

# Uncertain Supply Chain Management

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## The impact of supply chain practices on performance through supply chain integration in textile and garment industry of Vietnam

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### ABSTRACT

This paper is intended to evaluate intermediary role of SCI in the relationship between supply chain management practices (SCMP) and supply chain performance (SCP) and, at the same time, to examine the regulatory role of firm size and transformational leadership in this relationship. The research is conducted on 536 Vietnamese textile and garment enterprises and the results show that SCI had a complete intermediary role in the relationship between SCMP and SCP. Additionally, Size and Transformational leadership also play statistically significant regulatory role in the relationships between SCMP and SCI as well as between SCMP and SCP. Accordingly, it is recommended that enterprises should implement SCMP well to improve the effectiveness of SCI and SCMP, contributing to sustainable development and ensuring requirements of global supply chains.

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## 1. Introduction

Currently, Vietnam is increasingly integrating comprehensively with countries in the region and around the world. During the two years of 2018 and 2019 alone, there have been many trade agreements entered into such as CPTPP, EVFTA, etc., which have created many opportunities as well as challenges for Vietnam when being part of the world market and global supply chains. Especially for the textile and garment industry, this is a key industry of Vietnam with the second highest export turnover in the country, creating job for 1/5 of the total labor force of Vietnam.

However, the survey results of the research group show that most of Vietnamese textile and garment enterprises still operate under small scale and tattered production, not complying with the standards on working conditions and origin of materials. In addition, in the context of the US-China trade tensions if Vietnam does not strictly manage the input materials to ensure the origin of goods, it will be subject to very high import and export tax rates, which will affect operational efficiency of enterprises. Therefore, activities of supply chain management play a very important role. In spite of that, in the context of Vietnam - a developing country, the research on this topic is still very limited, especially in Vietnam's textile and garment industry.

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Research on supply chain management is an area to which many researchers around the world have paid attention as these activities can create competitive advantages and improve operational efficiency for enterprises (Azadi et al., 2014; Sabara et al., 2019). Thanks to supply chain management, enterprises can connect with each other, improve conflicts and create a unified playing field for their mutual interests (Zhang et al., 2015).

In previous studies, the relationship between supply chain management practices (SCMP) and supply chain performance (SCP) has been studied a lot, however, there is a lack of evidence for the complex relationship between SCMP and SCP. Particularly, the research examining SCI's intermediary role is still too limited. Previous studies have examined the relationship between SCMP and firm performance only (Veera et al., 2011), or tested the relationship between supply chain integration (SCI) and firm performance (Zolait et al., 2010) without referring to the link between SCMP and SCP through SCI. Notably, almost no author has examined the regulatory role in the relationships between SCMP, SCI and SCP.

To fill those theoretical and practical gaps, this paper aims to examine SCI's intermediary role in the relationship between SCMP and SCP at first. Secondly, it tests the regulatory role of Size and Transformational leadership in the relationship between SCMP and SCI as well as between SCMP and SCP. In addition to the introduction, the paper includes the following parts: Overview and research hypothesis, Research methodology, Research results and Conclusion.

## **2. Literature Review and research hypotheses**

The research is to evaluate SCI's intermediary role in the relationship between SCMP and SCP. Previous studies have shown that SCI has a partial intermediary role in the relationship between SCMP and SCP when surveying 156 electronics companies in Malaysia in the studies by Sundram et al. (2015), Naway and Rahmat (2019). Enterprises implement a set of supply chain management activities to promote collaboration between internal departments and cooperate with other companies from suppliers to customers in the supply chain (Pramatari, 2007). Previous studies have begun to doubt that the relationship between SCMP and SCP is an intermediate relationship, not a direct relationship, which depends on the ability to integrate components and organizations across the supply chain through SCI. Therefore, we propose the below hypotheses:

H<sub>1</sub>: SCI plays a complete intermediary role in the relationship between SCMP and SCP.

H<sub>2</sub>: Size plays a regulatory role in the relationship between SCMP and SCI.

H<sub>3</sub>: Transformational leadership plays a regulatory role in the relationship between SCMP and SCP.

Supply chain integration (SCI): This factor determines the level of integration, integrating supply chain activities between enterprises, suppliers and customers (Flynn et al. 2010). The role of SCI is to mediate between enterprises and customers and suppliers based on production process characteristics and headquarters of enterprises (Naslund & Hulthen, 2012; Setyadi, 2019; Wadhwa et al., 2006). Activities in SCI include: integrating departments and units within enterprises such as transport unit, material purchasing unit and production unit; At the external level, SCI will integrate activities between suppliers and customers in delivery and data flow connection from suppliers to enterprises and their customers (Schoenherr & Swink, 2012). In order to measure SCI, we use four development scales from study of Sezen (2008) and measured by a 5-point Likert scale with a score of 1 indicating "strongly disagree" and 5 representing "strongly agree".

