# What Drives the Innovation Inside, and Integrated Supply Chains of Thai Based Global Traders: A Strategic Management Perspective on Supply Chain Performance

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***Abstract*-The main objective of the current study is the enhancement in literature of SC with untying the association between SC practices, the innovation in CHIN and strategy orientation. SC practices have positive impact of Market orientation. Results are consistent with results of past studies of SC practices development achievement with the use of Market orientation. Contradiction with expectation information reveals that SC practices was not significant and positively related with resource orientation. According the study, a high level of investment for example in IT sector will not be beneficial for supply chain management. This suggestion indicates that managers should not make the excessive investment but have to allocate the resources of organization efficiently. The study has employed the SEM-PLS as a statistical tool to analyze the data collected from the Thai based global firms This study contributed in three aspects of supply chain management. First one is in, integration innovation, strategic management and SCM mainly the use of cross-disciplinary research. Previous studies have presumed that there is positive association among SCPR and innovation in CHIN. Though explanations regarding drivers of innovation in CHIN matters in association not been provided. Whereas we have provided new viewpoint for the explanation how sustained competitive advantage can be created for the firms by innovation in CHIN**

***Keywords:*** *Supply chain, innovation, Global, Thailand*

## 1. Background

The main focus of traditional supply chain is on operand components or practical surveys. According to the literature in the field of innovation in Channel integration (CHIN) and strategy management the theory which was designed for the explanation of SCM accomplishment has not made yet substantial inroads. According to the literature of SCM and supply chain performance (SCPR) can be improved by these two factors innovation in CHIN [1] and strategy orientations. by checking the related literature that how to improve the SCPR as well as the different aspects of market and RO the strategy orientation models have been concurred [2-4]. In the study of SCM RO and market orientation (MO) have received visible consideration equally. A firm's performance can be enhanced with the development of strong MO as in this way form will pay more attention for implementation of firm's response towards customer's needs.

In SCM for the management of business process the other strategies of RO also been applied broadly. How firms can determine their sustainable competitive advantages with the achievement of operant resources addressed in Resource-based view (RBV) [5]. By following the research of Cho, Bonn [5] on RBV it stated that for the improvement in delivery system for ordering cycles, customer needs and supply chain flexibility the manufacturers of U.S are gradually depending on implementing towards operant resources.

Similarly, Dubey, Altay [4] defined in supply chains organizational performance can be improved through organizational competencies and resources which will provide hypothetically sustainable competitive advantage. Unfortunately conflict this research is because of some studies which are overlooking the relationship between SCPR and RO. So, it is difficult for the organizations to know that how they can create efficient supply chain through RO. The recent unembellished business competition in hi tech industry of Taiwan creates the challenge for the firms not only handling price competition and also shifts the burden of inventory control following on the short life cycle of the product. For many

researchers relationship between SCM and innovations in CHIN are different problems [1].

According to the literature in channel associations, innovations mainly focused on improvement of IT through advanced information system. Now researchers are concentrating on creation of value adding innovations and how resources can be used at optimal level because they are interrelated with business performance and supply chains process [1]. It's time for firms to collaborate with other partners by searching the opportunities from outside of their organizations and their firms supply chains are effective and make sure that reactive according to the dynamics of the current market needs.


**Figure 1.** Export partners- Thailand
Source: CIA factbook

Alarifi, Abdel-Aty [6] defined the scope of important collaborative activities of channels integrated system of firm like the scheduling and projecting with members of other channels. In supply chain literature the important parts of forecasting, collaborative planning and activities of replenishment (CPFR) been discussed. According to the study of Artsiomchyk and Zhivitskaya [7], as example they suggest these types of coordination's and associations leads towards complications and challenges which results conflict of incentives between the different players of supply chain. Inspired from the new challenges with facilitating and by enabling the supply chain integration our study will explain the role of information and linked technologies and different problems of collaborations and coordination. As supply chain partners work together for the creation of new customer value so it highlights the status of innovation in CHIN.

## 2. Hypohesis development

Application of marketing perceptions and characterization of organizations culture for producing efficiently and effectively and creating the more value for customers in the firms is known as MO [8]. MO elements are focused on culture of organization which includes systematic and progressive, information collecting concerned with competitors and customers, different activities of coordination and information and a quick response towards changing of market needs actions of competitor [8, 9].

Ziggers and Henseler [9] stated in his study that firm's performance can be improved with the development of it is more important solid MO and by focusing more towards adoption of market needs efficiently before the response of its competitors. While studying the following relationships they revealed the important connection of supplier relationships consolidated and MO through customer awareness by cross functional information sharing. SCM and financial performance can be improved positively by MO. And in organizational level SCM strategy mediate marketing performance and impact of MO, and they also stated that for stronger SCM strategy MO is important ancestor.

By following the existing studies which defines the resemblance in association among SCM and MO for all the participants of supply chain to final customers satisfaction [2], we have assumed that the organization who implement the strategies of MO are expected to show strong SCM performance. Following Hypothesis are purposed with above discussion. Firm's Resource based view forecast how sustainable competitive advantage can be achieved with the control and acquisition, connections of internal resource operations, literature of strategic management explained in resource-based theory as well [10].

