647

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019

Impact of Network Globalization and Manufacturing Network Integration on Global Supply Chain Performance: Mediating Role of Sustainability

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Abstract--- Globalization has diverted the attention of top executive sitting in big buildings towards global supply chains instead of organizational ones. Manufacturing organizations have also developed some systems like Internal Manufacturing Network Integration (IMNI) and network globalization to survive in global supply chains. However, these systems often need sustainability to perform well in global supply chains. This research has aimed to see the role of IMNI and network globalization in Thailand, producing assembled products, which include machinery, transportation equipment, automotive and electronics industrial sectors. The mediating roles of sustainable production and sourcing have also been analyzed in this regard. As far as methodology is concerned, middle and top-level management has been surveyed through questionnaire who belong from such manufacturing organizations of Thailand that are operating globally. SPSS and AMOS were used to analyze the data for reliability, confirmatory factor analysis and structural equation modeling. Results have shown that both IMNI and network globalization have significant impact on global supply chain performance while mediating roles of sustainability sourcing and production were also significant in this regard. Originality of this study is in the fact that supply chain sourcing and production have not been previously used as mediators between network globalization, IMNI and global supply chain performance.

Key Words: Globalization, Internal Manufacturing Network Integration, Network Globalization, Sustainable Sourcing, Sustainable Production, Supply Chain Performance
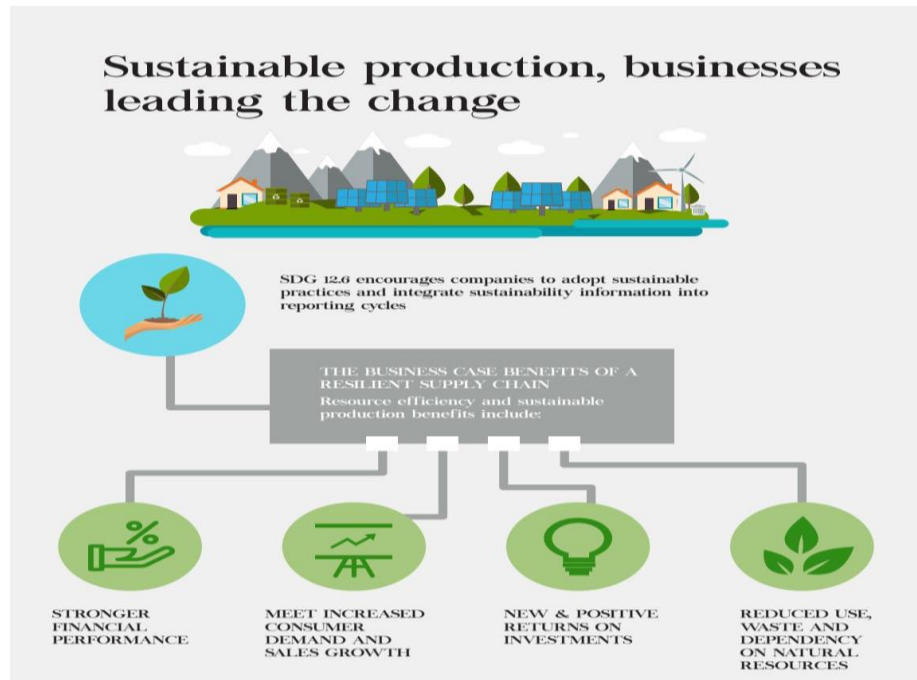
1. Introduction

Supply chain is the collection of people that are involved in a procedure of manufacturing of a new product. This supply chain starts from the suppliers who provide enough raw materials for the required production to the manufacturing company [1]. Them the manufacturing company runs the process of manufacturing the product and converting into final form. This finished product then is transported to the distribution channels who distribute them in the markets and finally these products reach to costumers [2]. For the smooth running of a supply chain, it is very important that all the people involved in it work in collaboration with each other, avoiding conflicts, promoting trust and thus the supply chain performance can be improved [27]. It is very clear that supply chain performance is not dependent on a single person; instead all the actors involved in a supply chain are responsible for its better performance [3; 31].