Supply chain performance (SCP): Supply chain performance is an important part contributing to firm performance. Previously, in order to evaluate firm performance, most researchers often use financial efficiency (Hasan et al., 2018). However, in this paper, we aim to evaluate how supply chain management practices impact supply chain performance or efficiency, a small part of firm performance. Moreover, SCP is typically a continuous process in the supply chain and thus the biggest challenge when measuring SCP is to ensure the true performance of the entire supply chain. For that reason, we

measure SCP based on development of the research by Sundram et al. (2015). Measured by 5-point Likert scale as a unit of measurement ranging from “definitely worse” to “definitely better” in relation to their major competitors.

Supply chain management practices (SCMP): Activities or policies of enterprises to manage their supply chains. According to Sandhu et al. (2013), supply chain management activities are established from 7 aspects: Supplier strategic partnership, Information sharing, Information quality, Customer relationship, Agreed vision and goals, Risk and reward sharing and postponement. In this paper, we develop 7 aspects of SCMP measurement developed from the research by Min & Mentzer (2004) and Sundram et al. (2015). Measured by 5-point Likert scale with a score of 1 indicating “strongly disagree” and 5 representing “strongly agree”.

Transformation leadership: This is the leadership style of manager towards the stakeholders’ interests. In order to measure Transformation leadership, we have built 4 items developed from the research by Waldman et al. (2006). Measured by 5-point Likert scale with a score of 1 indicating “strongly disagree” and 5 representing “strongly agree”.

Size: This item is also measured by 5 levels in line with levels of enterprises division of the State of Vietnam in accordance with Circular No. 39/2018/TT-BTC.

### **3. Research methodology**

#### *3.1. Research sample*

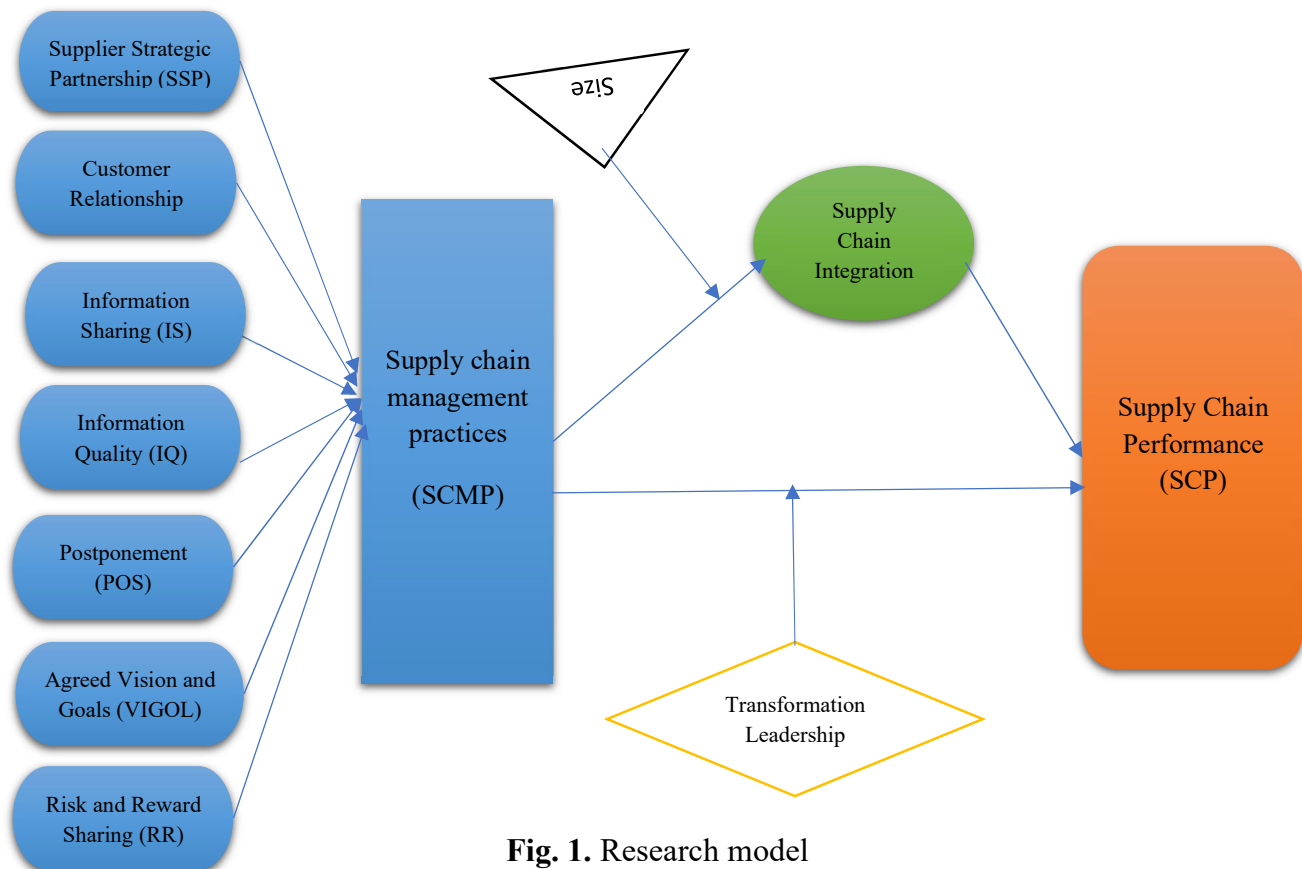
Research sample is Vietnamese textile and garment enterprises in “Vietnamese Textile and Garment Directory, 2018”. On Vietnam’s development path, its textile and garment enterprises play a very important role. These enterprises mainly export their products to world markets such as Europe, America and Japan. The export turnover in 2018 of Vietnamese textile and garment enterprises reached over 36 billion USD, contributing about 20% of the national growth domestic products (GDP) and creating jobs for more than 3 million workers nationwide.

