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An Application of Social Capital Theory in Supply Chain: A Case of Thai Global Buyer Firms

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Abstract-The current study has placed an effort to disclose the application of the social capital theory in the supply chain. The Thai global buyers' firms are taken as the final sample of the study. The SEM-PLS is used to analyze the data. It has been revealed in the present research that the focus of social capital is on the creation and knowledge sharing within and across the organizations. This is also indicated by the current research. It has been argued by the prior studies that the use of different organization and outcomes of social capital will benefit the future research including the factors of cost, quality, and flexibility. It has been indicated by the results of current research that social capital theory can be applied to the relation of buyer and supplier with reference to the development of supplier. The statement that there is need for more investigation for the various dimensions of social capital related to relational embeddedness, structural embeddedness and cognitive dimension. It is found that the achievements of buyer performance in the form of total cost is explained by the relational capital in terms of buyer-supplier dependence and cognitive capital in shared values, and structural capital in terms of activities of supplier development. Cognitive capital and relationship commitment are the common explanatory variables for the both performance dimensions.

Keywords: *Supply chain, Social capital theory, Thailand*

1. Background

According to previous research studies, temporary competitive advantage has been gained by the Japanese firms by making investments in the establishment of relationships with suppliers [1]. There is incomplete empirical evidence for the firms in Thailand. In order to achieve and sustain competitive advantage, the significance of inter-organizational relationships is increasing along with different fields related with the organizational research [2]. Through the lens of social capital, a better understanding has been given by this study about the value creation of firms in Thailand to develop long-term relations with the suppliers and social capital development.

Transaction cost economics, information-processing theory, marketing channel theory, social capital theory, transaction value analysis, and resource dependence theory has been used to evaluate the relation between inter-organizational relation and value creation [3, 4]. According to these theories, when investment is made by organizations in the development of relations, share knowledge and combine resources, this result in supernormal profit gains for the firms and the other party. Social capital theory has been leveraged to define the creation of value for buying firms, who are committed to the development of supplier relations.

Industrial firms have initiated practices called supplier development, which is a tangible source of exchange in the organizations. In order to enhance suppliers' performance, the buying firm engages in the activity of supplier development. It is a crucial strategy for analysis because it includes two crucial attributes of social capital known as shared asset investments and shared knowledge. The activities of goal setting, measurement of performance, evaluation of supplier, training of supplier, etc. are included in supplier development. The Korean and Japanese firms are involved in these activities for several years but the firms in US are not into these. There are fewer studies conducted on the US firms from this perspective [5]. The reason for less evidence in the US firms is low investments made by firms in the development of suppliers, as it does not yield immediate returns. Moreover, resources are required to be investment for making supplier development. Supplier performance is improved by US firms in distinct ways. The nature of efforts made for supplier development has been explained by this study. It analyzes the returns attained by the investments of firms in US in development of suppliers. Two basic contributions have been made by this study to the current literature. It has been argued and shown that social capital theory can conceptualize the supplier development. It gives valuable insights for various dimensions of social capital as they are related to the relation of suppliers and industrial buying firms. It is

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indicated by the results that the type of improvements in the buyer performance lead to variation in the significance of social capital dimensions. This has been emphasized in terms of delivery, quality, cost, or flexibility. Important insights have been provided by this study to define the relation between value creation of buyer and social capital commitments.

2.   Theoretical development

2.1   Social capital theory in supply chain

It has been noted by the organizational literature that social relationships offer a valuable asset, which is derived from the available resources [6]. Three dimensions have been proposed by Chowdhury, Lau [7] for social capital, which include cognitive, structural, and relational. The researchers have claimed that social capital is gained from diversity, structural configuration, and boundary spanning roles of participants, centrality, which relates to the structural dimension. The resources, which offer shared representation, systems of meaning and interpretations to the parties are referred by the social capital's cognitive dimension. It is suggested that the process of participation develop shared goals and values as a shared understanding is constructed by the parties [8]. It was claimed by Chowdhury, Lau [7] and Ghoshal that historical interactions develop the personal relations, which is referred as relational dimension. It is referred as the extent of obligation, trust, and reciprocity between the involved parties.

