The Effect of Trust in Supply Chain on the Firm Performance through Supply Chain Collaboration and Collaborative Advantage

Nagehan UCA* & Murat ÇEMBERCI** & Mustafa Emre CIVELEK*** & Huriye YILMAZ****

Abstract
Trust in the supply chain leads to an increase in supply chain collaboration (SCC) and subsequently in collaborative advantage (CA) and consequently affects firm performance positively. Supply chain collaboration is an effective collaboration of supply chain partners to succeed in a common goal. Concisely, the collaborative advantage is the relative competitive advantage among companies. It refers to the gathering, exchanging and improving the resources among the collaborating partners. This research aims to clarify the relationship between trust in the supply chain and firm performance through supply chain collaboration and collaborative advantage. Analysis results show that trust in the supply chain positively affects supply chain collaboration. Although the proposed model suggested a positive relationship between trust in the supply chain and collaborative advantage, according to the hypotheses test results, this relation is not statistically significant. This means that trust in the supply chain has no direct effect on the collaborative advantage, but has an indirect effect through supply chain collaboration on the collaborative advantage. Finally, the positive effect of collaborative advantage on firm performance has been found to be statistically significant.

Key words: Supply Chain Collaboration, Trust in the Supply Chain, Firm Performance, Collaborative Advantage, Structural Equation Modelling

Tedarik Zincirinde Güven ve Firma Performansı İlişkisinde Tedarik Zincirinde İşbirliği ve İşbirlikçi Avantajın Rolü

Özet
Tedarik zincirinde güven, tedarik zincirinde işbirliği ve sonrasında işbirlikçi avantaj ve sonuç olarak da firma performansı üzerinde pozitif yönde etkiye sahiptir. Tedarik zincirinde işbirliği, Tedarik zinciri partnerlerinin ortak hedeflerinin başarısındaki etkin işbirliğidir. Kısaca, işbirlikçi avantaj sirketler arasındakı göreceli rekabet avantajıdır. İşbirlikçi avantaj, partnerler arasında kaynaklarının, bir araya getirilmesi, değiş tokuş edilmesi ve geliştirilmesini ifade etmektedir. Bu araştırmamın amacı, tedarik zincirinde güven ve firma performansı üzerinde tedarik zincirinde işbirliği ve işbirlikçi avantajın rolünü açıklamaktır. Analiz sonuçları

* PhD, Istanbul Commerce University, Faculty of Business Administration, nuca@ticaret.edu.tr
** Asst. Prof., Istanbul Commerce University, Faculty of Business Administration, mcemberci@ticaret.edu.tr
*** PhD, Istanbul Commerce University, Faculty of Business Administration, ecivelek@ticaret.edu.tr
**** Istanbul Commerce University, Graduate School of Social Sciences, hrylmz@yahoo.com
1. INTRODUCTION

Competition, digitalization, and globalization are inevitable in the modern world and companies have to deal with new product development, cost reduction, and customer demands. These realities of doing business require resources, both financial and non-financial alike but sometimes companies lack these resources to compete. It was in the 1990s when supply chain collaboration started to emerge via VMI (Vendor Managed Inventory) and CPFR (Collaborative Planning Forecasting and Replenishment) concepts, it then evolved into planning and other processes through close cooperation with supply chain partners. Wal-Mart and GE (General Electric) are just two examples of major corporations who managed to increase sales and reduce costs by collaborating with their supply chain partners.

It has been researched by Simatupang and Sridharan under which conditions the proposed benefits of cooperation between a company and its suppliers will be realized. Supply chain collaboration affects firm performance positively. Creation of competitive advantage, cost reduction, revenue increase, flexibility, efficiency, the joint competitive advantage (collaborative advantage), new product ideas, better use of market opportunities and meeting customer demands are the most obvious benefits created by supply chain collaboration.