Our research sample includes Vietnamese textile and garment enterprises which are members of Vietnam Textile and Apparel Association and Vietnam Cotton and Spinning Association. We designed the questionnaire after interviewing experts and actual qualitative research at Vietnamese textile and garment enterprises across North, Central and South. Survey forms were sent directly to the members of Vietnam Textile and Apparel Association and Vietnam Cotton and Spinning Association through workshop materials and soft copy via email. After 3 months with the efforts made by the research team together with the help from Vietnam Textile and Apparel Association and Vietnam Cotton and Spinning Association, we have collected more than 600 surveys, which is a very encouraging number. However, after classification and inspection, only 536 valid questionnaires are eligible for data analysis.

#### *3.2. Analysis techniques*

In order to analyze the data, thereby achieving the goal of the research team, we used two popular analytical soft wares including SPSS 22 and Smart PLS 3.0. For SPSS 22, we entered data and checked basic information on the scale of the potential variable. Specifically, we tested the reliability of the scale through Cronbach Alpha and total correlation coefficients. With scales of Cronbach Alpha coefficient  $<0.7$  and the total correlation coefficient  $<0.4$ , they were removed from the research model (Hair et al., 2006). Next we conducted exploratory factor analysis for potential variables: Supply Chain Integration (SCI); Supply Chain Integration (SCI); Supply Chain Performance (SCP). Particularly, the variable of Supply chain management practices (SCMP) is a formative construct and the 2<sup>nd</sup>- order factor, thus it is not suitable for EFA analysis (Hair et al., 2010, 2014). To examine intermediary role and regulatory role, we used bootstrap technique with a sample estimate of 1000 on the software of Smart PLS 3.0.

### 3.3. Research model



**Fig. 1.** Research model

Research variables in the model were developed from the review of previous studies, then we developed and revised based on the qualitative research results to suit the context and culture of Vietnam.

## 4. Research results

Firstly, we tested scale reliability and the results showed that all scales of variables met the conditions for the next analysis except the scales of SCMP4, SCMP7, SCMP13, SCMP17, SCMP 24 and SCMP27 with Cronbach Alpha  $< 0.6$  and thus they were removed before included in the analysis. Like this, SCMP variable had 26 items left qualified for analysis. EFA analysis results show that the independent variables separated into 3 separate variables except the formative construct variable of SCMP. Then, with data tested for reliability, we entered into Smart PLS 3.0 to examine research hypotheses. The results of general reliability test and Discriminant Validity are given in Tables (1-2), respectively.

**Table 1**  
Construct Reliability and Validity

	Cronbach's Alpha	rho A	Composite Reliability	Average Variance Extracted (AVE)
Agreed Vision and Goals (VIGOL)	0.872	0.872	0.872	0.694
Customer Relationship (CR)	0.910	0.911	0.910	0.629
Information Quality (IQ)	0.911	0.911	0.911	0.672
Information Sharing (IS)	0.928	0.928	0.928	0.682
Postponement (POS)	0.898	0.898	0.898	0.638
Risk and Reward Sharing (RR)	0.872	0.872	0.872	0.695
Supplier Strategic Partnership (SSP)	0.871	0.875	0.871	0.575
Supply Chain Integration (SCI)	0.920	0.920	0.920	0.697
Supply Chain Performance (SCP)	0.949	0.952	0.948	0.650
Supply chain management practices (SCMP)	0.982	0.983	0.982	0.666

**Table 2**  
Discriminant Validity Fornell-Larcker Criterion

	Agreed Vision and Goals (VIGOL)	Customer Relationship (CR)	Information Quality (IQ)	Information Sharing (IS)	Postponement (POS)	Risk and Reward Sharing (RR)	Supplier Strategic Partnership (SSP)	Supply Chain Integration (SCI)	Supply Chain Performance (SCP)	Supply chain management practices (SCMP)
Agreed Vision and Goals (VIGOL)	0.833									
Customer Relationship (CR)	0.037	0.793								
Information Quality (IQ)	0.067	0.020	0.820							
Information Sharing (IS)	0.194	0.030	0.088	0.826						
Postponement (POS)	0.022	0.049	0.010	0.026	0.799					
Risk and Reward Sharing (RR)	0.037	0.193	0.089	0.332	0.282	0.833				
Supplier Strategic Partnership (SSP)	0.314	0.123	0.125	0.223	0.164	0.391	0.758			
Supply Chain Integration (SCI)	0.231	0.274	0.250	0.261	0.170	0.296	0.121	0.835		
Supply Chain Performance (SCP)	0.391	0.394	0.394	0.397	0.132	0.363	0.077	0.214	0.806	
Supply chain management practices (SCMP)	0.011	0.040	0.014	0.015	0.036	0.185	0.126	0.263	0.398	0.816

All variables are satisfied, moreover, VIF results show that all values are  $>5$ . Therefore, the variables are not multi-collinear. We then examine relevance of the research data and the research model.