According to the literature for efficient enhancement of SCPR RO factors can be used which includes physical and organizational resources and intellectual resources [4]. The firms who have these resources can easily get competitive advantages and can also get sustainable performance in marketing and strategic management [11]. Though researchers of operational management identify the overall importance of resources in supply management function [12], but the outcome of resource orientated strategy still doubtful. As per above discussion this study will confirm the impact of SCPR to resource-oriented strategy. Following evidences leads these hypotheses.

**H1:** MO has significant effect on the SC performance.

**H2:** RO (MO) has significant effect on the supply chain performance.

This study will observe the relationship among innovation in CHIN and strategic orientation. We will make an analysis for the estimation of RO strategic orientation of market with the use of structural equation modeling factors of innovation can be derived. For the identification and response of customer requirements and contribution for attaining the interactive advantages at workplace MO is anxious.

Scholar discussed about the status of logistics incorporation in the feild of marketing channel of management. They argued that by the successful implementation of proper system and with the provision

of detailed examination to SCM Strategy may result the need of integration channel research along with logistics.if supplier at the same time starts the implementation of direct sals channel along with reseller in this way they both can expand their collaboration. We can adopt suppliers market performance as final outcome which will indicate the benefits of upgraded channel functions includes cost adjustments and quality along with numer of transactions [7]. Alarifi, Abdel-Aty [6] also made research that how market performance and channel relationships get effected by supply chain communication systems (SCCS) and innovations surrounding.

By introducing the campaigns for market development and new products there are more chances for outstanding market performance and improvisation in the functionality of market channels at the same time. afterwards the actual development of new products and markets and growth in sales of products can be measure through SCPR [13]. Though Matsuno and Mentzer [8] stated that the firms who are connected with market and want to increase number of buyers they must focus on reduction buyer cost. In the same way Dellaert [14]states there will eb an increase in production at hire cost due to the MO. By following the literature some related studies show a gap of MO for customer innovations, directions in cross-functions and competitors. Related to this Martín-de Castro [15] provide sufficient support that with the rational resources firm can create improvement and innovations. Chiambaretto and Fernandez [16] the hospitals who have associations with collaborative organizations can take the advantages of lop-sided capabilities in cooperation and can increase their business performance with higher innovations in CHIN.

In the CHIN innovation is related with accessibility of new technologies on regular basis. Cross-training for mangers and developing the culture of innovation-promotion are the part of Resource-oriented practices. Wilden, Akaka [17] also discussed about innovations of CHIN and RBV in different areas like inter firm value creation, development of customer centric representations for resources of firms and value proposition. In short, we fully convenience with strategies of RO can increase innovations of CHIN. Based on literature we have made the following hypothesis.

**H 3-6**. In CHIN innovation drivers (value creation, embedding operant, resource, Value constellations, and resource integration) have significant relation with RO.

**H7-10.** In CHIN innovation drivers (value creation, embedding operant, resource, Value constellations, and resource integration) have significant relation with MO

Many studies are available on implication of innovation in CHIN process in SCMand performance. Kumar, Luthra [18] studied that by the integration of supply chains with basic features which makes the relationships more reasonable which includes common belongings of logistics network : producer of intermediate goods, raw material supplier, final goods producer and last one is consumer, which is established with development of information system according to the stander of communication technologies.

Zhang, Van Donk [19] also stated that for performance improvement the most important factor is Supply chain integration. Pekny and Pekna [20], also made a perception that with the integration of supply chain for serving all the customers in retail stores and with the involvement of wholesale prices, subsidized inventory and transfers of payments from manufacturer to retailors virtual store whenever there are excess of stock in retail and comparison of benefits in supply chain integration and supply chain cooperation by analyzing that how supply chains can be synchronized, how optimum criteria's can be calculated for supply-contract, how profit distribution can be made among manufacturers and retail channel partners. Thus, the study has hypothesized

**H11-14**. In CHIN innovation drivers (value creation, embedding operant, resource, Value constellations, and resource integration) have significant relation with supply chain performance.

Shen, Li [21] argued that manufacturers and operation are considered as subsidiary for communication and marketing activities, depending on experimental case studies and theoretical development models researcher purposed a model named as ''segmentation tree'' for the adoption of intensive approach towards SCM which resulted supply chain strategy segmentation, which is constructed on three drivers retail channel, brand and namely product. Though few years back elevated few doubts which seems interesting for analyzing, reviewing and for re-evaluation of current issues in respect of association performance and integration in different survey studies.

Moreover, it seems that possible connections among different characteristics are fully ignored. With respect to construct and measurement there is another issue is that different studies have contrast in level of analysis. Some studies which are survey based on integration reflects relationships and links however the other studies relationship of integration practices with effective links of buyers and suppliers, and performance as organizational variable Adelstein and Barbour [22]. By going through the literature on this subject the condition can be assume that three diverse models of multi-CHIN can be composed. The previous research made an argument four dimensions of innovation are significance to supply chain in process of CHIN: value cocreation reconfiguring value constellations, embedding operant resources, resource integration and value cocreation [23]. Thus, the study has broached the following hypothesis

**H15-18.** In CHIN innovation drivers (value creation, embedding operant, resource, Value constellations, and

resource integration) mediates the relationship between the MO and the supply chain performance.

