**THE MEDIATING ROLE OF TRUST AMONG SUPPLY CHAIN PARTNERS ON SUPPLY CHAIN INTEGRATION, CULTURAL INTELLIGENCE, LOGISTICS FLEXIBILITY AND SUPPLY CHAIN PERFORMANCE**

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***ABSTRACT:*** *This paper aims to propose a theoretical framework to study mediating role of trust among supply chain (SC) partners on the relationship between supply chain integration (SCI), cultural intelligence (CQ), logistics flexibility (LF) and supply chain performance (SCP). SCI, CQ, LF, trust are the concept that can help firms to enhance their SCPs. Firms with a high level of SCI, CQ, and LF may achieve effective SCP. Firms' SCPs, however, is still ineffective or developed too slowly. This paper reviews related concepts, especially from previous supply chain studies, as they are the key to develop a research model. The author attempts to benefit the academic profession by extending knowledge and confirmations in enhancing SCP influenced by trust among SC partners, CQ, SCI, and LF. This paper may be one of the first to develop an integrated model examining the complex relationship among diverse factors which differs from previous studies.*

**Keywords:** supply chain integration, cultural intelligence, logistics flexibility, trust, supply chain performance

1. **INTRODUCTION**

The globalization, leading to a decrease in obstacles to international business, has reformed the way in which entrepreneurs do the business [32]. It causes high competitions in doing business. The entrepreneurs need to develop their firms by increasing the competitiveness to sustain their businesses. One of key success factors is the ability in analyzing and measuring supply chain performance (SCP) to compare with the standard criteria or indicators of both local and international firms in the same industry. SCP completely contains supply chain members' activities which includes reliability, responsiveness, agility, cost, and asset management efficiency. SCP, consequently, reflects supply chain members' strengths and weaknesses, including the existing risks in the supply chain for using the information to sustainably improve and develop the efficiency and competitiveness in the supply chain. In line with SCP measurement, the entrepreneurs can benchmark their business and learn best practices from other firms. They can use SCP information as tools to monitor, control, and assess their overall operation. The plans are difficult to be accomplished without SCP measurement [17].

The previous studies, however, indicate the problems in supply chain management (SCM) [48]. As a result, it could be assumed that SCP of the firms may not be excellent and needs to be improved at the present. Prior works depict that supply chain integration (SCI) [1, 28], cultural intelligence (CQ) [44], logistics flexibility (LF) [29] can enhance the performance. In addition, some past researches represent the positive effect of trust on performance as well [53]. This paper, therefore, attempts to study the role of these factors in the specific environment.

As mentioned above, the existing gaps in the literature exist. First, an integrated model examining the complex relationship among CQ, SCI, LF, Trust and SCP is still missing. Therefore, examining the issues of how CQ, SCI, LF and SCP are mediated by the trust is still unclear. More importantly, the main gaps in the current literature are the lack of empirical evidence on the relationship between CQ [44] as well as LF and SCP [46]. The result of past studies cannot be generalized because the study on different industries could result in the different findings. Second, research gaps also include the lack of empirical analysis on how and which dimension of SCI is important for Trust as well as for SCP. SCI in this paper, therefore, are categorized into several dimensions differed from previous literature. And, notably, supply chain managers are also seeking to find answers on which SCI are likely to be mediated by the trust that can consequently enhance SCP. The insights from this study will allow managers to effectively utilize the different components of SCI for Trust and SCP. This study, therefore, proposes a theoretical framework to fill these gaps.

1. **LITERATURE REVIEW**

2.1 Supply Chain Integration

The SCI in this research consists of 4 dimensions. First, participation denotes the degree to which a common commercial objective to be accomplished is involved in decision making, including the decision making concernment, goals setting, and knowledge generation [18]. Second, shared values denote the extent to which partners have mutual principles about what actions, objectives, and plans are significant or insignificant, suitable or unsuitable, and correct or incorrect [50]. Third, information sharing, in the supply chain, can be stated as an "inter-organizational sharing of data, information and/or knowledge in supply chains” [33]. Finally, communication refers to important and well-timed information sharing between organizations by both formal and informal manners [4]. In terms of SCM, there is the evidence that participation in the policy-making process leads to effective SCM [57, 61]. Communication might sustain the supply chain process and communication flows might also improve SCP [27]. The previous literature in Supply Network Management shows that the main component supporting a trustworthy relationship is a set of shared values [5, 15, 23, 30].