Trust is very crucial in every relationship, so it is equally important in supply chain collaboration. Özalp et al. (2011) state that trust increases supply chain collaboration. However, the generation of trust, a crucial concept for positive firm performance and collaboration, is not an easy task.\textsuperscript{11}

Long-term relations require trust among partners. Moreover, buyers’ trust in suppliers is ensured by official contracts.\textsuperscript{12} Ring and Ven (1994) expand on this concept and argue that official contracts will maintain a higher level of trust and create non-official psychological contracts over time.\textsuperscript{13}

Supply chain trust leads to supply chain collaboration and collaborative advantage, both of which affect firm performance positively. This study analyses the effect of supply chain trust on firm performance through supply chain collaboration and collaborative advantage with the structural equation model.

2. BACKGROUND

Supply chain collaboration (SCC) is the effective involvement of supply chain partners to attain a common goal.\textsuperscript{14} It can also be defined as the joint work of two or more firms for planning and executing supply chain operations to obtain more benefits than they would act by themselves.\textsuperscript{15} Lambert et al. explain the concept.\textsuperscript{16} As the level of relationship in which risks and benefits are shared among supply chain partners to achieve higher business performance. Another definition of supply chain collaboration is long-term and close partnerships where supply chain members work together and share resources, information and risks for attaining common goals.\textsuperscript{17,18} Studies prove that collaborative behaviors affect interdepartmental relationships in a positive way. It has also been proven that collaboration between logistics and marketing departments foster integrated service systems to meet customer demands, providing better distribution performance and higher firm performance in the end.\textsuperscript{19}

Simatupang and Sridharan (2005) define supply chain collaboration as having five dimensions. These are process improvement, information sharing, incentive alignment, decision synchronization and integrated supply chain processes. The detailed literature analysis by Hudnurkar et al. (2014) includes 27 different factors affecting supply chain collaboration.

This paper takes into account seven dimensions explained by the studies of Cagliano, Caniato, & Spina (2003), Sheu, Yen, & Chae (2006) and Angeles and Nath, (2001). These seven dimensions are decision synchronization, information sharing, incentive alignment, goal congruence, collaborative communication, resource sharing, and joint knowledge creation.

Simatupang and Sridharan (2005) explain decision synchronization as the processes where supply chain partners plan operations that maximize supply chain planning and benefits. Information sharing means the extent of sharing accurate, complete, confidential and relevant information among supply chain partners. Incentive alignment represents the mechanism of how benefits, costs, risks, and incentives are shared. Goal congruence can be defined as the degree that the partners in the supply chain can comprehend that their goals have been achieved by accomplishing the supply chain goals. Collaborative communication means the degree of participants’ willingness to communicate in the network. Cao and Zhang (2011) explain resource sharing as investing in the firm’s capabilities and assets together with the partners, as well as empowering them. Joint knowledge creation is defined as competency development by the partners’ joint work to obtain benefits.

There are many benefits that supply chain collaboration creates for companies. One of these benefits is a collaborative advantage or relative competitive advantage.
among companies.\textsuperscript{33} This is the common benefits gain of collaborating partners that are created after the resources have been gathered, exchanged and improved.\textsuperscript{34} The studies of Cao and Zhang (2010) show that supply chain collaborative advantage directly improves firm performance.\textsuperscript{35}

Collaborative advantage has five dimensions; business synergy, process efficiency, innovation, quality, and flexibility. Business synergy means the extent to which supply chain partners put their relevant and complementary resources together with the aim of gaining extraordinary benefits.\textsuperscript{36} Ansoff states that this synergy results in more benefits to the resources through physical (production equipment) or non-visible (company culture, technology) assets.\textsuperscript{37,38} Process efficiency can be described as the extent of the cost advantage of the collaborative processes in comparison to processes of the competitors.\textsuperscript{39} Collective decision making is also a part of process efficiency, which is an indicator of profitability and success. The innovation dimension of collaborative advantage means the extent to which the supply chain partners work jointly to develop new processes, products, and services. Competition has shortened the product life cycles; therefore, companies need to innovate more frequently. Supply chain partners that have good communication can improve their product and process development skills.\textsuperscript{40} The fourth dimension of the collaborative advantage concept, quality can be defined as the degree to which supply chain partners jointly develop quality products that in turn create more value for their customers.\textsuperscript{41} Flexibility means the extent in which the supply chain network supports the initiation of new services and products required by environmental changes. This dimension can also be called customer responsiveness. Companies that can quickly offer new products and services are expected to have higher profitability and market share.