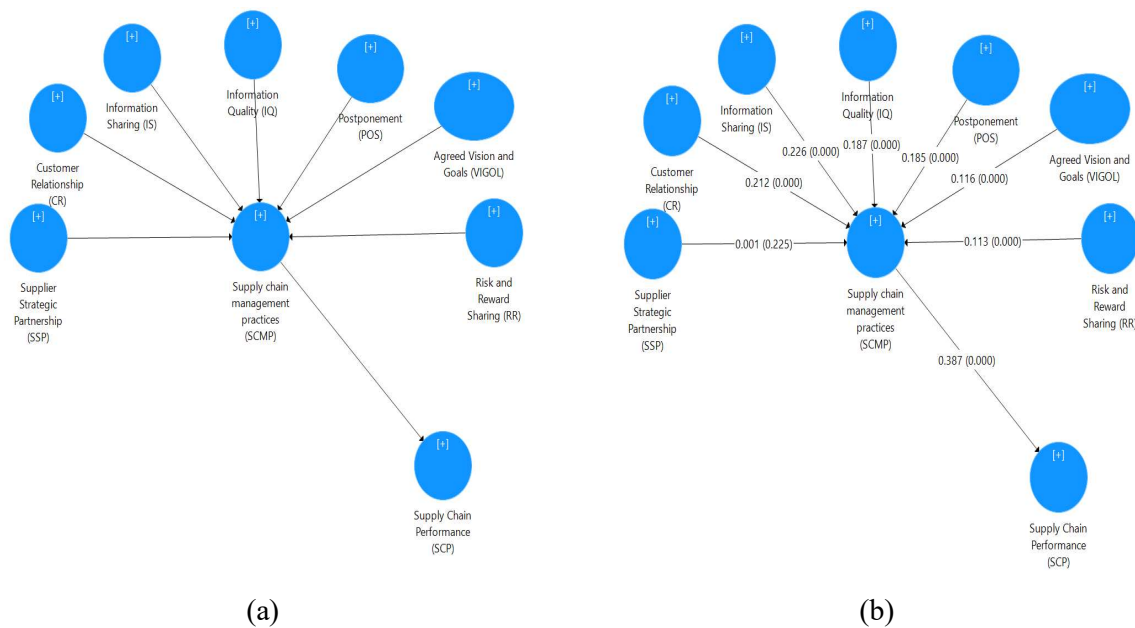
**Table 3**  
Model fit

	Saturated Model	Estimated Model
SRMR	0.056	0.068
d_ ULS	3.127	5.620
d_ G	3.128	3.156
Chi-Square	4,532.81	4,816.36
NFI	0.889	0.901

The results show that the research data is relevant to the research model. From this, we examine the research hypothesis with Smart PLS 3.0.

To examine hypothesis H1 according to Hair et al. (2014), we must go through 4 steps: Step 1: having direct and statistically significant impact between SCMP and SCP. Step 2: having direct and statistically significant impact between SCMP and SCI.

Step 1: having direct and statistically significant relationship between SCMP and SCP