Different performance measures were used to find the influence of social capital on performance. Some researchers focused on the strength of these ties [9]. The influence of these ties along with the strength has been examined by some research. The influence of relational and structural capital of managers was examined by Mphepya, van Rensburg [10] on their performance. It was found that a strong role is played by structural capital in define the managerial tasks, which are execution orientated. However, a strong role is played by relational capital in defining the tasks, which are innovation oriented and give implications to consider the influences of both measures of performance in future researches. The influence of cognitive capital in terms of shared goals and values has been considered less in social capital empirical research. The relation between improvement in buyer performance and social capital dimensions has been hypothesized based on the literature of social capital.

It has been posited by organizational scholars that investments in alliance partners in inter knowledge sharing routines of firm lead to creation of value [51]. For improvement effort in supplier by a buying firm, a fundamental role is played by such routines irrespective of supplier development. The transfer of knowledge, its sharing and tacit transfer such as shared values and technology roadmaps is involved in the shared knowledge by buying firms [11, 12]. Conditions have been considered by Chowdhury, Lau [7], which support the transfer of knowledge in strategic alliances. It has been argued that when there is high transparency of behavior, multiple connections of connections and long horizon of time, clarity of goal, repeated exchanges, frequent interactions between partners, this improves the transfer of knowledge. Several similar factors have been considered in this paper in the setting of supply chain.

The list of competitive priorities has been agreed by the fields of supply chain and operations management. These have become the primary goals of supplier's performance [13]. There are four primary competitive priorities of buying firms working in the manufacturing sector i.e. electronics and automotive. These four priorities for competition are time of delivery, flexibility, reliability, quality, and cost. The manufacturing industries are dependent on the component suppliers. Moreover, the buyer's performance outcomes rely on the supplier's performance outcomes. A strong influence is created on the end customer when the supplier is unable to perform.

Lower costs of inputs are aimed in the electronics and automotive sector to reduce the total cost and offer the products at a competitive price in the market [14]. The partial dependence of improvement in product cost for the buying firm is on enhancing the supplier's subcomponent i.e. rework reduction, downtimes and scrap. When the cost is reduced by the suppliers, this partially benefits the industrial customers through reduced prices [15]. The distribution and production is outsourced to suppliers for reduction in the technological cost in the high technology markets of computer. The efforts of companies to reduce cost by focusing on the external purchasing from suppliers have been signified by the literature on trade.

Since 1980s, the major focus of final assemblers has been on quality because of gap between the US and Japanese manufacturers. The product quality is given by the companies in electronics industry. Moreover, the six-sigma approach imitated by Motorola has been a benchmark in the industry. In the similar way, quality has achieved by the methodologies of design for manufacturing [16, 17]. Problems exist because of the quality issue from some suppliers. The perception of quality by the consumers is influenced by the quality of component parts. Product and quality problems arise when there are not sufficient technical resources and engineering for assuring quality.

With increased flexibility, firms can respond to the uncertain external environment [18]. When companies strive to fulfill the changes in customers' needs, flexibility becomes a key concern in the manufacturing. It is avoided by the electronics firms to hold inventory of obsolete subcomponent for products due to the decline in sales of these products at the end of cycle time. Buying firms aim at becoming flexible to react to the changes in demand of

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the end customers. There is great need for product mass-customization for driving such outcome [19]. The flexibility of assemblers can be expected to be the aspect of delivery time, quality, flexibility, and reliability of suppliers. The changes should be met by the suppliers in terms of quantity requirements, delivery time of products on short notice and producing at short intervals [16].

When long-term relations are established by the buyer firms with the key suppliers, performance is improved as per the supply chain theory. It is suggested by the research and experience that relation specific investments are not made by the suppliers, when buying firms do not develop long term relations as well as investment s for improving performance of suppliers. When the buying firm do not make resource commitments, relation specific investment are considered opportunism vulnerable by the suppliers [20]. When the buying firm responds for developing long-term relation, this indicates willingness for making investments for improving performance of the suppliers. This can also improve the performance of buyer firm. The following hypothesis has been suggested by these arguments.

2.2   Cognitive capital in supply chain

It has been suggested that shared systems, interpretations, and representations are resources provided by cognitive capital as per the social capital theory Chowdhury, Lau [7]. It was argued by Chowdhury, Lau [7] that a shared division defines a firm having cognitive capital such as shared goals and parties' motives. This exists when there are similar perceptions among the partners for achieving common goals. It has been suggested by Chowdhury, Lau [7] that cognitive capital has the primary dimensions known as shared culture and goals. The researchers claimed that when there is a common approach and understanding among the members of a network for the achievement of certain outcomes, goals are shared.