Network globalization refers to the use of latest technologies by the organizations in the process of globalization in order to expand their work effectively [28]. It provides opportunities to the organizations to spread their circle and diffuse into the global economy for the purpose of better productivity and performance [4]. The global manufacturing networks accumulate the scattered knowledge and use it for the better interest of the organization. There are many factors that may affect the process of network globalization such as size of an organization, demands, expectations, spread of network etc. [5].

648

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019

Internal manufacturing network integration means the use of integrated processes such as employee sharing and common decision making process in order to develop new products and practices for the better performance of any organization [6]. The sharing of information about products and processes among the manufacturing networks enables them to adopt innovative ideas to improve those products and processes. All the information related to the products

or processes of a particular organization must be held and carried carefully as it is very sensitive in nature and the performance of the whole organization depends on it. On the contrary, lack of specialized communication systems result in failure of effective sharing of information about products and processes which ultimately results in failure of innovation adoption [7].

Figure 1: Sustainable Production

Figure 1 shows the basic impacts of sustainable production on an organization. Sustainable production means the use of processes or practices for the manufacture of a product that result in minimum environment damage. These processes involve technologies that contribute in the greening of environment by decreasing pollution and channelizing the industrial wastes [8]. Sustainable production requires proper technology and experts to use it to achieve the purpose of safer environment. On the other hand sustainable sourcing refers to the supply of raw materials from the supplier side which when processed result in minimum environmental disturbance and improvement of environmental performance. Sustainability production comes first and sustainability sourcing come second in this regard. In another context, sustainability production

and sourcing can be measured by the level of adoption on innovation [9]. This innovation requires the latest technical knowledge from outside and applying it in manufacturing processes for better performance of the industry. Sustainable production and sourcing can be obtained by making certain improvements in the supply chain [10].

Sustainability production and sustainability sourcing can be improved by improving internal manufacturing network integration and network globalization. This in turn improves the global supply chain performance. All this process involves the use of new and modern technologies incorporated into organizations [11]. Unfortunately, internal manufacturing network integration and network globalization are not strong enough to improve the performance of supply chain. This problem prevails

649

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019

in all developing and under developed countries of the world leading to inefficient supply chain performances and weak economy. Long term impacts of this problem are not favorable for any country at all. Continuous decrease in sustainability production and sourcing has contributed in this problem so it is very necessary to eradicate this issue by adopting innovation in organizations and making their processes better [12]. Many studies have revealed the importance of global supply chain performance with a few ones showing the impact of network integration and network globalization on supply chain performance. No researches have been conducted to show the mediating role of sustainability production and sustainability sourcing in this regard [13]. A research paper has recommended conducting research about the mediating role of sustainability production and sourcing between the above mentioned variables [14]. The basic objectives of this study are as follows:

- Analyze the significant impact of internal manufacturing network integration on global supply chain performance
- Analyze the significant impact of network globalization on global supply chain performance
- Analyze the significant mediating role of sustainability production between internal manufacturing network integration and network globalization, and global supply chain performance
- Analyze the significant mediating role of sustainability sourcing between internal manufacturing network integration and network globalization, and global supply chain performance

Global supply chain performance means how well the organization is managing the supply chain as an integrated unit by providing customer satisfaction in minimum cost. It is important because its proper integration results in the proper supply of the product to the costumer swiftly and for running the manufacturing processes smoothly. It also aims for the better relations of actors involved in a supply chain [15]. For improvement of global supply chain performance, all people involved in the supply chain must work in collaboration with each other effectively. Significance includes many studies and researches done in this regard which have enabled the organizations to adopt innovations in their processes and improving supply chain performance [12]. Govt. of every country try their best to support these innovations which in turn is beneficial for the whole country.