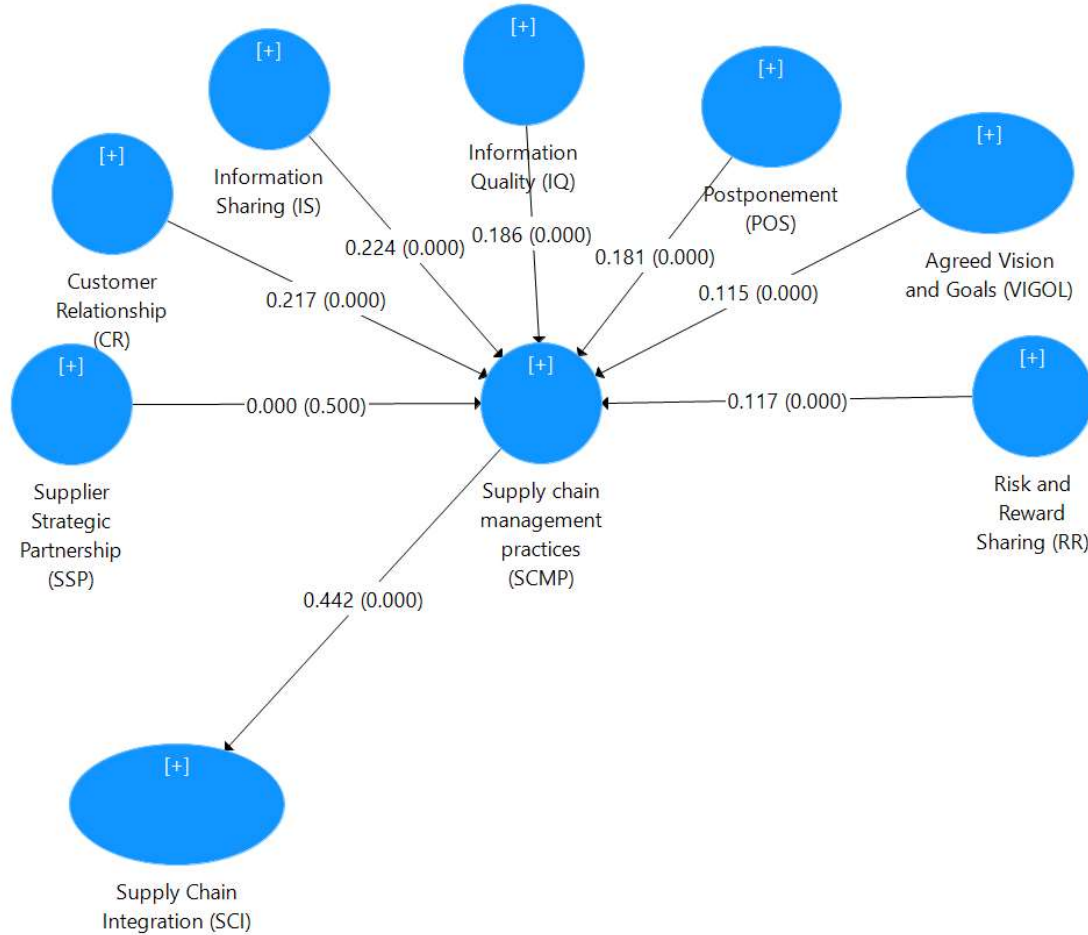


**Fig. 2. a:** direct relationship between SCMP and SCP

**b:** Results of testing the direct relationship between SCMP and SCP

It can be seen from results in Fig. 2b that SCMP has a very strong direct impact on SCP at the impact level of 0.387 and at the significance level of 1% (P-value = 0.000). This means satisfying the conditions to test SCI’s intermediary role in the relationship between SCMP and SCP. However, SSP aspect of SCMP variable does not satisfy the weight condition constituting SCMP variable.

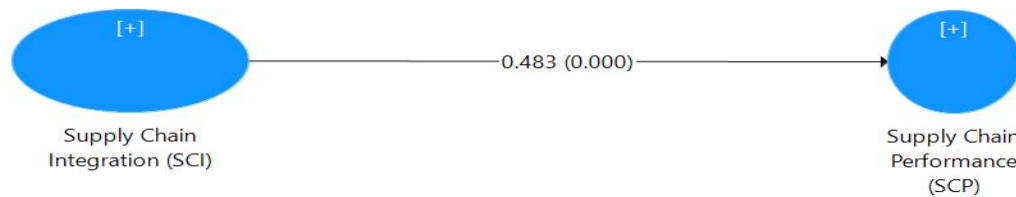
Step 2: Having direct and statistically significant relationship between SCMP and SCI



**Fig. 3.** Results of examining the direct impact of SCMP on SCI

We can see from results in Fig. 3 that SCMP has a very strong impact on SCI with the impact level of 0.442 and the significance level of 1% (P-value = 0.000). Like so, it is qualified to test step 3. However, SSP aspect of SCMP variable does not satisfy the weight condition constituting SCMP variable.

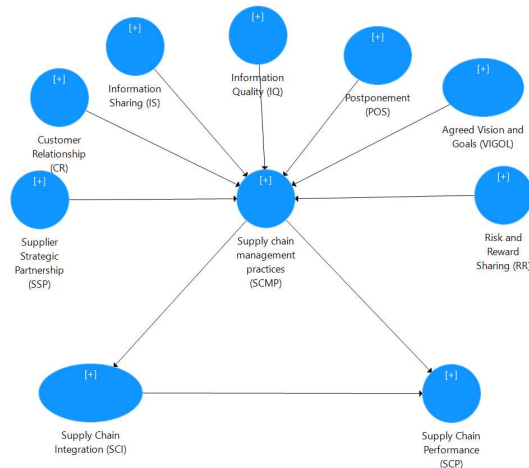
Step 3: Having direct and statistically significant impact between SCMP and SCP