Trust is explained as the belief by one firm that the exchanging partner will stay away from actions which may result in bad outcomes and engage in actions that create positive outcomes for all partners involved.\textsuperscript{42} It comes about when one partner is confident about the trustworthiness and honesty of the exchanging partner.\textsuperscript{43}
Trust is the relationship among both individuals and organizations, and it changes over time influenced by the behaviors of the individual partners. Mayer et al. (1995) explain trust as the belief of one firm that their partners will behave and act in the interest of their firm, even in the absence of control and monitoring.

Trust is explained in two dimensions; benevolence and capability. Benevolence is more closely related to relationships between individuals, and it is not sufficient in and of itself in a business environment in a competitive and global world. It is the capability that is crucial for firms. Studies including input from supply chain managers state that performance capability and relationship commitment capability are given more importance than other factors. The dependent variable in this study is the firm performance. It can be described as how a firm attains its financial goals in comparison to its competitors.

Financial measures and market share criteria have been used to compare organizations in addition to analyzing their behaviors over time. From a management point of view, costs and profits are the most crucial measurements of performance. Efficiency factor follows these two indicators. Drucker states efficiency and effectiveness are the two dimensions of company performance. Market share, return on investment, ROI growth rate, profit margin, increase in sales and market share, competitive position measures are the tools that are used to measure organizational performance in literature. In the 1990’s, the scope of performance concept had widened, and additional dimensions of quality, innovation, quality of work life and utilization of inputs were added. Nowadays, the concept includes additional dimensions like market share, social responsibility, employee behavior and product and market leadership. Financial information, internal management operations, employee details, customer values, and innovation, have been used as performance measurement tools in the studies of Magutua et al. (2015). These studies have proven that technology used in supply chain processes affects supply chain strategy and firm performance in a positive way. In this paper, firm performance was measured in one dimension.

Based on the literature information mentioned below, the following hypotheses have been created for analysis. In Figure 1, conceptual model is shown.

46 Fawcett, S. E., Jones, S. L., and Fawcett, ibid, p. 163-178.
3. HYPOTHESIS DEVELOPMENT AND CONCEPTUAL MODEL

The research has four hypotheses. Development of the hypotheses are as follows:

3.1 The Relationship between Trust in Supply Chain and Supply Chain Collaboration

A high level of trust generates the motivation for open communication and the will to take risks among partner companies in a buyer–supplier relationship.\textsuperscript{50,51} There are many studies suggesting that collaborative relationships depend on relational forms of exchange represented by a high level of trust.\textsuperscript{52} Boundaries are fading in supply chains among inter-firm partners due to a high level of trust. Since a high level of trust increases the participation of the parties in supply chain, the boundaries of the organizations become uncertain. Mutual trust plays an important role for the supply chain collaboration.\textsuperscript{53,54}

H1: Trust in the supply chain affects supply chain collaboration positively.

3.2 The Effects of Trust in Supply Chain and Supply Chain Collaboration on Collaborative Advantage

The synergy, which is a sub-dimension of collaborative advantage, causes the collaboration between the supply chain partners to produce a total gain.\textsuperscript{55} The partners of the supply chain can increase financial benefits by creating quick solutions to the problems arising among the partners while producing innovative products.\textsuperscript{56} The capability of partnerships to attain cost savings and decrease repetitive actions by the firms involved in the supply chain is increased.\textsuperscript{57} Cooperation among competitors can increase knowledge production and synergy.\textsuperscript{58} Partners will gain primary


\textsuperscript{53} Patterson, Kirk A. Grimm, Curtis M., M. Corsi, Thomas, Adopting new technologies for supply chain management, Transportation Research, 2003, 95–121.