2. Literature Review
2.1. Organizational Integration and Process Innovation Theory

The conceptual study build on the perspectives of sustainable production and sustainable sourcing is a process of innovation that develops itself on the Organizational Integration and process innovation theory (OIPI) [16] to construct a conceptual as well as theoretical study along with relevant evidences to build a conceptual model of integration. Sustainable production practices at the plant level are significantly and positively associated with globalization and integration of the firm values. This theory depends on the integration value of manufacturing industries, green technologies and social standards that evolves along with the influence of stakeholders who belongs to diverse functional groups of supply chain. In the field of sustainable sourcing and sustainable production, operational management scholars remain focus on the role of the internal and external supply chain in fostering the adoptability action in favor of Sustainability performance (SP) and Sustainability Sourcing (SS). A plant on which SP and SS are working is always available at wide basis that study about the firm-wide manufacturing network. Moreover, further abilities of SP whose characteristics can describe the positive and negative effect that develops a concept of working regarding sustainability-related innovations. The network of globalization promotes the OIPI theory that circulates the cycle of sustainability production and sustainability development with the out sourcing traffic that cause a significant increase in the enterprise network traffic at global level. In different countries of the world and its emerging market are based on the breed of well-developed infrastructure, well developed manufacturing sectors, sustainable product productions to have a global connectivity on a local/regional scale. The impact of globalization on wide-spread networks usually depends on the availability of resources to promote network globalization [30], however large number of

financial institutions is required to meet the need of network globalization and to maintain their sustainability at production level and sourcing level. Network globalization shows it performance in every relevant department, especially manufacturing sector of firms and organizations, because network of globalization is also known as the 'age of information' that develops with time and whose impact triggers the affectivity of sustainable production, development and sourcing.

1. Internal Manufacturing Network integration Relationship with Supply Chain performance

Studies suggest [17] that IMNI depends on the abilities and capabilities of SCP at market level, organizational level and at the level of installing green plants to promote sustainability production and sustainability development. With the help of small action and make big difference programs that is used by different firms and industries to promote the cost efficiency techniques that will further enhance the value of IMNI along with the supply chain resilience. To develop novel and most sustainable productions, practices at small and large level both are considered as the source of bringing change due to the integration of SCP to turn simple ideas into major projects. Companies like BMW and Unilever that are amongst the most famous firms in the world, which works on the processes and techniques of sustainable sourcing guidelines in their manufacturing sector, to meet the customer demands and regularly provide directions to individual plants to resourcefully collaborate with the supplier orientation and needs. Suppliers on the other hand produce a positive impact on the society and the environment to challenge the complexities faced by globalization network and its manufacturing network. Society and the natural environment can work hand in hand to support the concept of sustainable development and sustainable sourcing [29]. IMNI benefits the behavior and function of SCP, working under the platform of OIPI theory. Thus, the following hypothesis is proposed:

H1: Internal manufacturing network integration has a significant impact on Supply chain performance.

2. Network Globalization Relationship with Supply Chain performance

According to studies [18] network globalization plays an essential role in dealing with SCP and SCM at global level. Supply chain usually focuses on

exploring innovative methods to reduce operating costs, production costs and green lean terms. To sustain the growth rate of the market, manufacturing management and teams rely on the ability of supply chain resilience which wide spread due to the impact of network globalization system. NG focuses on building a smarter supply chain to overcome any emerging or developing challenges and problems. Opportunities that emerge from the sustainable processing and sustainable sourcing are handled with care and concern by the implications of NG in the market orientation as well as business. There might be factors that emerge from the rising tide of network globalization including network uncertainties to deal efficiently with business complexities. Many companies expect latest function and practices from SCP to manage wide globalization of networks, therefore NG produce a positive impact on SCP. Thus the following hypothesis is proposed:

H2: Network globalization has a significant impact on Supply chain performance.

3. Mediating Role of Sustainability production between IMNI and SCP

According to the applied theory of OIPI [19], that refers towards the application of sustainability production between the two variables IMNI and SCP. Companies have to obtain Sustainability production and gain competitive advantages to support the efficiency of SCP at market level business production. These companies have to make huge amount of progress in optimizing their operations from a global perspective of knowledge and latest information and technology. To earn huge profits companies have to rely on the idea of SP and SS to evenly distribute the effect of IMNI and SCP. Higher progress of SP can enable the company to achieve high ranks in future market to play a mediating role between the two variables. Thus, the following hypothesis is proposed

H3: Sustainability production has a significant mediating role between the relationship of IMNI and SCP.

4. Mediating Role of Sustainability Production between Network Globalization and SCP

According to past studies [20], that elaborates the aspect of SP with the global expansion of networks due to the compatibility and competitiveness of NG and SCP at the market business level. SP is

responsible for redesigning, rationalizing and optimizing certain global networks with the help of supply chain development, management and resilience. Theory shows the impact of SP on various terms of NG and SCR that works in collaboration. Network globalization gives way to a wide-spread of emerging global markets that will perhaps increase the international trade rates to develop the interdependencies of one organization on another, and one global market on another. The market and global trade trend has evolved partially to maintain the global competition of networks, products manufacturing and quality production of goods and services. This produces a positive impact on the NG which further elaborates the function of supply chain resilience to maintain the sustainability of the global market and global production. Thus, the following hypothesis is proposed:

H4: Sustainability production has a significant mediating role between the relationship of Network globalization and SCP.