2.2 Cultural Intelligence

The theory of CQ was presented by Earley as an original set of skills that act as a descriptive instrument for the achievement in the global environment [19-20]. CQ is defined as ‘an individual’s skills to organize well in cultural different situations’[20]. CQ is a multidimensional concept consisting of four aspects (cognitive, metacognitive, motivational, and behavioral CQ) [20]. Foreign companies sometimes need to adapt their values to the values of local supply chain members. CQ can be assumed as the connection between global and local values. CQ consequently supports the interpretation of local values, so CQ assists with matching global values and local values effectively [44]. Each member in the supply chain comprises a set of cultural values [40-41]. Culturally intelligent organizations decode the stakeholders' value set not to create the economic exchange to the power of their value sets but go beyond this economic accountability toward advanced principles of the strategy in the market [25]. CQ which reveals abilities to efficiently organize oneself and to cooperate with others in cross-cultural settings [21], may diminish the degree of cultural difference or generate the firm’s advantage and then lead to high performance of supply chain.

2.3 Logistics Flexibility

LF refers to the ability of a company to react immediately and proficiently to changing client requirements in inbound and outbound distribution, support, and services [14, 16, 55]. LF consists of four elements. First, physical supply flexibility refers to the ability of a company to offer a diversity of inbound resources and supplies for manufacturing, immediately and proficiently [7, 16]. Second, purchasing flexibility refers to the ability of a company to make contracts to purchase a diversity of resources and supplies, immediately and proficiently [22, 52, 60] Third, physical distribution flexibility refers to the ability of a company to adapt the packaging, inventory, warehousing, and physical product transportation to meet customer requirements, immediately and proficiently [12, 35-36] Finally, demand management flexibility refers to the ability of a company to react to the diversity of customer requirements to deliver time, price, and service, immediately and proficiently [37, 39]. To analyze the determinants of supply chain flexibility, and its impact on firm performance in a sample of Spanish automotive suppliers, The relationship between flexibility and business performance was identified [58].

2.4 Trust among Supply Chain Partners

Basically, trust is a mutual relationship between partners that indicates a high level of confidence in each other’s decorum [9]. Trust in SCM refers to the willingness to rely on a Supply chain partner in whom the company believes [49]. Trust is also viewed as an essential component of the viewpoint toward supply chain and other parties in the system [28]. It has been considered as serious interactive capital that assists combined operations among supply chain (SC) partners [2, 51, 62]. Trust can be established by generating an atmosphere in which SC members enthusiastically exceed the insignificant requests of a relationship to raise the probability of achievement for the supply chain [31]. Previous studies explained that trust is a beneficial lubricant to cope with social crisis and an essential element to sustain collaboration and to evade conflicts [62]. Applying the transaction cost theory, it is explained that trust among SC partners can diminish opportunism and raise particular investment [13]. If there is a trust between a producer and a partner, it has belief in the partner based on the anticipation of collaboration, regardless of its capability to observe the activities of SC partners [47]. Therefore, generating trust has become a strategic technique to support long-term relationships among SC partners.

2.5 Supply Chain Performance

 SCP refers to the functional assessment that develops for each member, as well as for the entire supply chain as a consequence of involvement in a supply chain relationship [26]. SCP can be divided into the efficiency and effectiveness of supply chain processes. The efficiency signifies the interior outcome of supply chain processes. While the effectiveness denotes the exterior outcome experienced by the end customer [6]. In other words, the efficiency is the capability of the supply chain to deliver a level of end customer service at low cost with high levels of accurateness in matching manufacturing with real demand. Effectiveness is the capability of the supply chain to provide the end customers with their desires. Consistently, the supply chain process integration, driven by the supply chain cost and customer orientation essentially leads to positive outcomes in both the efficiency and effectiveness of SCP [10].