\textsuperscript{55} Simatupang, T. M., and Sridharan, R., ibid., pp. 257-274.


benefits as operational improvements in the short run and an increase in profits and a decrease in the duration of product development processes in the long run.\textsuperscript{59}

H2: Supply chain collaboration positively mediates the relationship between trust in the supply chain and collaborative advantage

H3: Supply chain collaboration affects collaborative advantage positively

3.3 The Relationship between Collaborative Advantage and Firm Performance

Collaborative advantage has a significant positive effect on firm performance. Researches in literature agree that both customer and supplier firms want to build collaborative relationships with each other.\textsuperscript{60,61} Long-term and sustainable relationships with their customers enable the suppliers to reach higher sales and greater returns on their investments.\textsuperscript{62} To increase performance, setting up both internal and external collaboration is needed.\textsuperscript{63} Collaboration can reduce purchasing costs, increase profitability and increase technical information sharing.\textsuperscript{64,65} Thus this study hypothesizes:

H4: Collaborative advantage positively affects firm performance positively

In Figure 1: conceptual model of the research is shown.

**Figure 1: Conceptual Model**

---


\textsuperscript{61} Sheu, C., Yen, H., ibid., pp. 24-49


\textsuperscript{63} Stank, T., Keller, S., and Daugherty, ibid. pp. 29-48.


\textsuperscript{65} Han, S., Wilson, D.T., Dant, S.P., Buyer supplier relationships today. Industrial Marketing Management, Vol. 22, No. 4, 1993, pp.331–338.
4. RESEARCH METHODS

4.1. Measures and Sampling

A questionnaire with Likert-5-scale which included statements regarding supply chain collaboration, trust in the supply chain, collaborative advantage and firm performance to measure the dimensions of research model was generated. For SCC and CA, the scale developed by Cao and Zhang (2010) was used. For firm performance, Akgün et al.’s (2007) scale, which was adapted from Ellinger et al.’s (2002), was also used. To measure trust in the supply chain, a trust scale consisting of 8 questions developed by Doney and Cannon (1997) was used.

Of the more than 200 distributed, 150 valid questionnaires were gathered from companies operating in prominent cities throughout Turkey. According to contribution cities, rates are as follows: İstanbul 68%, İzmir 8%, Kocaeli 7%, Tekirdağ 5%, Denizli 5%, Manisa 3%, Bilecik 3%, Diyarbakır 1%. Questionnaires were gathered during the period elapsed between October 2015 to March 2016.

The questions were directed to only 1 person in each company. Since statements about firm performance were included, high-level management participation was encouraged. The distribution of participating companies according to sectors is as follows: 23% of participants are working in services, 20% chemicals and 16% FMCG sector. 55% of the participating firms have more than 150 employees, and 77% of them have revenue of more than 10 m TL. 84% of the respondents are male, and 66% are female.

4.2. Construct Validity and Reliability

After the data purification process, uni-dimensionality of the construct was assessed. 11 variables were included in the confirmatory factor analysis. To assess convergent validity, confirmatory factor analysis (CFA) was performed by using AMOS 22 on the scales. CFA results indicated that the model was an adequate fit: \( \chi^2/DF = 3.442, CFI=0.716, IFI=0.722, RMSEA=0.128 \). CMIN is The Likelihood Ratio Chi-Square Test. The analysis shows the conformity of the initial model and acquired model. A CMIN/DF ratio is very close to a threshold level of 3. Furthermore, other fit indices exceeded their recommended thresholds.