**H19-22.** In CHIN innovation drivers (value creation, embedding operant, resource, Value constellations, and resource integration) mediates the relationship between the Resource orientation (RO) and the supply chain performance.

## 3. Method and Measurement

Five points Likert scale have been used in questionnaire. for collecting the answers of hypotheses testing. All scales for multi items attained from measures of constructs. The recommendations of Bollen [24] has seen in this study: for the execution of CFA its must for all the dimensions to have minimum two factors. The multi- item scales used in this study all were taken from the past studies.

In this study MO can be measured as: having cross-functional organization, being competitor-oriented and presence of customer focus. For example, we ask from the participants at which degree SCPR of firm can be influenced by MO factors.

*RO: It* is measured in this study, by focusing on physical resources, organizational resources and knowledgeable resources.as an example by asking from the participants differentiate RO factors which can affect the SCPR of firm.

*Co-creation of value:* For the co-creation of value in CHIN innovations drivers states the idea for the creation of satisfying customers by using the different parameters of customer relationships and with focus on delivery and value creation [25]. The adopted scale is taken from Edvardsson, Enquist [26] and Müntener and Baumgartner [23].

*Implanting operant resource.:* This strategy refers towards ‘‘Implanting the operant resources (such as resource, knowledge, skills, core competence, relationships and technology) by enabling organization production efficient and effective for offerings of markets” [27, 28]. The scale items used in this study are taken from Ngo and O'Cass [28]. Item=6. For instance, ask from the applicants in survey how the implantation of embedding operant resources impact the performance of supply chain into managerial activities.

*Resource integration :*It states that marketplace demands the approach of integration and transformation of micro- specialized capabilities into complexed services [29]’’. These items and measures are taken from Müntener and Baumgartner [23]. In questionnaire we asked from applicants SCPR can be affected by reconfiguring of value patterns.

*SCPR:* Relative performance of SCM can be measured through SCPR. The measure used was taken from Leończuk [30]. For instance, question asked from participants you are more concerned about which factor of supply chain and when your company have started the implementation of different activities of supply chain.

## 4. Data Analysis

MM estimation is the next step after carrying out data screening and descriptive analysis. The small sample size and data abnormality are the most common issues that the researchers face while taking organizations as the sample for analysis. The present study was faced with the same problem. For this reason, the study adopted PLS-SEM, since it is an ideal statistical approach, whereas CB-SEM was not seemed to be a good option. Following the suggestion by Hair, Sarstedt [31], 121 sample size was chosen for PLS-SEM estimation. However, a similarity exists between PLS-SEM and CB-SEM i.e. both PLS-SEM and CB-SEM approaches involve two steps estimation. In PLS-SEM, the path model estimation takes place with the determination of the measurement model (MM), followed by the determination of path relations.

The MM evaluation refers to the statistical estimation of the model elements. This is done to confirm the model quality and appropriateness for further application of statistical techniques. Therefore, the study observed measures, such as reliability or internal consistency, and examine the MM through Smart PLS.

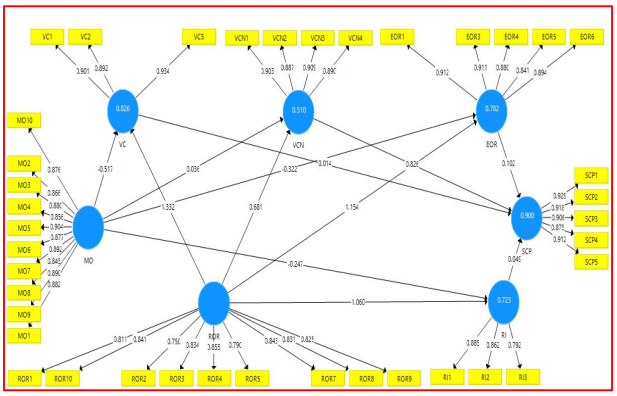

**Figure 2.** measurement model (MM)

Ensuring the reliability of measures is a prerequisite for the constructs’ validity. According to Hosany, Prayag [32] reliability shows the measures’ extent to be free from any measurement errors and are capable of yielding compatible outcomes. The reliability of measures is emphasized because unreliable measures can cause defective effects on the correlation among the measures, resulting in the weakening of the correlations. Therefore, to avoid such errors, a multi-item scaled measurement was proposed, which allows to exclude items from the MM to enhance scale reliability. However, no such measurement errors were witnessed in this study, since each measure has been examined multiple times. According to Hair, Hult [33] internal consistency measure is used for assessing the reliability of items in terms of their homogeneity. The internal consistency determines the extent of a particular scale items to observe the same construct of the model. In addition, Composite reliability

is a measure which is commonly adopted to determine the constructs' reliability or internal consistency. Just as Cronbach alpha (CA), the composite reliability is transcribed in a similar manner. Table 1 shows the result of Cronbach alpha, explaining that all values for reliability are consistent with the threshold level i.e. greater than 0.70 value, thereby confirming the high internal consistency for each construct. According to Lonial and Carter [34], the reliability value is termed satisfactory if it lies within 0.70 to 0.90, contrarily, the reliability value is undesirable if it is higher than 0.90 or 0.95, since it indicates the chance that same phenomenon is measured by majority of the variables.