1. **THEORETICAL FRAMEWORK**

Figure 1 describes the conceptual model and hypotheses in this study. The rectangle stands for observed variables, which comprise participation, shared values, information sharing, communication, cognitive CQ, Metacognitive CQ, Motivational CQ, Behavioral CQ, Physical distribution flexibility, and demand management flexibility. The ellipse stands for latent variables, which consist of SCI, CQ, LF, trust, and SCP. There are seven main hypotheses.

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| **Fig (1) Proposed theoretical framework** |

3.1 Hypothesis Development

3.1.1 SCI and Trust among SC partners and SCP

As SCI in this paper consists of participation, shared values, information sharing, and communication, the previous studies depict that these factors have a positive effect to trust [11, 34]. This study, therefore, proposes the following hypothesis:

H1: SCI is positively affected to trust among SC partners.

3.1.2 CQ and Trust among SC partners and SCP

As CQ decodes local values and arranges the value set of an organization with the set of local values, it mirrors a degree of trust [61] in local members in the supply chain. CQ will construct trust among SC partners beyond the economic exchange in calculation-based trust [42-43] as a result of its stakeholder orientation [24]. Past Research results affirmed that CQ has a positive effect on identity-based trust and knowledge-based trust [45]. This study, therefore, proposes the following hypothesis:

H2: CQ is positively affected to trust.

3.1.3 LF and Trust among SC partners and SCP

As supply chain flexibility is positively affected by higher levels of perceived common comprehension and perceived supplier dependency in the supply chain [58]. It is supposed that trust between SC partners was constructed through the honesty and flexibility in managerial attitude as well as in sustaining organizational truthfulness [54]. It is also found that trust plays the positive mediating roles in the relationship of demand management flexibility fit on performance with high significance, while demand management flexibility fit was less significant. This proposes that trust links between demand management flexibility fit and performance [29]. However, this evidence only arose from suppliers and distributors in the mobile industry in a specific country. The evidence stemmed from other parties in the supply chain in a different area might cause the new outcome. This study, therefore, proposes the following hypotheses:

H3. LF is positively affected to trust among SC partners.

3.1.4 Trust among SC partners and SCP

This paper mainly focuses on the mediating role of trust in influencing the relationship between SCI, CQ, LF and SCP. Although previous literature was found that trust is fundamental to cooperation in healthcare SCP. It has the positive relationship to healthcare supply chain performance [1]. Such a result is consistent with the outcomes of some previous study [38]. Several studies, however, represented the opposite results [3]. Besides, trust has a positive influence on SCI [63]. Additionally, SCI increases financial performance [59]. Similarly, trust is predicted to have a domino influence on SCM independent variables such as knowledge exploitation. Such independent variables were found to affect both supply chain integration and SCP [10]. Above and beyond, trust raises the degree of engagement between supply chain members, improves collaboration, reduces costs, increases the satisfaction between SC partners, decreases conflicts and official agreements, develops the decision making process, boosts information flow, increases productivity, and strengthens responsiveness leading, thus, to effective SCI which offers SCP improvement as an outcome [8, 56]. Therefore, according to this line of reasoning, the following hypothesis is proposed:

H4: Trust among SC partners is positively affected by SCP.

The linkage of these hypotheses mentioned before allows the researcher to clarify the mediating effect of trust in the relationship among SCI, CQ, LF, and SCP. This study, therefore, proposes the following hypotheses:

H5: Trust among SC partners positively mediates the effect of SCI on SCP.

H6: Trust among SC partners positively mediates the effect of CQ on SCP.

H7: Trust among SC partners positively mediates the effect of LF on SCP.

1. **DISCUSSION AND CONCLUSION**

Although previous studies represented the results as mentioned in the prior part, the evidence was still particularized. Conducting the researches in different areas might provide the varied results. For further study, this concept can be applied to survey researches in some countries which the entrepreneurs come from diverse cultural backgrounds as they need the information to adapt their acts suitable with SC partners to success their businesses.