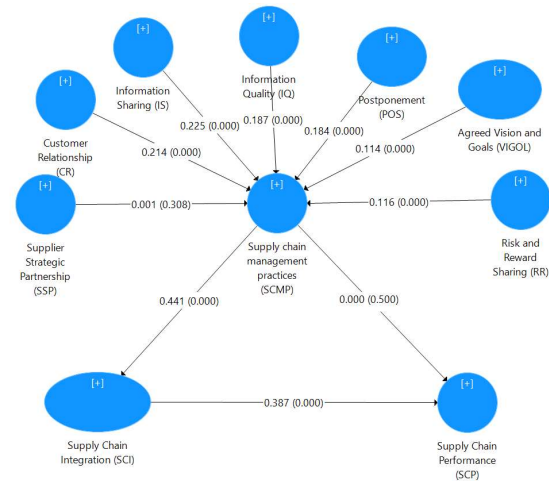
**Fig. 4.** Direct impact of SCI and SCP

Results in Fig. 4 show that SCI has a very strong and statistically significant impact on SCP with the impact level of 0.483 and the significance level of 1% (P-value = 0.000). Briefly, all the first three steps are satisfied. Finally, we examine SCI’s intermediary role as follows:

Step 4: Examining SCI’s intermediary role in the relationship between SCMP and SCP



**Fig. 5.** Model to be examined intermediary role



**Fig. 6.** Results of intermediary role examination (Bootstrap out)

It can be seen from results of bootstrap test in Fig. 6 that in the overall SEM model, SCMP no longer has statistically significant impact on SCP. Therefore, according to Hair et al. (2017), SCI has a complete intermediary role in the relationship between SCMP and SCP. This means that H<sub>1</sub> hypothesis is supported. This result is consistent with the research by Sundram et al. (2015) and Mira et al. (2019).

Hypothesis test results are as follows:

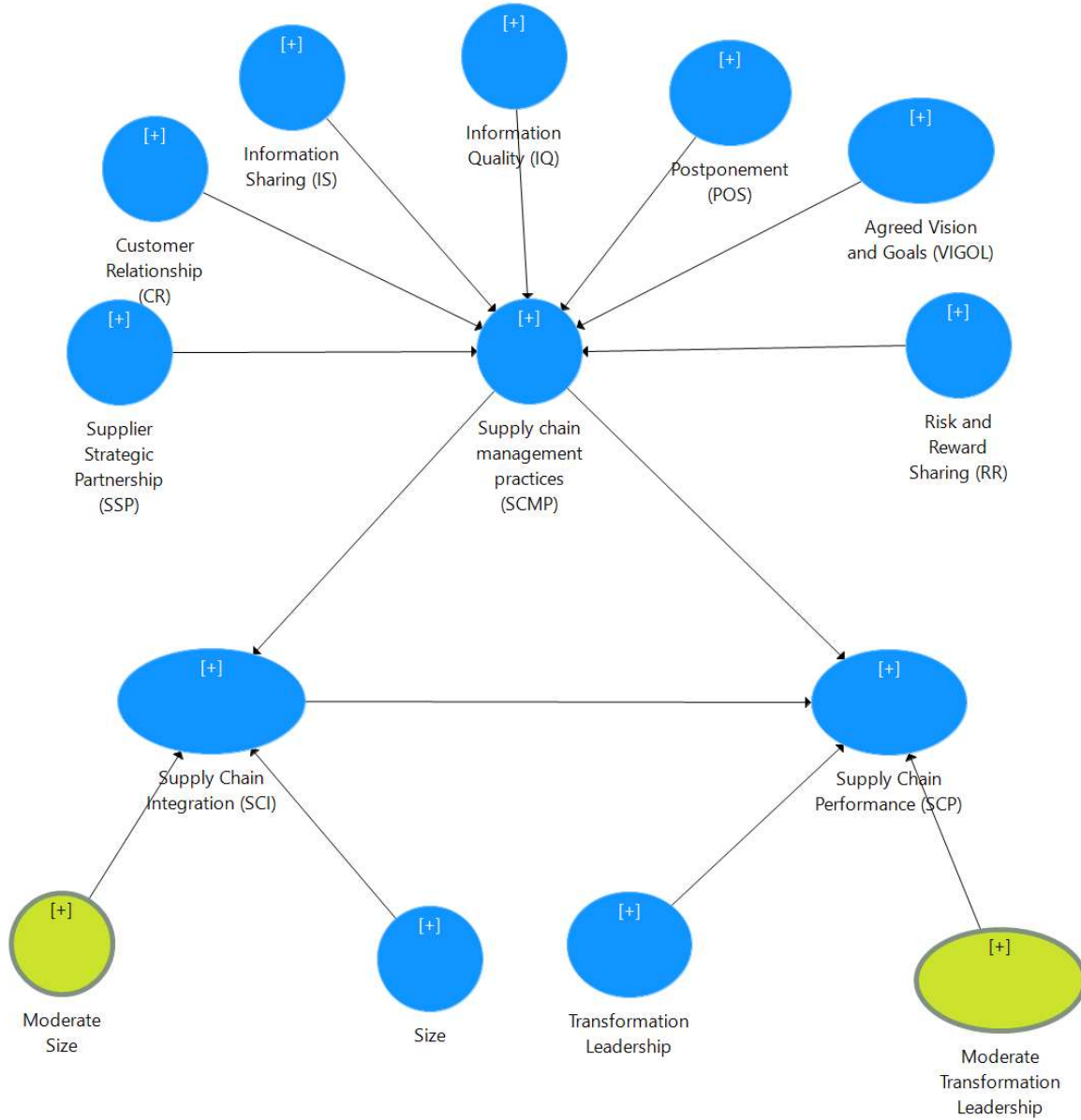
**Table 4**

**Hypothesis test results**

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	Sig.
Agreed Vision and Goals (VIGOL) → Supply chain management practices (SCMP)	0.114	0.114	0.007	15.994	0.000
Customer Relationship (CR) → Supply chain management practices (SCMP)	0.214	0.213	0.005	46.811	0.000
Information Quality (IQ) → Supply chain management practices (SCMP)	0.187	0.186	0.004	42.533	0.000
Information Sharing (IS) → Supply chain management practices (SCMP)	0.225	0.226	0.007	32.898	0.000
Postponement (POS) → Supply chain management practices (SCMP)	0.184	0.185	0.005	40.435	0.000
Risk and Reward Sharing (RR) → Supply chain management practices (SCMP)	0.116	0.116	0.004	27.232	0.000
Supplier Strategic Partnership (SSP) → Supply chain management practices (SCMP)	0.001	0.001	0.001	1.020	0.308
Supply Chain Integration (SCI) → Supply Chain Performance (SCP)	0.387	0.389	0.055	7.015	0.000
Supply chain management practices (SCMP) → Supply Chain Integration (SCI)	0.441	0.445	0.041	0.814	0.500
Supply chain management practices (SCMP) → Supply Chain Performance (SCP)	0.214	0.214	0.060	3.584	0.000

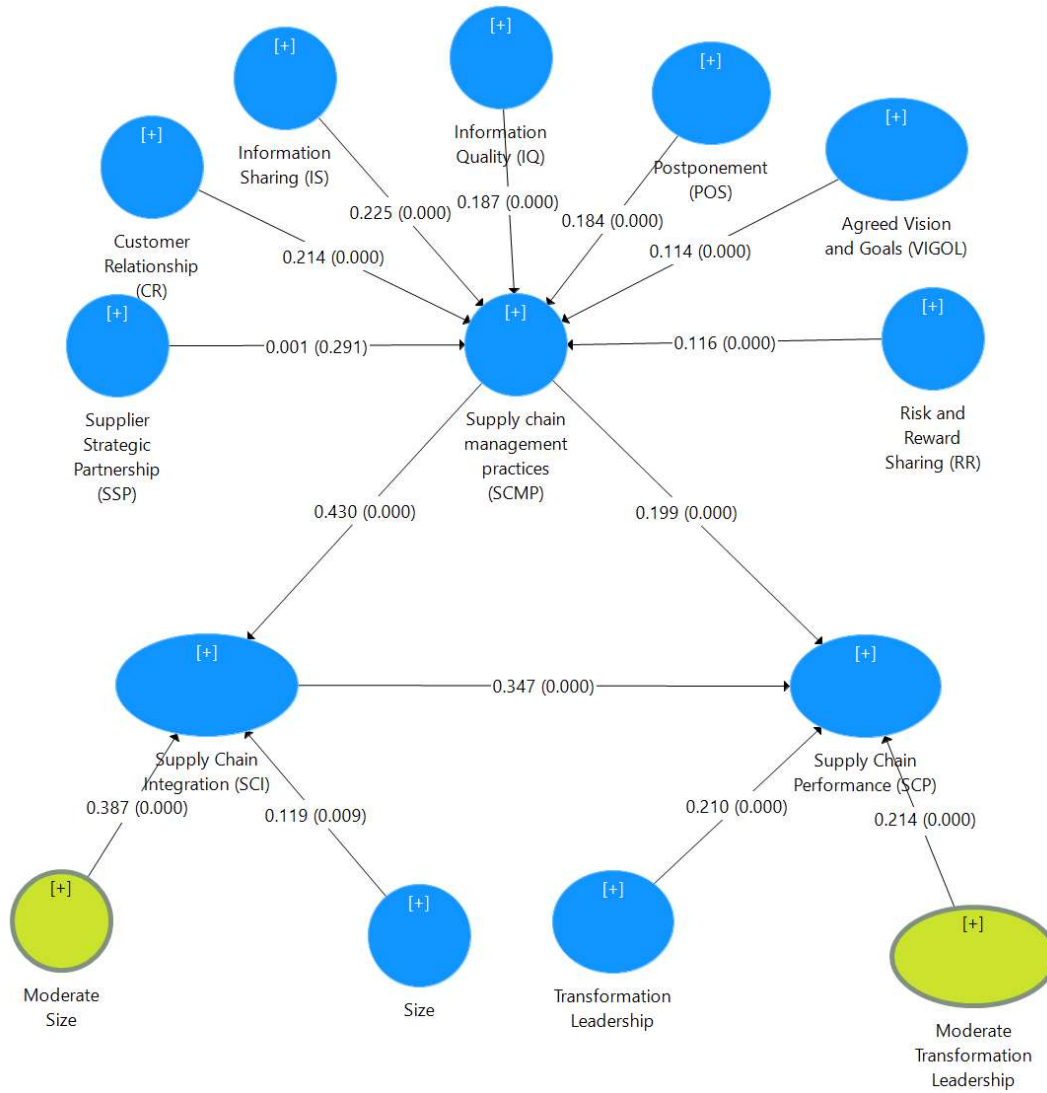
Results reveal that in the overall SEM model, SCMP no longer has statistically significant impact on SCP as in Fig. 6. As a result, H<sub>1</sub> hypothesis is accepted. Next we examine the regulatory role of regulatory variables.