The average variance extracted (AVE) criterion must also be examined for assessing the MM whose value should be higher than 0.50. On the other hand, Hair, Sarstedt [31] recommended to analyse the criterion such as factor loadings, average variance extracted, and composite reliability, where the acceptable range for factor loadings is above 0.70, AVE>0.50 and CR>0.70. Moreover,Henseler, Hubona [35] suggested that if AVE equals 0.50, then it shows that fifty percent of the manifested variables' variance is on average explained by the latent construct. Convergent validity and discriminant validity help to efficiently observe the construct validity. Besides ensuring the construct's particular item validity, examining the item and cross loadings is a precondition for convergent validity. An item is considered to be a good indicator for measuring a construct if it exhibits high loadings for its own construct, on the other hand, if the item has higher loadings for other model constructs then it is indicative of an item's potential issue.

**Table 1.** Reliability

| | Cronbach's Alpha | rho_A | CR | AVE |
|---|---|---|---|---|
| EOR | 0.933 | 0.936 | 0.949 | 0.789 |
| MO | 0.967 | 0.968 | 0.971 | 0.769 |
| RI | 0.802 | 0.806 | 0.884 | 0.718 |
| ROR | 0.939 | 0.943 | 0.949 | 0.673 |
| SCP | 0.947 | 0.947 | 0.959 | 0.825 |
| VC | 0.894 | 0.897 | 0.934 | 0.826 |
| VCN | 0.920 | 0.921 | 0.943 | 0.805 |

The outer model loading must exhibit value equal to 0.50 or above, to be acceptable, however, less than 0.50 loadings for the outer model is considered to be unacceptable and in order to improve the data quality, items must be excluded from the model. This is usually done be start excluding least loaded items one after another. Table 2 shows the obtained loadings based on the model's construct and indicator. The indicator loadings i.e. 0.749-0.950 show high loadings for their own construct, therefore confirms that the construct validity is achieved for the MM.

**Table 2.** Outer loading

| | EOR | MO | RI | ROR | SCP | VC | VCN |
|---|---|---|---|---|---|---|---|
| EOR1 | 0.912 | | | | | | |
| EOR3 | 0.911 | | | | | | |
| EOR4 | 0.880 | | | | | | |
| EOR5 | 0.841 | | | | | | |
| EOR6 | 0.894 | | | | | | |
| MO10 | | 0.876 | | | | | |
| MO2 | | 0.866 | | | | | |
| MO3 | | 0.880 | | | | | |
| MO4 | | 0.856 | | | | | |
| MO5 | | 0.904 | | | | | |
| MO6 | | 0.877 | | | | | |
| MO7 | | 0.892 | | | | | |
| MO8 | | 0.845 | | | | | |
| MO9 | | 0.890 | | | | | |
| RI1 | | | 0.885 | | | | |
| RI2 | | | 0.862 | | | | |
| RI3 | | | 0.792 | | | | |
| ROR1 | | | | 0.811 | | | |
| ROR10 | | | | 0.841 | | | |
| ROR2 | | | | 0.750 | | | |
| ROR3 | | | | 0.834 | | | |
| ROR4 | | | | 0.855 | | | |
| ROR5 | | | | 0.790 | | | |
| ROR7 | | | | 0.843 | | | |
| ROR8 | | | | 0.831 | | | |
| ROR9 | | | | 0.825 | | | |
| SCP1 | | | | | 0.929 | | |
| SCP2 | | | | | 0.918 | | |
| SCP3 | | | | | 0.906 | | |
| SCP4 | | | | | 0.875 | | |
| SCP5 | | | | | 0.912 | | |
| VC1 | | | | | | 0.901 | |
| VC2 | | | | | | 0.892 | |
| VC5 | | | | | | 0.934 | |
| VCN1 | | | | | | | 0.903 |
| VCN2 | | | | | | | 0.887 |
| VCN3 | | | | | | | 0.909 |
| VCN4 | | | | | | | 0.890 |
| MO1 | | 0.882 | | | | | |

Discriminant validity is slightly different from convergent validity, since it is generally employed to assess the differences or distinct features of the different measuring tools of the model constructs. Under PLS-SEM, it can be assessed with two different measures. Thus, discriminant validity is achieved when each

constructs' square root value exceeds the highest correlation with other model constructs. Therefore, the discriminant validity is observed for ensuring the external consistency of underlying model.