As a conclusion, the proposed theoretical framework provides an alternative factor for firms to use for improving their SCPs. The study also proposed seven main hypotheses that predict the effect of SCI, CQ, LF, and Trust on SCP, and the mediating effect of trust on the relationship between SCI, CQ, LF and SCP. By conducting an empirical study based on the proposed hypotheses, the results of the study are expected to deliver some new knowledge that can subsidize to the efficiency of firms’ SCP.

1. **REFERENCE**
2. Abdallah, A.B., Abdullah, M.I., and Saleh F.I.M., "The effect of trust with suppliers on hospital supply chain performance: The mediating role of supplier integration*" Benchmarking: An International Journal*, 24(3): 694-715 (2017).
3. Adler, P.S. and Kwon, S., “Social capital: prospects for a new concept” *Academy of Management Review*, 27(1): 17-40 (2002).
4. Al-Abdallah, G.M., Abdallah, A.B. and Bany Hamdan, K., “The impact of supplier relationship management on competitive performance of manufacturing firms” *International Journal of Business and Management*, 9(2): 192-202 (2014).
5. Anderson, J.C. and Narus, J.A., “A model of distributor firm and manufacturer firm working partnerships” *Journal of Marketing*, 54(1): 42-58. (1990).
6. Bowersox, D.J., “The strategic benefits of logistic alliances” Harvard Business Review, July/August, 36-45 (1990).
7. Caplice, C. and Sheffi, Y., “A review and evaluation of logistics performance measurement systems” *International Journal of Logistics Management*, 6(1): 61-74 (1995).
8. Carter, J.R. and Narasimhan, R., “The role of purchasing and materials management in total quality management and customer satisfaction” *International Journal of Purchasing and Materials Management*, 30(3): 3-13 (1994).
9. Çerri, S., “Exploring factor affecting trust and relationship quality in a supply chain context” *Journal of Business Studies Quarterly*, 4(1): 74-90 (2012).
10. Chang, L., Ouzrout, Y., Nongaillard, A., Bouras, A., and Jiliu, Z., “Multi-criteria decision making based on trust and reputation in supply chain” *International Journal of Production Economics*, 147, Part B: 362-372 (2014).
11. Chen, D.Q., Preston, D.S., and Xia, W., “Enhancing hospital supply chain performance: a relational view and empirical test” *Journal of Operations Management*, 31(6): 391-408 (2013).
12. Choopak, W. & Aunyawong, W.. The Development of Tourism Logistics and Supply Chain Management of Lampaya Floating Market, Banglen Nakhon Pathom, Thailand. Proceedings of the 2018 ICBTS International Academic Multidisciplinary Research Conference, Radisson Blu Style Hotel Wein, March 1-3, Vienna, Austria: ICBTS Conference and Publication. (2018).
13. Cooper, M.C., Lambert, D.M. and Pagh, J.D., “Supply chain management: more than a new name for logistics” *International Journal of Logistics Management*, 8(1): 1-13 (1997).
14. Corsten, D. and Felde, J., “Exploring the performance effects of key-supplier collaboration: an empirical investigation into Swiss buyer-supplier relationships” *International Journal of Physical Distribution & Logistics Management*, 35(6): 445-461 (2005).
15. Croom, S., Romano, P. and Giannakis, M., “Supply chain management: an analytical framework for critical literature review” *European Journal of Purchasing and Supply Chain Management*, 6: 67-83 (2000).
16. Das, T.K. and Teng, B.-S., “Between trust and control: developing confidence in partner cooperation in alliances” *The Academy of Management Review*, 23(3): 491-512. (1998).
17. Davis, T., “Effective supply chain management”, Sloan Management Review, Summer, 35-46 (1993).
18. Division of Logistics, Department of Primary Industries and mines, Ministry of Industry. Logistics and Supply Chain Performance Index. Hand book for Industrial Logistics Performance Index (ILPI) and Supply Chain Performance Index (SCPI) (2015).
19. Dwyer, F.R. and Oh, S., “A transaction cost perspective on vertical contractual structure and interchannel competitive strategies” *Journal of Marketing*, 52: 21-34 (1988).