72 Bagozzi, R. P., and Yi, Y. Assessing Method Variance in Multitrait-Multimethod Matrices: The
Table 1: Confirmatory Factor Analysis Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Standardized Factor Loads</th>
<th>Unstandardized Factor Loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Sharing</td>
<td>InfSh1</td>
<td>0.815</td>
<td>0.732</td>
</tr>
<tr>
<td></td>
<td>InfSh 2</td>
<td>0.881</td>
<td>0.894</td>
</tr>
<tr>
<td></td>
<td>InfSh 3</td>
<td>0.849</td>
<td>0.866</td>
</tr>
<tr>
<td></td>
<td>InfSh 4</td>
<td>0.729</td>
<td>1</td>
</tr>
<tr>
<td>Decision Synchronization</td>
<td>DecSyn11</td>
<td>0.743</td>
<td>0.817</td>
</tr>
<tr>
<td></td>
<td>DecSyn12</td>
<td>0.890</td>
<td>1.114</td>
</tr>
<tr>
<td></td>
<td>DecSyn13</td>
<td>0.767</td>
<td>0.865</td>
</tr>
<tr>
<td></td>
<td>DecSyn14</td>
<td>0.796</td>
<td>1</td>
</tr>
<tr>
<td>Joint Knowledge Creation</td>
<td>JKnwCre31</td>
<td>0.849</td>
<td>0.995</td>
</tr>
<tr>
<td></td>
<td>JKnwCre32</td>
<td>0.885</td>
<td>1.076</td>
</tr>
<tr>
<td></td>
<td>JKnwCre33</td>
<td>0.717</td>
<td>1</td>
</tr>
<tr>
<td>Goal Congruence</td>
<td>GCong7</td>
<td>0.724</td>
<td>0.893</td>
</tr>
<tr>
<td></td>
<td>GCong10</td>
<td>0.688</td>
<td>1</td>
</tr>
<tr>
<td>Source Sharing</td>
<td>ScrSh24</td>
<td>0.703</td>
<td>0.760</td>
</tr>
<tr>
<td></td>
<td>ScrSh25</td>
<td>0.931</td>
<td>1</td>
</tr>
<tr>
<td>Innovation</td>
<td>Inv52</td>
<td>0.879</td>
<td>1.324</td>
</tr>
<tr>
<td></td>
<td>Inv53</td>
<td>0.860</td>
<td>1.345</td>
</tr>
<tr>
<td></td>
<td>Inv54</td>
<td>0.871</td>
<td>1.405</td>
</tr>
<tr>
<td></td>
<td>Inv55</td>
<td>0.668</td>
<td>1</td>
</tr>
<tr>
<td>Quality</td>
<td>Qlt48</td>
<td>0.907</td>
<td>0.806</td>
</tr>
<tr>
<td></td>
<td>Qlt49</td>
<td>0.930</td>
<td>0.840</td>
</tr>
<tr>
<td></td>
<td>Qlt50</td>
<td>0.914</td>
<td>1</td>
</tr>
<tr>
<td>Business Synergy</td>
<td>BSyr44</td>
<td>0.716</td>
<td>1.035</td>
</tr>
<tr>
<td></td>
<td>BSyr45</td>
<td>0.970</td>
<td>0.501</td>
</tr>
<tr>
<td></td>
<td>BSyr46</td>
<td>0.591</td>
<td>1</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Efc37</td>
<td>0.713</td>
<td>1.439</td>
</tr>
<tr>
<td></td>
<td>Efc39</td>
<td>0.673</td>
<td>1</td>
</tr>
<tr>
<td>Trust in Supply Chain</td>
<td>TrsSC58</td>
<td>0.539</td>
<td>0.740</td>
</tr>
<tr>
<td></td>
<td>TrsSC60</td>
<td>0.891</td>
<td>1.553</td>
</tr>
<tr>
<td></td>
<td>TrsSC61</td>
<td>0.955</td>
<td>1.554</td>
</tr>
<tr>
<td></td>
<td>TrsSC62</td>
<td>0.696</td>
<td>1</td>
</tr>
<tr>
<td>Firm Performance</td>
<td>FrPrf64</td>
<td>0.917</td>
<td>1.380</td>
</tr>
<tr>
<td></td>
<td>FrPrf65</td>
<td>0.672</td>
<td>0.936</td>
</tr>
<tr>
<td></td>
<td>FrPrf66</td>
<td>0.601</td>
<td>0.958</td>
</tr>
<tr>
<td></td>
<td>FrPrf70</td>
<td>0.813</td>
<td>1.386</td>
</tr>
<tr>
<td></td>
<td>FrPrf71</td>
<td>0.510</td>
<td>1</td>
</tr>
</tbody>
</table>