**Table 3.** Validity

| | EOR | MO | RI | ROR | SCP | VC | VCN |
|---|---|---|---|---|---|---|---|
| **EOR** | 0.888 | | | | | | |
| **MO** | 0.796 | 0.877 | | | | | |
| **RI** | 0.871 | 0.787 | 0.847 | | | | |
| **ROR** | 0.871 | 0.781 | 0.842 | 0.820 | | | |
| **SCP** | 0.705 | 0.705 | 0.812 | 0.753 | 0.908 | | |
| **VC** | 0.881 | 0.756 | 0.844 | 0.776 | 0.789 | 0.909 | |
| **VCN** | 0.764 | 0.737 | 0.802 | 0.714 | 0.842 | 0.759 | 0.897 |

The next step after determining the MM is the structural model (SM) assessment. The SM aims to assess the correlation and regression assumptions. There is a five-step procedure presented by Hair, Sarstedt [31] to assess the SM. Firstly, checking for collinearity; secondly, assessing the relationship significance as well as relevance of SM; thirdly, observing $R^2$ and $f^2$; fourthly, assessing the model's predictive relevance i.e. $Q^2$ and; lastly the effect sizes ($q^2$). In addition, the study also determined the mediating effects of variables. The SM estimation is presented in the subsequent sections in detail.

Thus, the SM assessment begins by checking for any collinearity issues. According to Hair, Sarstedt [31] the term collinearity referred as the occurrence of high correlation between the two indicators. The collinearity test results reported that all variables are in line with the threshold level, such as VIF<5 and tolerance level>0.20, and the obtained range for tolerance level is 0.243-0.439, and for VIF it is 2.278-4.122, thus indicating no multicollinearity problem in this study.

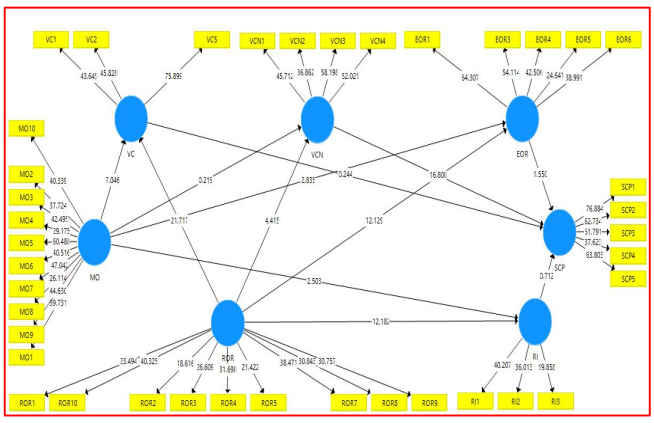


**Figure 3.** structural model (SM)

Afterwards, the significance of the structural relationships and their relevance were assessed. Hair, Sarstedt [31] have observed that analyzing path coefficients help in assessing the hypothesized relationships between the variables. The SM also analyzes the directional relationships, path-coefficients, and the t-values, where path-coefficients are just like the standardized beta-coefficients.

The study also displayed the detailed information i.e. t-values, path-coefficients, and standard errors which form the basis for the acceptance or rejection of hypotheses. The study obtained the t-values following the recommendation of Hair, Sarstedt [31] i.e. through 5000 iterations and performing a bootstrapping procedure. The purpose of taking 5000 bootstrap samples is to ensure empirical sampling distribution for every parameter of the model. Moreover, the S.D of sampling distribution serves as an alternative to empirical S.E for model parameter. Thus, the significance level for this study was determined by performing the 1-tailed test

**Table 4.** Direct relations

| | O | M | STDEV | O/STDEV | P Values |
|---|---|---|---|---|---|
| **EOR -> SCP** | 0.102 | 0.107 | 0.066 | 1.550 | **0.061** |
| **MO -> EOR** | 0.322 | 0.305 | 0.113 | 2.835 | **0.002** |
| **MO -> RI** | 0.247 | 0.234 | 0.099 | 2.503 | **0.006** |
| **MO -> SCP** | 0.022 | 0.012 | 0.150 | 0.146 | **0.442** |
| **MO -> VC** | 0.517 | 0.504 | 0.073 | 7.046 | **0.000** |
| **MO -> VCN** | 0.036 | 0.041 | 0.167 | 0.219 | **0.413** |
| **RI -> SCP** | 0.049 | 0.048 | 0.068 | 0.712 | **0.238** |
| **ROR -> EOR** | 1.154 | 1.139 | 0.095 | 12.129 | **0.000** |
| **ROR -> RI** | 1.060 | 1.048 | 0.087 | 12.182 | **0.000** |
| **ROR -> SCP** | 0.751 | 0.743 | 0.146 | 5.158 | **0.000** |
| **ROR -> VC** | 1.332 | 1.320 | 0.061 | 21.717 | **0.000** |
| **ROR -> VCN** | 0.681 | 0.678 | 0.154 | 4.415 | **0.000** |
| **VC -> SCP** | 0.014 | 0.013 | 0.056 | 0.244 | **0.404** |
| **VCN -> SCP** | 0.826 | 0.823 | 0.049 | 16.808 | **0.000** |