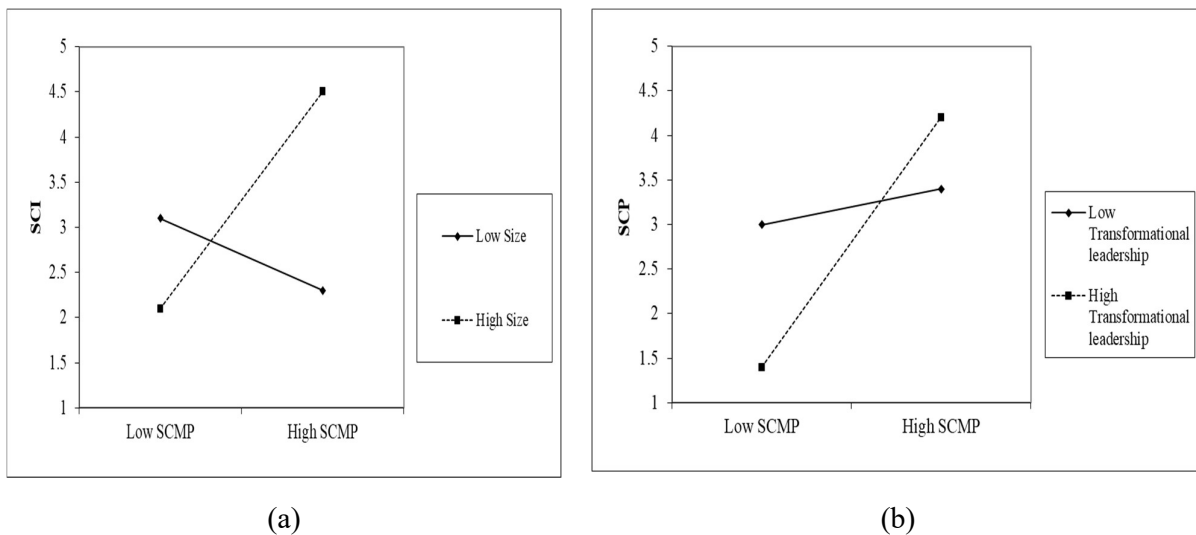
**Fig. 7.** Model to be examined regulatory role

Results of regulatory role examination of Firm size and Transformation leadership are shown in Fig. 8. It can be seen from results of regulatory role examination in Figure 8 that both size and transformational leadership have a statistically significant regulatory role. This means that the larger the enterprises are, the stronger the SCMP will impact SCI activities, whereas the smaller the enterprises are, the weaker SCMP will impact SCI. At the same time, for enterprises with the more the leaders support transformational leadership, the more SCMP activities will have a strong impact on SCP and vice versa, for enterprises with leaders less supportive of transformational leadership, the impact of SCMP on SCP is still in the same direction but weaker.



**Fig. 8.** Results of regulatory role examination of size and Transformational leadership

Results of regulatory role examination are modeled as follows:



**Fig. 9.** Regulatory role of size and transformational leadership

## 5. Conclusion

The paper has presented the positive impacts of SCMP with 6 statistically significant aspects on SCI and SCP, unlike previous studies such as those by Sundram et al. (2015) that all 7 aspects were statistically significant. In the context of Vietnam, especially for garment and textile enterprises, SCI plays a complete intermediary role in the relationship between SCMP and SCP. Data collected from 536 Vietnamese textile and garment enterprises show that supply chain management activities had a strong impact on operational efficiency, especially the efficiency of supply chains. Moreover, Vietnamese textile and garment enterprises mainly operate in the form of order processing, together with the fact that Vietnam has participated in many regional and international trade agreements, therefore, supply chain management plays a very important part to meet requirements on origin of goods and create opportunity to enjoy tariff benefits. Likewise, the research has also revealed that size and transformational leadership had a statistically significant regulatory role in the relationships between SCMP and SCI as well as between SCMP and SCP. This results are consistent with the research of Naway and Rahmat (2019). Vietnamese textile and garment enterprises should attach special importance to SCMP activities towards SCI and SCP as recommended in the research by Daehy et al. (2019). In conclusion, to realize the desire to participate in the world market and become part of the global supply chain in textile and garment industry, Vietnamese textile and garment enterprises must perform SCMP activities towards SCI to improve efficiency of SCP for enterprises and step by step improve operational efficiency towards sustainable development.

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