Confirmatory Factor Analysis Results are shown in Table 1, and standardized factor loads of each item are larger than 0.5 and significant. These values show the convergent validity of the scales. To assess discriminant validity, average variance extracted (AVE) values were calculated. Results are close to or beyond the threshold level (i.e. 0.5). Reliability of each construct individually calculated. Composite reliability (CR) and Cronbach α values are close to or beyond the threshold level (i.e. 0.7). Descriptive statistics of the constructs, composite reliabilities, average variance extracted values, Cronbach α values and Pearson correlation coefficients are shown in Table 2: Additionally, in Table 2(.) the diagonals demonstrate the square root of AVE values of each variable.

Table 2: Construct Descriptive, Correlation And Reliability

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Information Sharing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.820)</td>
</tr>
<tr>
<td>2. Decision Synchronization</td>
<td>.127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.801)</td>
</tr>
<tr>
<td>3. Joint Knowledge Creation</td>
<td>.317*</td>
<td>.476*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.820)</td>
</tr>
<tr>
<td>4. Goal Congruence</td>
<td>.515*</td>
<td>.226*</td>
<td>.538*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.706)</td>
</tr>
<tr>
<td>5. Source Sharing</td>
<td>.105</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.295*</td>
<td>-.002</td>
<td></td>
<td></td>
<td></td>
<td>(.824)</td>
</tr>
<tr>
<td>6. Innovation</td>
<td>.254*</td>
<td>.368*</td>
<td>.551*</td>
<td>.361*</td>
<td>.014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.824)</td>
</tr>
<tr>
<td>7. Quality</td>
<td>.520*</td>
<td>.144</td>
<td>.373*</td>
<td>.464*</td>
<td>.136</td>
<td>.335*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.917)</td>
</tr>
<tr>
<td>8. Business Synergy</td>
<td>.328*</td>
<td>.385*</td>
<td>.383*</td>
<td>.288*</td>
<td>.369*</td>
<td>.296*</td>
<td>.237*</td>
<td></td>
<td></td>
<td></td>
<td>(.775)</td>
</tr>
<tr>
<td>9. Efficiency</td>
<td>.279*</td>
<td>.334*</td>
<td>.535*</td>
<td>.395*</td>
<td>.306*</td>
<td>.455*</td>
<td>.381*</td>
<td>.242*</td>
<td></td>
<td></td>
<td>(.693)</td>
</tr>
<tr>
<td>10. Trust in Supply Chain</td>
<td>.418*</td>
<td>.163*</td>
<td>.307*</td>
<td>.445*</td>
<td>.234*</td>
<td>.218*</td>
<td>.396*</td>
<td>.233*</td>
<td>.501*</td>
<td></td>
<td>(.787)</td>
</tr>
<tr>
<td>11. Firm Performance</td>
<td>.276*</td>
<td>.049</td>
<td>.165*</td>
<td>-.031</td>
<td>.258*</td>
<td>.443*</td>
<td>.246*</td>
<td>.118</td>
<td>.296*</td>
<td>.108</td>
<td>(.717)</td>
</tr>
</tbody>
</table>

Composite reliability: .891 .877 .673 .665 .807 .893 .941 .812 .649 .862 .836
Average variance ext.: .673 .642 .673 .499 .680 .679 .841 .601 .481 .620 .515
Cronbach α: .856 .872 .845 .684 .791 .896 .934 .788 .629 .859 .825

*p < 0.05

Note: Diagonals show the square root of AVEs.