20. Earley, P.C., Redefining interactions across cultures and organizations: Moving forward with cultural intelligence. *Research in Organizational Behavior* 24: 271–299 (2002).
21. Earley, P.C. and Ang, S., *Cultural Intelligence: Individual Interactions across Cultures*. Stanford, CA: Stanford University Press. (2003).
22. Eisenberg, J., Lee, H.J., Brück, F., Brenner, B., Claes, M.T., Mironski, J., and Bell, R., “Can business schools make students culturally competent? Effects of cross-cultural management courses on cultural intelligence” *Academy of Management Learning & Education*, 12(4): 603-621 (2013).
23. Ernst and Whinney, Corporate Profitability and Logistics: Innovative Guidelines for Executives, Council of Logistics Management, Oak Brook, IL (1987).
24. Fawcett, S.E., Magnan, G.M. and McCarter, M.W., “Benefits, barriers and bridges to effective supply chain management”, *Supply Chain Management, An International Journal*, 13(1): 35-48 (2008)
25. Fougère, M. and Moulettes, A., “Disclaimers, dichotomies and disappearances in international business textbooks: a postcolonial deconstruction” *Management Learning*, 43(1): 5-24 (2012).
26. Friedman, M., “The social responsibility of business is to increase its profits” *New York Times Magazine*, 13(32-33): 122-126 (1970).
27. Gagalyuk, T., Hanf, J., and Hingley, M., “Firm and whole chain success: network management in the Ukrainian food industry” *Journal on Chain and Network Science*, 13(1): 47-70 (2013).
28. Gambetti, R.C. and Giovanardi, M., "Re-visiting the supply chain: a communication perspective" *Corporate Communications: An International Journal*, 18(4): 390-416 (2013).
29. Gimenez, C., van der Vaart, T., and Pieter van Donk, D., “Supply chain integration and performance: the moderating effect of supply complexity” *International Journal of Operations & Production Management*, 32(5): 583-610 (2012).
30. Hua, S., Chatterjee S.R., and Kang‐kang, Y., "Access flexibility, trust and performance in achieving competitiveness: An empirical study of Chinese suppliers and distributors" *Journal of Chinese Economic and Foreign Trade Studies*, 2(1): 31-46 (2009).
31. Ireland, R.D. and Webb, J.W., “A multi-theoretic perspective on trust and power in strategic supply chains” *Journal of Operations Management*, 25(2): 482-497 (2007).
32. Humphries, A.S. and Wilding, R., “UK defence supply chain relationships”, *Management Decision*, 42(2): 259-276 (2004).
33. Johnson D. and Turner C.. International Business: Themes and Issues in the Modern Global Economy. 2nd Edition (2010).
34. Kembro, J. and Näslund, D., “Information sharing in supply chains, myth or reality? A critical analysis of empirical literature” *International Journal of Physical Distribution & Logistics Management*, 44(3): 179-200 (2014).
35. Kulangara, N.P., Jackson S.A., and Prater E., "Examining the impact of socialization and information sharing and the mediating effect of trust on innovation capability*" International Journal of Operations & Production Management*, 36(11): 1601-1624 (2016).
36. Lambert, D.M., Cooper, M.C. and Pagh, J.D., “Supply chain management: implementation issues and research opportunities” *International Journal of Logistics Management*, 9(2): 1-19 (1998).
37. Lambert, D.M. and Stock, J.R., Strategic Logistics Management, 3rd ed., Irwin, Homewood, IL (1993).
38. Lee, H.L., “Ultimate enterprise value creation using demand-based management” Stanford Global Supply Chain Management Forum Working Paper Series, SGSCMF-W1-2001 (2001).
39. Lee, S.M., Lee, D. and Schniederjans, M.J. (2011), “Supply chain innovation and organizational performance in the healthcare industry” *International Journal of Operations & Production Management*, 31(11): 1193-1214 (2011).
40. Lengnick-Hall, C. (1996), “Customer contribution to quality: a different view of the customer-oriented firm” *Academy of Management Review*, 21: 791-824 (1996).
41. Luu, T.T. (2010), “Organisational culture, leadership and performance measurement integratedness” *International Journal of Management and Enterprise Development*, 9(3): 251-275 (2010).