**Table 5.** Mediation

| | O | M | STDEV | O/STDEV | P Values |
|---|---|---|---|---|---|
| **MO -> EOR -> SCP** | 0.033 | 0.032 | 0.024 | 1.352 | **0.088** |
| **ROR -> EOR -> SCP** | 0.118 | 0.122 | 0.077 | 1.541 | **0.062** |
| **MO -> RI -> SCP** | 0.012 | 0.011 | 0.018 | 0.664 | **0.000** |
| **ROR -> RI -> SCP** | 0.051 | 0.050 | 0.072 | 0.714 | **0.000** |
| **MO -> VC -> SCP** | 0.007 | 0.006 | 0.028 | 0.252 | **0.401** |
| **ROR -> VC -> SCP** | 0.018 | 0.017 | 0.074 | 0.247 | **0.403** |
| **MO -> VCN -> SCP** | 0.030 | 0.037 | 0.137 | 0.220 | **0.000** |
| **ROR -> VCN -> SCP** | 0.563 | 0.555 | 0.117 | 4.813 | **0.000** |

The predictive accuracy of the model can be assessed through analyzing coefficients, which is the square root of the correlation of actual and predicted endogenous construct values. The combined effects of latent exogenous variables on the endogenous variables are reflected by the coefficients. Furthermore, the value of $R^2$ shows the predictive accuracy of the model, and it ranges from zero to one, thus, the greater the value the higher the predictive accuracy. If the values for coefficient of determination equals 0.75 then it is considered to be substantial, if $R^2$ equals 0.50 it is considered to be moderate, and if $R^2$ equals 0.25 then it is considered to be weak. Thus, the $R^2$ for the targeted construct exhibits

higher value if there are greater number of paths for the targeted construct. Several researchers seek for the parsimonious model as it requires few exogenous variables for explaining the data.

**Table 6.** R-Square

| | R Square |
|---|---|
| **EOR** | 0.782 |
| **RI** | 0.723 |
| **SCP** | 0.900 |
| **VC** | 0.826 |
| **VCN** | 0.510 |

Subsequently, in order to assess the predictive relevance of SM, the effects size was observed. Since $Q^2$ value reflects the predictive relevance of the model, therefore greater than 0 value for $Q^2$ shows some predictive relevance, and less than 0 value shows that there is no predictive relevance of underlying path model. It can be applied to only single item construct or reflective endogenous variable.

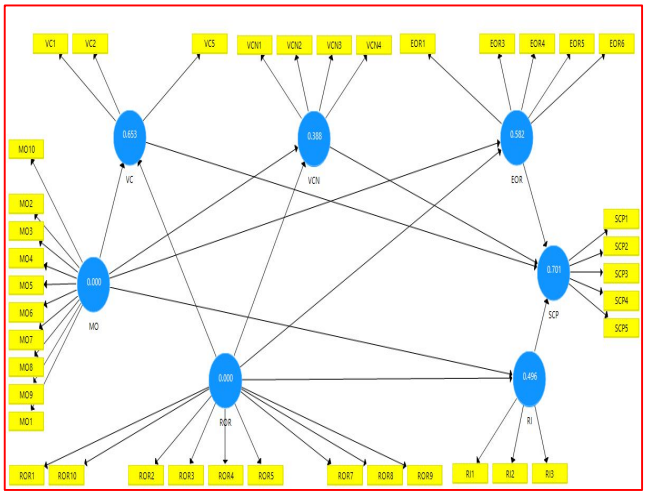


**Figure 4.** Q-Square

Thus, the blindfolding procedure is performed to calculate the $Q^2$ value as presented in Table below.

**Table 7.** Q-square

| | SSO | SSE | $Q^2$ (=1-SSE/SSO) |
|---|---|---|---|
| **EOR** | 1,085.000 | 454.038 | 0.582 |
| **MO** | 2,170.000 | 2,170.000 | |
| **RI** | 651.000 | 327.868 | 0.496 |
| **ROR** | 1,953.000 | 1,953.000 | |
| **SCP** | 1,085.000 | 324.244 | 0.701 |
| **VC** | 651.000 | 225.657 | 0.653 |
| **VCN** | 868.000 | 530.892 | 0.388 |

## 5. Discussion and Conclusion

The basic Purpose of this study is the enhancement in literature of SC with untying the association between SCPR, the innovation in CHIN and strategy orientation. SCPR have positive impact of MO. Results are consistent with results of past studies of SCPR development achievement with the use of MO.

Contradiction with expectation information reveals that SCPR was not significant and positively related with RO. Liang [36]states that a high level of investment for example in IT sector will not be beneficial for supply chain management. This suggestion indicates that managers should not make the excessive investment but have to allocate the resources of organization efficiently.

According to the statistical data cocreation-SCPR calculated by using the AMOS, thus the best trail of this study is RO-value. Bowen [37] presented the view organizational performance can be affected by the value co-creation with RO. Vargo and Lusch [29]also stated that the Customer-centric service culture can be created in firms associated in high-tech industry, which is coordinated with priorities and value perceptions of suppliers which may provide strength to the partnership of supplier and create elasticity in customer response.

This study contributed in three aspects of supply chain management. First one is in, integration innovation, strategic management and SCM mainly the use of cross-disciplinary research.

Previous studies have presumed that there is positive association among SCPR and innovation in CHIN. Though explanations regarding drivers of innovation in CHIN matters in association not been provided. Whereas we have provided new viewpoint for the explanation how sustained competitive advantage can be created for the firms by innovation in CHIN.

