotheses verification.
3.2. Data analysis techniques

We use Excel 2016, SPSS 22 and Smart PLS 3.0 software for data analysis. The survey forms are gathered into Excel spreadsheet and then imported into SPSS for reliability analysis and EFA discovery factor analysis. After that, we put the data that met the initial conditions on reliability and EFA into Smart PLS software to test research hypotheses.

The analytical process is as follows:

Step 1: Cronbach’s Alpha: Total correlation coefficient > 0.3; Cronbach’s Alpha value: > 0.6 (Nunnally & Burnstein, 1994; Nunnally, 1978).

Step 2: EFA: KMO value is in the range (0.5; 1); and Sig value: <0.5; Load factor: > 0.5; Accumulated variance: > 50% (Nunnally & Burnstein, 1994; Henseler & Chin, 2010).


1. Total reliability (CR): ≥ 0.7
2. Convergent value:
   - External load coefficient of the observed variable (normalized) ≥ 0.7;
   - Extract variance value (AVE): ≥ 0.5
   - Coefficient Rho_A: > 0.7
3. Discrimination value: The top coefficient is larger than the correlation coefficients in the same column (Fornell - Larcker matrix coefficient).
4. Multicollinearity (Variance Inflation Factor - VIF) <5: no multicollinearity phenomenon;
5. Model compatibility with market data:
   - SRMR coefficient: <0.082; (acceptable if less than 0.12);
   - d_ULS coefficient: <95%;

Step 4: Evaluation of the internal model evaluation: The evaluation criteria are based on the research of Hair et al. (2014, pp. 456)

1. Determination coefficient (R²): Based on the research context to determine the acceptable level;
2. Assessment of the impact level (f²):
   - Weak impact: f² = 0.02
   - Medium impact: f² = 0.15
   - Strong impact: f² = 0.35
3. Estimation of path factors: Evaluating meanings and reliability intervals
4. Prediction of relevance Q²: Using Blindfolding:
   - Weak prediction: Q² = 0.02
   - Medium prediction: Q² = 0.15
   - Strong prediction: Q² = 0.35
The structure of the proposed research model is given in Fig. 1 as follows,

Where the variables are defined as follows,

Global supply chain management (GSCM): Global supply chain management is the activities that control the procurement, production and supply of textile products on the world market. To measure the amount of GSCM we based on 5 aspects measured by 25 items developed from research by Tan et al. (2002), Tan (2001) and Waller et al. (2000). The scales are measured using a 5-point Likert scale of 1 to 5, which is distributed from strongly disagree and strongly agree. Competitive advantage (CA) is the extent to which an organization is able to create a defensible position over its competitors. Competitive advantages include customer loyalty, employee satisfaction and business reputation and this includes 12 items. The item scales are five-point Likert type scales with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5=strongly agree, 6=not applicable. These scales were developed from research by Saeidi et al. (2015).

Organizational performance (OP) is an enterprise's performance measured on both financial and non-financial aspects. Financial and non-financial efficiency scales were developed from studies of Rondeau et al. (2000); Stock et al. (2000) and Karimi & Rafiee (2014). The performance is measured by 8 items measuring financial and non-financial performance compared with the previous year as measured by a 5-point Likert scale: from 1 to 5 respectively representing significant decrease to significant increase.

Research hypotheses

H1: Global supply chain management has a positive direct impact on Organizational performance.

H2: Competitive advantage including Corporate Reputation, Customer loyalty and Employee Satisfy has a full intermediary role in the relationship between Global supply chain management and Organizational performance.

4. Research results

The results of reliability analysis and EFA show that all factors satisfy the analysis conditions except GSCM items 2,4,7 and OP 2 with Cronbach's Alpha coefficient <0.6. Thus, they are excluded from the research model.

Next we evaluate the scale model with the following results:
Table 1
Construct Reliability and Validity