42. Luu, T.T., “Organisational culture and trust as organisational factors for corporate governance” *International Journal of Management and Enterprise Development*, 11(2): 142-162 (2011).
43. Luu, T.T., “What trust grows through upward influence?” *Asia-Pacific Journal of Business Administration*, 4(2): 158-181 (2012a).
44. Luu, T.T., “Underneath organizational health and knowledge sharing” *Journal of Organizational Change Management*, 26(1): 139-168 (2013e).
45. Luu, T.T., "From cultural intelligence to supply chain performance" *The International Journal of Logistics Management*, 27(1): 95-121 (2016).
46. Luu, T.T. and Rowley C., "The relationship between cultural intelligence and i-deals: Trust as a mediator and HR localization as a moderator" *International Journal of Organizational Analysis*, Vol. 24(5): 908-931 (2016).
47. Manders, J.H.M., Caniëls, A.C.J., and Ghijsen, P.W.Th., "Supply chain flexibility: A systematic literature review and identification of directions for future research" *The International Journal of Logistics Management*, 28 (4): 964-1026 (2017).
48. Mayer, R.C., Davis J. H., and Schoorman ,F.D., “An integrative model of organizational trust” *The Academy of Management Review,* Vol. 20, No. 3, pp. 709-734 (1995).
49. Mehrjerdi, Y. Z., "Excellent supply chain management" *Assembly Automation*, 29(1): 52-60 (2009).
50. Moorman, C., Deshpande, R. and Zaltman, G., “Factors affecting trust in market research relationships” *Journal of Marketing*, 57(21): 81-102 (1993).
51. Morgan, R.M. and Hunt, S.D., “The commitment trust theory of relationship marketing” *Journal of Marketing*, 58(3): 20-38 (1994).
52. Nahapiet, J. and Ghoshal, S., “Social capital, intellectual capital, and the organizational advantage” *Academy of Management Review*, 23(2): 242-266 (1998).
53. Narasimhan, R. and Carter, J., “Linking business unit and material sourcing strategies” *Journal of Business Logistics*, 19(2): 155-171 (1998).
54. Panayides P.M. and Venus Lun Y.H., “The impact of trust on innovativeness and supply chain performance”*International Journal of Production Economics,* 122(1): 35-46 (2009).
55. Parkhe, A., ‘‘A building trust in international alliances’’ *Journal of World Business*, 33(4): 417-437 (1998).
56. Perry, J.H., “Emerging economic and technological futures: implications for design and management of logistics systems in the 1990s” *Journal of Business Logistics*, 12(2): 1-16 (1991).
57. Pomponi, F., Fratocchi, L. and Rossi Tafuri, S., “Trust development and horizontal collaboration in logistics: a theory based evolutionary framework” *Supply Chain Management: An International Journal*, 20(1): 83-97 (2015).
58. Prahinski, C. and Benton, W.C., “Supplier evaluations: communication strategies to improve supplier performance” *Journal of Operations Management*, 22(1): 189-205 (2004).
59. Sa´nchez, A.M. and Pe´rez, M.P., ‘‘Supply chain flexibility and firm performance: a conceptual model and empirical study in the automotive industry’’ International Journal of Operations & Production Management, 25(7): 681-700 (2005).
60. Shi, M. and Yu, W., “Supply chain management and financial performance: literature review and future directions” *International Journal of Operations & Production Management*, 33(10): 1283-1317 (2013).
61. Vickery, S.K., Jayaram, J., Droge, C. and Calantone, R., “The effects of an integrative supply chain strategy on customer service and financial performance: an analysis of direct versus indirect relationships”, *Journal of Operations Management*, 24(1): 523-39 (2003).
62. Wallace, A. and Taylor-Gooby, P., “New labour and reform of the English NHS: user views and attitudes” *Health Expectations*, 13(2): 208-217 (2010).
63. Yeung, J.H.Y., Selen, W., Zhang, M. and Huo, B., “The effects of trust and coercive power on supplier integration” *International Journal of Production Economics*, 120(1): 66-78 (2009).
64. Zhang, M. and Huo, B., “The impact of dependence and trust on supply chain integration” *International Journal of Physical Distribution & Logistics Management*, 43(7): 544-563 (2013).
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