5. Mediating Role of Sustainability Sourcing between IMNI and SCP

As per studies [21] sustainability sourcing is responsible for developing a rational relationship between IMNI and SCP. IMNI integrates the effect of global economy and finances on global market which will further drive supply chain management on the variables of productivity, competence and liability. SCP develops certain competitive edge for the company in the coming of highly competitive market. SCP knows how to deal in already established competitive market to gain competitive advantage and to compete with other companies at national or international level. Empirical evidences of OIPI theory defines IMNI as a source of triggering the

effect of SCP, developed from the state or concept of SP. SCP increases the trend rate of trade across the international market, which will gradually causes increase in economic and business environment to conduct more business activities with the help of sustainability sourcing. Thus, the following hypothesis is proposed:

H5: Sustainability sourcing has a significant mediating role between the relationship of IMNI and SCP.

6. Mediating Role of Sustainability Sourcing between Network Globalization and SCP

Network of Globalization depends on the aspects of the international business environment that also refers to the growth of interdependencies between national markets and international business associations. The advancement in political and business modes relies upon the mediator role between network globalization and supply chain resilience. SS [22] can bring about many developments along with various changes in the field of marketing and manufacturing industries, determining the effects of standardization and gaining benefits from minor changes which suits different small and huge business markets. According to studies [23], researchers believe that if companies are standardize even to a minimal extent, then these companies might be void of duplication in local or international market. This prevention of duplication by the companies depends highly on the affectivity of sustainability sourcing that act as a mediating role between network globalization and SCP. Thus, the following hypothesis is proposed:

H6: Sustainability sourcing has a significant mediating role between the relationship of Network globalization and SCP.

652

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019
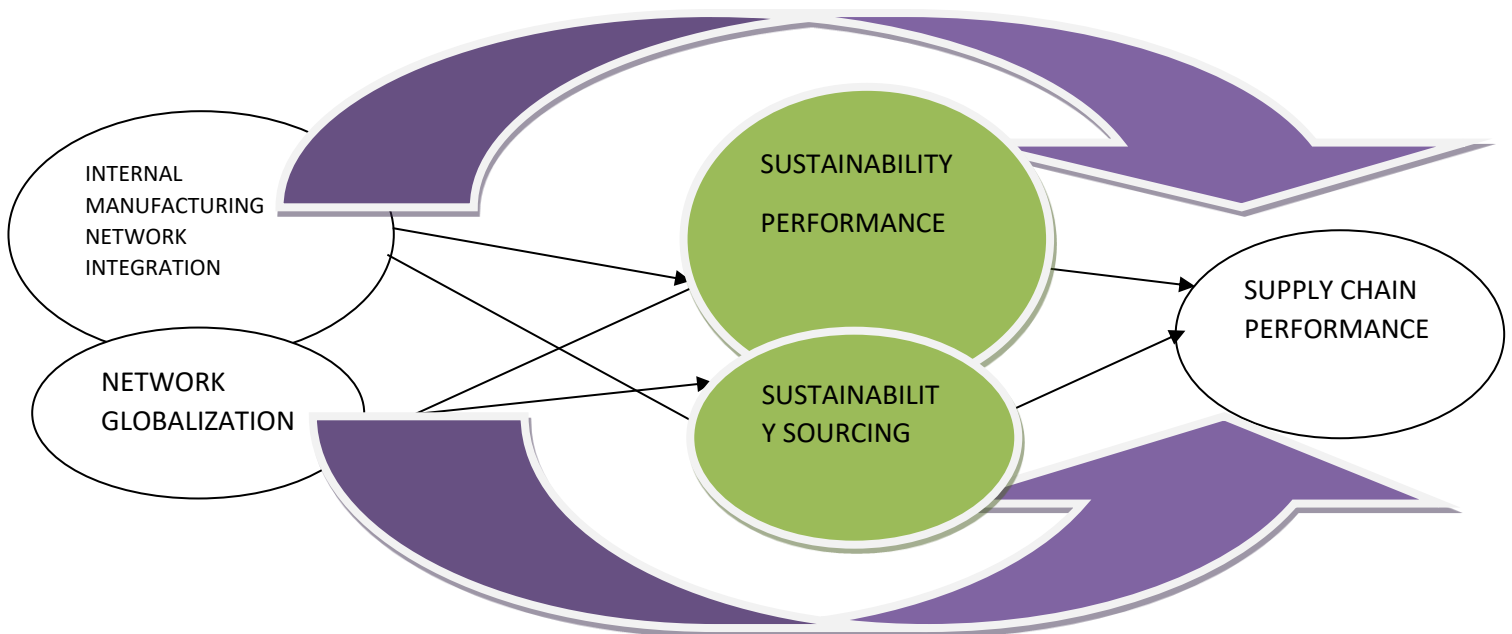
Model:

Figure 2: Model

3. Research Methodology
3.1. Population and Sampling
Research study has been accompanied in order to observed the impact of network globalization and manufacturing network on supply chain performance, with the intervention of sustainable production and sustainable sourcing. To studies the manufacturing and supply chain strategies of the firms which involves in production of assembled products, electronic and automotive industries has been selected as a sample of the study. As, these manufacturing industries highly contributed in economy of Thailand, as most of the vehicles of international brands such as Ford, Mercedes and Volkswagen have been manufactured in Thailand. Respondents must have knowledge about the manufacturing and supply chain strategies of these firms and responded towards all the items of questionnaire in perspective of the whole population. The main issuing point in sampling is the sample size, it has to large enough if the structure equation modeling has been used for evaluation (Hazen et al., 2015). Klein (2015) idea about sample size has been used by researcher in identifying the accurate size. The formula number of questions*10 provided exact figure of sample size.350 questionnaires have been distributed among the respondents, 316 out of 350 has been responded but after discarding the incorrect

responses, researcher considered only 316 valid responses.

3.2. Data Collection Techniques
For collecting primary data from managerial employees, data collection method which has been used by researcher is questionnaire. Questionnaire development procedure has been started with the use of survey instrument by [21], which enables researcher in order to select all the items in accordance to aim of study. A pilot study has been conducted in which 20 employees have been included, those who report that whether there are any difficulties in understanding of items or they can easily respond them. As Thai and English are the two-official language of Thailand companies that's why back translation method has been used by researcher. Firstly, questionnaire written in English language then it converted into Thai language. Self-administered questionnaire and online questionnaire have been used as questionnaire administering techniques for the convenience of respondents.

3.3. Validity, Reliability and Common Bias analysis
Reliability has been assessed by SPSS and criterion used for the assessment states that Cronbach's α and its threshold range is greater than 0.70 because as per

653

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019

(Chin, 1998) its values were strong at 0.75 or above this. AMOS has been used for the assessment of convergent validity and discriminant validity but criteria to examined that are totally different. As criteria for convergent validity involves (1) items loading (λ) which has to be greater than 0.70, (2) composite constructs reliability (CCR), whose value has to be higher than specific limit which is 0.80 and (3) average variance extracted (AVE) and its values has to be higher than 0.50 [11]. For the discriminant validity, criterion has been used for assessment states that square root of AVE has to be greater when compared with all other construct's values [11].

Common bias has been originated as the when same measures have been used for evaluation of dependent and explanatory or independent variables. Respondent has to respond according to nature of variables, some modifications always required in prescribes measures by common rater [22] As in this study, respondent has been used same subjective measures for set of variables such as globalized network, manufacturing network integration, sustainability and supply chain performance that's why risk of common bias has been observed. For reducing the risk of common bias, Harman's one factor test has been used by researcher. This test examined that whether all the constructs have been interpreted by single factor. If 50% of variance accounted for by single factor then there is risk of common bias. According to the results, 86% of variance accounted for by factor solution and 20% of total variance interpreted by single factor. Hence, it has been confirmed that risk of common bias not existed in this study as most of constructs accounted for by different factors.