It is illustrated in SCM and CHIN literature, by the diver of innovation, we have assumed that with the implantation supply chain activities value of the innovation in CHIN can be improved. Secondly, we have presented different ideas for the improvement of SCPR by using strategy orientation model, and also discuss about market positioning and RO by pushing the different drivers of SCPR and innovation in CHIN.

Thirdly by using SEM analysis calculate the best path. Cocreation of RO-value made effort to provide SCPR by providing the brightness for the execution of CHIN innovation for manager sin supply chain and also contributed in academic links of SCM and integration innovation.

On the basis of current study many recommendations are provided for future research. The appropriateness of innovation in CHIN in supply chain model may tested with survey of standard companies in global supply chain. Secondly this study also investigated about the detection of RO and MO which can allow a firm for the implementation of SCPR.

Additionally, research reveals the transformation among the firms who adopt the different levels of RO and

MO. In future more researches can be made with the consideration of mediating factors resultant to knowledge asset management among SCPR and innovation in CHIN, like knowledge capture, knowledge application, knowledge discovery and knowledge sharing. The findings of this study encounter the mangers and researchers for the reconsideration of how innovation in CHIN and strategic orientation may affect supply chain performance. Drivers of innovation in CHIN might disclose many opportunities in support of supply chain activity in global industry of hi-tech. In supply chain model value of innovation in CHIN is recognized accordingly and must be implemented extensively.

## References

[1] C. Dong, "*Roadway traffic crash prediction using a state-space model based support vector regression approach,"* PloS one, Vol. **14**, No. 4, pp. e0214866, 2019.

[2] G. K. Lilian, O. A. Paul, G. J. Ciumuari, and M. N. Juliet, *"Social Studies Curriculum and Cooperation among Preschool Learners in Nairobi County, Kenya: Addressing Effectiveness of Instructional Methods,"* American Journal of Social Sciences and Humanities, Vol. 4, No. 1, pp. 86-97, 2019.

[3] P. Srivastava, K.N. Iyer, and M.Y. Rawwas, "*Performance impact of supply chain partnership strategy-environment co-alignment,"* International Journal of Operations & Production Management, Vol. **37**, No. 7, pp. 927-949, 2017.

[4] R. Dubey, "*Supply chain agility, adaptability and alignment: empirical evidence from the Indian auto components industry,"* International Journal of Operations & Production Management, Vol. **38**, No. 1, pp. 129-148, 2018.

[5] D. Lynch, R. Smith, S. Provost, T. Yeigh, and D. Turner, *"The correlation between 'teacher readiness' and student learning improvement,"* International Journal of Innovation, Creativity and Change, Vol. 3, No. 1, pp. 1-12, 2017.

[6] K. Malik and F. N. Khan, *"Narcissistic Leadership at Workplace and the Degree of Employee Psychological Contract: A Comparison of Public and Private Sector Organizations in Pakistan,"* International Journal of Economics Business and Management Studies, Vol. 2, No. 3, pp. 116-127, 2013.

[7] A. Mansor, A. Darus, and M. Dali, *"Mediating effect of self-efficacy on self-leadership and teachers' organizational citizenship behavior: A Conceptual framework,"* International Journal of Economics Business and Management Studies, Vol. 2, No. 1, pp. 1-11, 2013.

[8] K. Matsuno and J.T. Mentzer, *Market orientation: reconciliation of two conceptualizations*. in *Proceedings of the 1995 Academy of Marketing Science (AMS) Annual Conference*. Springer, 2015.

[9] G.W. Ziggers and J. Henseler, "*The reinforcing effect of a firm's customer orientation and supply-base orientation on performance,"* Industrial Marketing Management, Vol. **52**, pp. 18-26, 2016.

[10] A. Gunasekaran, "*Big data and predictive analytics for supply chain and organizational performance,"* Journal of Business Research, Vol. **70**, pp. 308-317, 2017.

[11] L. Grimmer, "*The impact of resources and strategic orientation on small retail firm performance,"* Journal of Small Business Management, Vol. **55**, pp. 7-26, 2017.

[12] H. Sung and S. Kim, "*The effect of organizational culture on supply chain management in uncertain environments,"* Asia Pacific Journal of Marketing and Logistics, 2019.

[13] M. Moshtari, *Inter-organizational fit, relationship management capability, and collaborative performance within a humanitarian setting,"* Production and Operations Management, Vol. **25**, No. 9, pp. 1542-1557, 2016.

[14] N. H. Mansor and A. Ilias, *"Goods and services tax , No. GST, pp. A new tax reform in Malaysia,"* International Journal of Economics Business and Management Studies, Vol. 2, No. 1, pp. 12-19, 2013.

[15] G. Martín-de Castro, "*Knowledge management and innovation in knowledge-based and high-tech industrial markets: The role of openness and absorptive capacity,"* Industrial Marketing Management, Vol. **47**, pp. 143-146, 2015.

[16] P. Chiambaretto and A.-S. Fernandez, "*The evolution of coopetitive and collaborative alliances in an alliance portfolio: The Air France case,"* Industrial Marketing Management, Vol. **57**, pp. 75-85, 2016.