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach's Alpha</th>
<th>rho_A</th>
<th>Composite Reliability</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate reputation</td>
<td>0.920</td>
<td>0.920</td>
<td>0.920</td>
<td>0.697</td>
</tr>
<tr>
<td>Customer loyalty</td>
<td>0.838</td>
<td>0.841</td>
<td>0.838</td>
<td>0.634</td>
</tr>
<tr>
<td>Customer relationship</td>
<td>0.911</td>
<td>0.911</td>
<td>0.911</td>
<td>0.672</td>
</tr>
<tr>
<td>Employee satisfy</td>
<td>0.945</td>
<td>0.947</td>
<td>0.944</td>
<td>0.773</td>
</tr>
<tr>
<td>Global supply chain management</td>
<td>0.981</td>
<td>0.981</td>
<td>0.981</td>
<td>0.668</td>
</tr>
<tr>
<td>Level of information sharing</td>
<td>0.898</td>
<td>0.898</td>
<td>0.898</td>
<td>0.638</td>
</tr>
<tr>
<td>Organizational performance</td>
<td>0.949</td>
<td>0.950</td>
<td>0.949</td>
<td>0.650</td>
</tr>
<tr>
<td>Postponement</td>
<td>0.872</td>
<td>0.872</td>
<td>0.872</td>
<td>0.694</td>
</tr>
<tr>
<td>Quality of information sharing</td>
<td>0.928</td>
<td>0.928</td>
<td>0.928</td>
<td>0.682</td>
</tr>
<tr>
<td>Strategic supplier partnership</td>
<td>0.910</td>
<td>0.911</td>
<td>0.910</td>
<td>0.629</td>
</tr>
</tbody>
</table>

The results show that the indices meet the conditions under the guidance of Henseler et al. (2015).

Table 2
Discriminant Validity (Fornell-Larcker Criterion)

<table>
<thead>
<tr>
<th></th>
<th>Corporate reputation</th>
<th>Customer loyalty</th>
<th>Customer relationship</th>
<th>Employee satisfy</th>
<th>Global supply chain management</th>
<th>Level of information sharing</th>
<th>Organizational performance</th>
<th>Postponement</th>
<th>Quality of information sharing</th>
<th>Strategic supplier partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate reputation</td>
<td>0.835</td>
<td>0.221</td>
<td>0.796</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer loyalty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer relationship</td>
<td>0.450</td>
<td>0.185</td>
<td>0.820</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee satisfy</td>
<td>0.236</td>
<td>0.360</td>
<td>0.164</td>
<td>0.879</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global supply chain management</td>
<td>0.457</td>
<td>0.211</td>
<td>0.012</td>
<td>0.181</td>
<td>0.818</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of information sharing</td>
<td>0.470</td>
<td>0.240</td>
<td>0.010</td>
<td>0.193</td>
<td>0.038</td>
<td>0.799</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational performance</td>
<td>0.513</td>
<td>0.282</td>
<td>0.394</td>
<td>0.339</td>
<td>0.400</td>
<td>0.432</td>
<td>0.806</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postponement</td>
<td>0.431</td>
<td>0.221</td>
<td>0.067</td>
<td>0.169</td>
<td>0.016</td>
<td>0.022</td>
<td>0.390</td>
<td>0.833</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of information sharing</td>
<td>0.461</td>
<td>0.222</td>
<td>0.188</td>
<td>0.204</td>
<td>0.021</td>
<td>0.026</td>
<td>0.398</td>
<td>0.194</td>
<td>0.826</td>
<td></td>
</tr>
<tr>
<td>Strategic supplier partnership</td>
<td>0.474</td>
<td>0.197</td>
<td>0.020</td>
<td>0.172</td>
<td>0.041</td>
<td>0.049</td>
<td>0.394</td>
<td>0.037</td>
<td>0.030</td>
<td>0.793</td>
</tr>
</tbody>
</table>

Discriminating value: The top coefficients that are larger than the correlation coefficients in the same column (Fornell - Larcker matrix coefficient) have satisfied the condition as suggested by Henseler et al. (2015). Research data has no Multicollinearity phenomenon, all items have (VIF) <5. In addition, SRMR: 0.065 <0.082; The coefficient d_ULS: <95% that proves the data are consistent with the research model.

Table 3
Model fit

<table>
<thead>
<tr>
<th></th>
<th>Saturated Model</th>
<th>Estimated Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRMR</td>
<td>0.050</td>
<td>0.056</td>
</tr>
<tr>
<td>d_ULS</td>
<td>3.767</td>
<td>4.573</td>
</tr>
<tr>
<td>d_G</td>
<td>0.868</td>
<td>0.889</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>698.238</td>
<td>799.683</td>
</tr>
<tr>
<td>NFI</td>
<td>0.856</td>
<td>0.853</td>
</tr>
</tbody>
</table>
To evaluate the structure model, this paper conducts the test with sample size Bootstrapping $N = 5000$ (Henseler et al., 2015). With $p$-value $< 1\%, 5\%$, and $10\%$, the proposed hypotheses are considered to be statistically significant at the 99%, 95% and 90% reliability levels. The result is as follows:

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig2.png}
\caption{Bootstrapping results}
\end{figure}