3.4. Hypothesis Testing

Hypothesis testing is an essential part of methodology as it decided whether hypotheses accepted or rejected. It has been done through structure equation model, which runs on AMOS. Covariance based approach used by AMOS in order to run the diagnostics of SEM. In SEM, structure path model has been analyzed in order to checked standardization of path and to observe the significance of influenced path. On the bases of results obtained through this analysis, acceptance or rejection status of the hypotheses has been reported.

3.5. Measures

IMNI was measured with the scale developed by [13], with the help of five items that were taken on a five-point Likert scale. Then SP and SS were assessed by the scale developed by the researcher [14] and here four items were taken on a five-point Likert scale and were assessed. SCP was measured by a scale developed by [18], four items were taken and measured on a five-point Likert scale. Finally, NG was measured by the scale developed by [19] and five items were taken which were measured on a five-point Likert scale.

4. Empirical Findings:

In order to do some research on supply chain performance, data was collected from the manufacturing sector of Thailand and 316 employees were involved in it. To better use the data, it is required to confirm its authenticity, fitness, normality and validity of data collected. For this purpose, some pre requisite analysis tests are used. The demographics of the employees from which the data was collected is as follows; among the total 316 employees, 129 were males and rest 187 was females. In educational context, 23 employees had graduation degree, 157 had post-graduation degree, 126 employees had done masters and the remaining 10 had other different educational qualifications. Talking about the age of employees from which the data was collected, it was noticed that most of them were very young i.e. 263 employees were having age between 21 years to 30 years. Other than this, 42 employees were 31-40 years old. Number of employees having age from 41 to 50 years was 9 and remaining 2 employees were over 50 years old. Now we will move to pre requisite tests for the analysis of our data.

4.1. Descriptive statistics:

TABLE 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
IMNI	316	1.00	5.00	3.5261	1.12472	-.828	.137
NEGL	316	1.00	5.00	3.4905	1.15746	-.681	.137
SUPR	316	1.00	5.00	3.5498	1.11861	-.759	.137
SUSO	316	1.00	5.00	3.5992	1.08298	-.830	.137
SCPR	316	1.00	5.00	3.4430	1.12560	-.552	.137
Valid N (listwise)	316						

Table 1 (descriptive statistics) shows the absence of any out liar in the data as the highest and lowest values are within the range of 5 points Likert scale. These out liars may disturb the data and result in the disturbance of analysis, so it is necessary that our data must be free of out liars. In addition to that, data is skewed between -1 and +1, which is the threshold range for normality assumption of data, which shows that data is completely normal. From these results, we can conclude that the collected data is completely normal, healthy and fit for doing further analysis.

4.2. Rotated Component Matrix:

Rotated component matrix is the table which shows the values for factor loading for all the indicators involved in our data. Following is the table of rotated components matrix for our data:

TABLE 2. Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
IMNI1				.743	
IMNI2				.798	
IMNI3				.858	
IMNI4				.842	
NEGL1	.798				
NEGL2	.836				
NEGL3	.841				
NEGL4	.861				
NEGL5	.850				
SUPR1			.797		
SUPR2			.837		
SUPR3			.889		
SUPR4			.804		
SUSO1					.791
SUSO2					.847
SUSO3					.816
SCPR1		.851			
SCPR2		.871			
SCPR3		.880			
SCPR4		.888			

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

From Table 2, we can see that all the indicators involved in our data are having factor loading of more than 0.7, which is within the range of threshold. Moreover, we can see that the indicators are in the sequence, which is suitable for our research. In addition to this, we can also observe that in the table of rotation component matrix, there is no problem of cross loading of data. These factors indicate that out data is valid and completely eligible for entering into further analysis.

655

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019

4.3. Convergent and discriminant validity:

This table is used to measure the convergent and discriminant validity of the data we have collected for research purposes.

TABLE 3. Convergent and dicriminant validity

	CR	AVE	MSV	MaxR(H)	SUSO	IMNI	NEGL	SUPR	SCPR
SUSO	0.902	0.754	0.336	0.912	**0.868**				
IMNI	0.926	0.758	0.327	0.960	0.544	**0.871**			
NEGL	0.951	0.796	0.343	0.978	0.580	0.572	**0.892**		
SUPR	0.931	0.772	0.343	0.983	0.485	0.529	0.586	**0.879**	
SCPR	0.937	0.787	0.247	0.987	0.462	0.497	0.356	0.422	**0.887**

Table 3 shows that composite reliability of our data is more than 70% and average variance extracted is more than 70%, which is the perfect range of authenticity of our data. Moreover, the table also shows that out data has loading, which is very different from one another. These factors clearly show that the data we have collected from the employees is valid and reliable for further use.