4.3. Test of Hypotheses

A structural model has been analyzed by using AMOS 23. To test the hypotheses, maximum likelihood estimation methods and the covariance matrix of the items

73 Byrne, B. M. Structural Equation Modeling with AMOS. (New York: Routledge Taylor and Francis Group, 2010).
were used. The absolute and relative goodness-of-fit indices of the model were evaluated. In this analysis, the following indices were used: The absolute goodness of fit indices are the root mean square error of approximation (RMSEA) and the $\chi^2$ goodness of fit statistic. The relative goodness of fit indices is the comparative fit index (CFI) and the incremental fit index (IFI).

**Figure 2: Results of SEM Analysis**

As shown in Figure 2, structural model fit indices adequately indicate model fit. $\chi^2$/DF value is 2.873 and within threshold levels (i.e. between 2 and 5). CFI and IFI are 0.840 and 0.844 respectively. RMSEA is 0.112.

**Table 3: Hypotheses Test Results**

<table>
<thead>
<tr>
<th>Relationships</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust in Supply Chain → Supply Chain Collaboration</td>
<td>0.538*</td>
<td>0.568*</td>
<td></td>
</tr>
<tr>
<td>Trust in Supply Chain → Collaborative Advantage</td>
<td>0.598*</td>
<td>-0.087</td>
<td></td>
</tr>
<tr>
<td>Supply Chain Collaboration → Collaborative Advantage</td>
<td>0.974*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collaborative Advantage → Firm Performance</td>
<td>0.225*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model fit indices

- $\chi^2$/df = 2.345
- CFI = 0.946
- IFI = 0.947
- RMSEA = 0.095

- $\chi^2$/df = 1.969
- CFI = 0.966
- IFI = 0.967
- RMSEA = 0.081

- $\chi^2$/df = 2.873
- CFI = 0.840
- IFI = 0.844
- RMSEA = 0.112

Note: Path coefficients are standardised

*p $<$ 0.05
As shown in Table 3, when $H_1$, $H_2$, $H_3$, and $H_4$ are accepted. These results of the hypotheses indicate a positive and significant relationship between trust in the supply chain and supply chain collaboration, between supply chain collaboration and collaborative advantage and between collaborative advantage and firm performance. According to the analysis results, the relationship between trust in the supply chain and the collaborative advantage is not statistically significant. Trust in the supply chain indirectly affects CA through SCC. This indirect effect is found as 0.593. As shown in Table 3, the direct effect of TSC on CA is -0.022. Consequently, according to the analysis results, the total effect was found to be 0.571.

5. CONCLUSION

This paper aimed to empirically investigate the relationship between trust in the supply chain, supply chain collaboration, collaborative advantage, and firm performance.

The $H_1$ hypothesis suggested that TSC positively affects SCC. According to the analysis result, the $H_1$ hypothesis has been supported. This result is in concordance with the literature. Lack of trust in the supply chain is a major obstacle of collaboration between firms in the supply chain. Therefore, firms in the supply chain should endeavor to establish a trust to create collaboration.

Although the initial model suggested a positive relationship between trust in supply chain and collaborative advantage, this relation is not statistically significant. This means that trust in the supply chain has no direct effect on the collaborative advantage, but has an indirect effect on collaborative advantage through supply chain collaboration. The mediator role of SCC was found statistically significant. Thus $H_2$ hypothesis has been supported.

According to the analysis result, the $H_3$ hypothesis has been supported. Supply chain collaboration positively affects collaborative advantage. Using collaboration created in the supply chain, firms transform this collaboration into an advantage. Finally, collaborative advantage positively affects firm performance. Collaborative advantage consists of innovation, quality and efficiency dimensions. Changes in these dimensions directly affect firm performance. According to Cao and Zhang SCC improves CA and finally affect firm performance. Therefore this result was supported by the current literature. Concisely, firms in the supply chain should build trust to increase collaboration. If this collaboration transforms into an advantage, this advantage will increase the firm performance.

76 Cao, M., and Zhang, Q. ibid. pp. 163-180.
REFERENCES


Byrne, B. M. Structural Equation Modeling with AMOS. (New York: Routledge Taylor and Francis Group, 2010).


The Effect of Trust in Supply Chain on the Firm Performance through Supply Chain Collaboration...


229