The results in Fig. 2 show that GSCM has a positive direct impact on OP with an impact level of 0.178 at the 1% significance level ($P$-value $= 0.000$), which means that Hypothesis H1 is supported. Global supply chain management activities directly impact the performance of an enterprise. The better enterprises implement GSCM, the better their business performance is. To examine the mediating role of competitive advantage including Customer Loyalty, Employee Satisfaction and Corporate Reputation, we follow the four steps suggested by Hair et al. (2014). Step 1, GSCM has a direct impact on OP and has been satisfied in Hypothesis H1. Step 2 is that GSCM has a direct impact on statistical significance of intermediate variables. Fig. 2 shows that this is satisfied with the impact coefficient of 0.211; 0.181 and 0.457 and both are significant at the 1% level ($P$-value $= 0.000$). Step 3: Intermediate variables have direct impacts on OP dependent variables. Fig. 2 shows that we can see that all 3 intermediate variables meet the conditions with direct impact coefficient of statistical significance, respectively: 0.180; 0.186; 0.367 and the same at the 1% significance level ($P$-value $= 0.000$). Step 4: For the overall SEM model, the independent variable no longer has any statistically significant relationship with the dependent variable, which means that GSCM no longer has a statistically significant relationship with OP in the resulting model in Fig. 2. However, GSCM still has a direct, statistically significant impact on OP, so intermediate variables do not have an intermediary role in the relationship between Global supply chain management and Organizational performance. The $R^2$ coefficient is 52.6%, which means that the variables in the model explain 52.6% of OP fluctuations. In addition, the $I^2$ and $Q^2$ coefficients are average (0.16 and 0.18).

5. Conclusion

This paper has provided some empirical evidences for a framework that identifies key aspects of GSCM and describes the relationship among GSCM, competitive advantage, and Performance. By using a comprehensive, valid and reliable tool (SPSS 22, Smart PLS 3.0) to evaluate rigorous statistical tests including convergence validity, discriminatory validity, reliability and AVE, this paper has provided empirical evidence to support conceptual statements and it has shown that organizations with a high level of GSCM had a high level of competitive advantage and high organizational performance, which are consistent with the study of Li and Lin (2006).
Today, the competition between groups is shifting from organizations, to supply groups. More and more organizations are adopting GSCM in the hope of reducing supply chain costs and ensuring competitive advantage. This study has supported the notion that GSCM can have a significant impact on competitive advantage and operational efficiency. However, GSCM practices can be influenced by contextual factors, such as the type of industry, size and position of the business in the supply chain, the length of the supply chain, and the type of supply chain. For example, the level of customer relationship practice, measured by customer satisfaction and expectations, may be higher for the company at the end of the supply chain (closer to the consumer). Larger organizations may have higher levels of GSCM practices because they often have more complex supply chain networks that require more efficient supply chain management. The level of information quality can be negatively affected by the length of the supply chain. Information is delayed and deformed as it moves along the supply chain, the shorter the supply chain, the less chance of distortion. Moreover, a higher degree of deferment can be associated with order-based production systems than on-demand production.

Consumers around the world are always more aware of green consumption, interested in the supply chain of goods. They are interested in the composition of the product before buying. Changes in digitization, product value and e-commerce have also changed the global supply chain forcing the textile and apparel industry to change in the direction of association import and sustainable development in the green direction and create global supply chains. Vietnam is the world's third largest exporter of textiles and garments (after China and India) with an export turnover of 36.2 billion USD in 2018. Vietnam has committed to fully implement 17 items of sustainable development goals in the global 2030 Agenda; Joining and approving the Paris Agreement on climate change at COP21 in 2015, the textile and apparel industry will not be an exception in the global strategy of greening the textile supply chain. With the evidence supported by this study, Vietnamese textile enterprises participating and managing the global supply chain will increase their competitive advantage and performance. Since then, this study has helped Vietnamese textile enterprises be more confident in participating in the global supply chain and helping Vietnam's textile and garment industry to grow more and more.

Future research should revise the scales developed through this study since the concept of SCM is complex and involves a network of companies that produce and deliver an end product. Future research may broaden the scope of GSCM practice by considering additional aspects such as geographical distance, logistics integration and supply chain leadership that were not covered in this study. Future research may also examine the relationships/dependencies between aspects of GSCM practices. For example, information sharing may require the establishment of a strategic supplier partnership. Data for the study included responses from unique respondents within an organization that could cause feedback bias to occur. Results must be interpreted taking into account this limit. Using a single respondent may produce some inaccuracies. Future research should find ways to use multiple respondents from each participating organization to enhance the research. Future studies may also examine proposed relationships by incorporating a number of contextual variables into the model, such as organizational size and supply chain structure as moderator variables in the model. It would be also interesting to investigate how GSCM practices differ between organizational sizes. It will be interesting to consider the impact of supply chain structure (supply chain length, organizational location in the supply chain, channel structure, etc.) in the relationship between GSCM and OP.

References