**4.4. Confirmatory Factor Analysis:**

This is used to check the fitness of our hypothetical model made for research purposes. Following is the confirmatory analysis data:

TABLE 4. Confirmatory Factor Analysis

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	2.112
GFI	Equal or greater .80	.901
CFI	Equal or greater .90	.970
IFI	Equal or greater .90	.970
RMSEA	Less or equal .08	.059

We can see in the table 4, that all current values are in threshold range, such as CMIN/DF value is 2.112, which is less than 3, GFI value is .901 that is greater than .8. Similarly, the values of both CFI and IFI are .970 each which are greater than .90. The last value RMSEA which is .059 is also within the range i.e. less than .08. So these values prove that out model is fit for research. Following is the screenshot of our hypothetical model:

656

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019
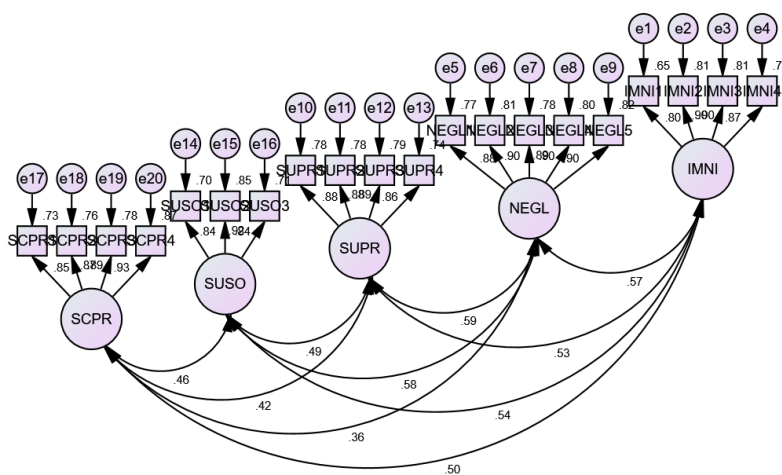
4.5. Structural Equation Modeling:

Structural equation modeling is the regression analysis which is used to confirm the hypotheses we have made for our research.

TABLE 5. Structural Equation Modeling

Total effect	NEGL	IMNI	SUSO	SUPR
SUSO	.398***	.277***	.000	.000
SUPR	.401***	.277***	.000	.000
SCPR	.119*	.395***	.23***	.173**
Direct effect	NEGL	IMNI	SUSO	SUPR
SUSO	.398***	.277***	.000	.000
SUPR	.401***	.277***	.000	.000
SCPR	-.044	.282***	.235***	.173**
Indirect effect	NEGL	IMNI	SUSO	SUPR
SUSO	.000	.000	.000	.000
SUPR	.000	.000	.000	.000
SCPR	.163***	.113**	.000	.000

We can see that in total effect portion, there is significant impact of both internal manufacturing network integration and network globalization on sustainable production, sustainable sourcing and supply chain performance. This means that with one unit increase in NEGL, SUSO will increase 39.8%, SUPR will increase 40.1% and SCPR will increase by 11.9%. in the same way, with the increase of one unit of IMNI. SUSO will increase 27.7%, SUPR will increase at the same rate i.e. 27.7% and SCPR will increase by 39.5%. we can also see that there is significant mediating role of SUSO and SUPR between IMNI AND NEGL, and SCPR. In direct effect portion, we can see that there is insignificant impact of NEGL on SCPR leading to the rejection of this hypothesis. In the last portion, however, indirect effect of NEGL and IMNI on SCPR is significant, so these two hypotheses will be accepted. Following is the screenshot of SEM:

657

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019
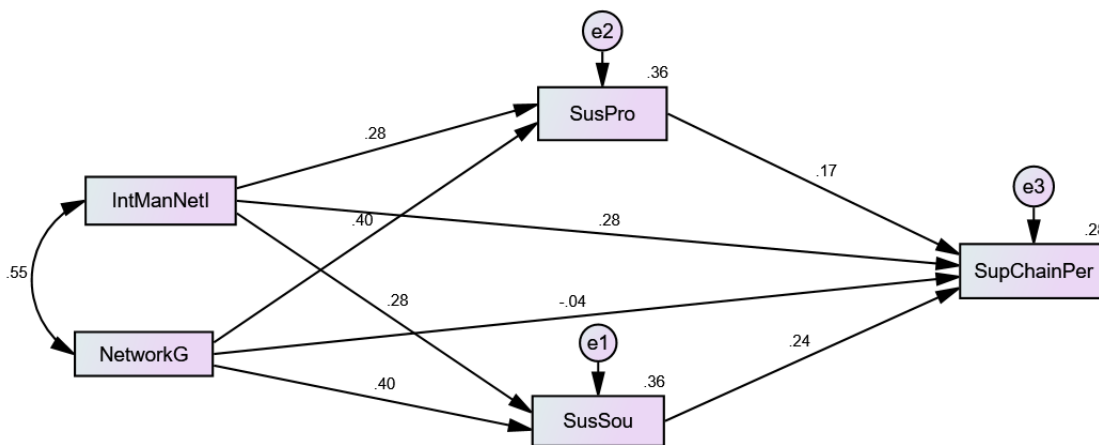
5. Discussion and Conclusion
5.1. Discussion
This study aimed to know about the impact of internal manufacturing network integration (IMNI) on supply chain performance (SCP) and the impact of network globalization (NG) on SCP. This study took sustainability production (SP) and Sustainability sourcing (SS) as a mediator between IMNI and SCP and between NG and SCP. The first hypothesis proposed in the study was that, "IMNI has a significant impact on SCP", this hypothesis is accepted as R. Germain concluded that IMNI makes the internal supply chain system integrated that results in improvement in supply chain performance [24]. The second hypothesis proposed was that, "NG significantly impacts SCP", this hypothesis is accepted as well according to P. Deflorin when the supply chain system is interconnected globally and is operated through shared information system, SCP positively enhances. The third proposed hypothesis was that, "SP significantly mediates between IMNI and SCP", this hypothesis is accepted as G. Spina in a research summary concluded that a production system that equally takes benefits and gives back to the environment will increase the SCP positively [25]. The fourth hypothesis proposed was that, "SP significantly mediates between NG and SCP", Y. Shi and M. Gregory concluded that when supply chain is working in coordination globally, sustainable production plays a beneficial role in enhancing the SCP. The fifth hypothesis proposed was that, "SS significantly mediates between IMNI and SCP." This hypothesis is accepted on the basis that M. Danilovic also accepted that SS significantly and positively mediates between IMNI and SCP. The sixth hypothesis proposed was that, "SS significantly mediates between NG and SCP." This hypothesis is accepted as well, Y. Cheng and A. Chaudhuri proposed that SS makes sure that network globalization enhances SCP positively [26].

5.2. Conclusion
This study aimed to know about the relationship between IMNI, NG and SCP. This research took SP and SS as a mediator between the above variables. The study targeted the firms of Thailand, producing assembled products, which include machinery, transportation equipment, automotive and electronics industrial sectors a sample of 350 people from each sector, 316 responses were valid was taken and the data analysis proved that IMNI and NG significantly impacts SCP, this research also proved that SP and SS significantly mediate between IMNI, NG and SCP.

5.3. Implications of the study
This study has taken SS and SP as mediating variables, whereas, almost no study took these as mediators in the past. This study also proves to be a good base for practically applying IMNI and NG system in order to improve the SCP in the manufacturing sectors of other countries as well because the problem of poor SCP is not only for the manufacturing sector of Thailand but also for the manufacturing sector of other countries as well. IMNI and NG should be included in the policies of manufacturing sectors and supply chain system in order to enhance supply chain performance.

5.4. Limitations and Future Research Indications
This research took limited industries as a research sample while in future, the number and types of industries can be increased by keeping the same variables under study. This research can be conducted in other countries as well in order to create a same opinion on a similar thinking platform. This will also create a consistent and unidirectional opinion about the problem under study. Nature of variables can be changed in future studies, like operational agility can be inserted as a mediator as well in order to study the same variables with the impact of a different mediator.

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659

Int. J Sup. Chain. Mgt   Vol. 8, No.5, October 2019

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