[17] R. Wilden, "*The evolution and prospects of service-dominant logic: An investigation of past, present, and future research,"* Journal of Service Research, Vol. **20**, No. 4, pp. 345-361, 2017.

[18] S. Kumar, S. Luthra, and A. Haleem, "*Critical success factors of customer involvement in greening the supply chain: an empirical study,"* International Journal of Logistics Systems and Management, Vol. **19**, No. 3, pp. 283-310, 2014.

[19] X. Zhang, D.P. Van Donk, and T. van der Vaart, "*The different impact of inter-organizational and intra-organizational ICT on supply chain performance,"* International Journal of Operations & Production Management, Vol. **36**, No. 7, pp. 803-824, 2016.

[20] M. Pekny and M. Pekna, "*Astrocyte reactivity and reactive astrogliosis: Costs and benefits,"* Physiological Reviews, Vol. **94**, No. 4, pp. 1077-1098, 2014.

[21] B. Shen, "*Design outsourcing in the fashion supply chain: OEM versus ODM,"* Journal of the Operational Research Society, Vol. **67**, No. 2, pp. 259-268, 2016.

[22] D. Adelstein and M.K. Barbour, "*Improving the K-12 online course design review process: Experts weigh in on iNACOL national standards for quality online courses,"* The International Review of Research in Open and Distributed Learning, Vol. **18**, No. 3, 2017.

[23] O. Müntener and L. Baumgartner, "*Comment on:'Spatially controlled Fe and Si isotope variations: An alternative view on the formation of the Torres del Paine pluton'by Gajos et al.(Contrib Mineral Petrol 171: 93, 2016),"* Contributions to Mineralogy and Petrology, Vol. **174**, No. 6, pp. 54, 2019.

[24] K.A. Bollen, "*A new incremental fit index for general structural equation models,"* Sociological Methods & Research, Vol. **17**, No. 3, pp. 303-316, 1989.

[25] J.N. Sheth and C. Uslay, "*Implications of the revised definition of marketing: From exchange to value creation,"* Journal of Public Policy & Marketing, Vol. **26**, No. 2, pp. 302-307, 2007.

[26] B. Edvardsson, B. Enquist, and M. Hay, "*Values-based service brands: Narratives from IKEA,"* Managing Service Quality: An International Journal, Vol. **16**, No. 3, pp. 230-246, 2006.

[27] S.L. Vargo and R.F. Lusch, "*The four service marketing myths: Remnants of a goods-based, manufacturing model,"* Journal of Service Research, Vol. **6**, No. 4, pp. 324-335, 2004.

[28] L.V. Ngo and A. O'Cass, "*Creating value offerings via operant resource-based capabilities,"* Industrial Marketing Management, Vol. **38**, No. 1, pp. 45-59, 2009.

[29] S.L. Vargo and R.F. Lusch, "*Service-dominant logic 2025,"* International Journal of Research in Marketing, Vol. **34**, No. 1, pp. 46-67, 2017.

[30] D. Leończuk, "*Categories of supply chain performance indicators: An overview of approaches,"* Business, Management and Education, Vol. **14**, No. 1, pp. 103-115, 2016.

[31] Hair, "*Partial least squares structural equation modeling (PLS-SEM) an emerging tool in business research,"* European Business Review, Vol. **26**, No. 2, pp. 106-121, 2014.

[32] S. Hosany, "*Measuring tourists' emotional experiences: Further validation of the destination emotion scale,"* Journal of Travel Research, Vol. **54**, No. 4, pp. 482-495, 2015.

[33] Hair, *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications, 2016.

[34] S.C. Lonial and R.E. Carter, "*The impact of organizational orientations on medium and small firm performance: A resource-based perspective,"* Journal of Small Business Management, Vol. **53**, No. 1, pp. 94-113, 2015.

[35] J. Henseler, G. Hubona, and P.A. Ray, "*Using PLS path modeling in new technology research: Updated guidelines,"* Industrial Management & Data Systems, Vol. **116**, No. 1, pp. 2-20, 2016.

[36] F.H. Liang, "*Does foreign direct investment improve the productivity of domestic firms? Technology spillovers, industry linkages, and firm capabilities,"* Research Policy, Vol. **46**, No. 1, pp. 138-159, 2017.

[37] D.E. Bowen, "*The changing role of employees in service theory and practice: An interdisciplinary view,"* Human Resource Management Review, Vol. **26**, No. 1, pp. 4-13, 2016.

[38] K. Jermsittiparsert and S. Rungsrisawat, *"The Supply Chain Management and Information Sharing As Antecedents of Operational Performance: A Case of SMEs.,"* Humanities and Social Sciences Reviews, Vol. 7, No. 2, pp. 495-502, 2019.

[39] K. Jermsittiparsert and S. Rungsrisawat, *"Impact Strategic Sourcing, Supplier Innovativeness, and Information Sharing on Supply Chain Agility,"* International Journal of Innovation, Creativity and Change, Vol. 5, No. 2, pp. 397-415, 2019.