With the interaction and mutual understanding between the parties, reinforcing participation process is resulted as the values are shared by the buyers and suppliers [8]. The performance of buyer can be improved through this cooperative cognitive sense making self-reinforcing process. A shared understanding develops between the suppliers and buyers, when they have shared goals. These result in cost improvement, quality, flexibility, and better delivery services. The conflict or events can be misinterpreted when two parties interact with incongruent values [21]. With the intensification of conflict, there can be dissatisfaction among the parties, which results in limited sharing of information. Ultimately, there is a negative influence on performance and productivity. A negative relation was found by Graebner, Lumineau [22] between the supplier performance and buyer-supplier conflict in the electronics-manufacturing sector. It was

argued by Dujak [23] that there is need to resolve the timeliness and diverse quality views in order to make collective efforts and shared focus to ensure coordination. In supply chains, it was found that the subjective and objective measures of reduction in time cycle are involved in shared meaning [24]. It is suggested by these arguments that when similar values and goals are possessed by the buyers and key suppliers, the performance is positively influenced by the cognitive capital.

2.3   Structural capital in supply chain

It was concluded by Gong, Jia [25] that appropriate practices are established among the firms by shared purpose linked with social capital. It is suggested by the research that there can be information sharing can range from general to tacit knowledge sharing. It has been recognized in the research on supply chain management and organization theory that a key role is played by sharing of information or sharing information with key suppliers in gaining capabilities through ties within the firm.

The sharing of information has been referred as the level with which every party shares its information to facilitate the activities of the other party [26]. It involves the sharing of information, evaluation fo suppliers and direct involvement in the development of supplier activities i.e. visiting the facilities of suppliers regularly and training them [20, 27]. There are noncompetitive attitudes towards learning in the collaborative relation of supplier and buyer. This results in higher learning, which is symmetric as compared with other types of alliances [21]. Moreover, the exchange of information can be expected in the context of supplier development between the buyers and key suppliers to be complicated. The buying firms are involved directly into the activities of supplier development. In this way, they have face-to-face interactions with the key suppliers. For successful knowledge transfer, thicker exchange of information exchange through investments. Therefore, the firms who get involved in the supplier development activities visit sites regularly train the employees of suppliers and have a commitment team for supplier development [20]. Moreover, initiatives of supplier development linked with personal communication types having tacit transfer of knowledge are positively linked with the quality improvement as well as reliability, speed, and flexibility. In this regard, the following research hypothesis has been proposed:

2.4   Relational capital in supply chain

It has been argued by the extant relational capital that with the increase in the interaction level between the partners, routines of an organization are developed [28]. This results in the increase of bilateral level of dependence and investment in co-special assets. With the investments

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in routines, skill development, and establishing relation among partners, co-specialization is formed [29]. Learning is enhanced and collaborative expectation is raised with the experience of a partner. This also readjusts the cycles with the establishment of relations. It has been argued by [30] that ex-post adjustments in monitoring mechanisms of relation are supported by experience of the specific partners. It suggests that adjustment is facilitated through the previous ties because of the development of organizational routines and familiarity. It has been argued by the previous researchers that when the time length of the relation between the suppliers and buyers increases, this increases the level of trust [31]. Moreover, previous studies have revealed that a strong influence is created on the accumulation of knowledge with repeated ties specific of partners as compared with the repeated ties of general experience. The non-equity alliances are linked closely with several previous ties among the partners as compared with the alliances based on equity.

The opportunism expectations are reduced as per the history of collaboration among the firms [32]. This reduces the perceptions about the exchange issues. It was noted by Bundy, Vogel [33] that the calculus is altered by the previous transactions as the expected cost to deal with the suppliers decreases with the historical interactions. It has been suggested by these arguments that previous exchanges have established the relational norms, which substitute the vertical integration, complex, and explicit contracts. The partners develop mutual trust with repeated interactions and there is no need to depend on the formal type of contracts for performance [34]. It has been found by research based on the relation of buyer and supplier that with the higher frequency of relation contract, the level of cooperation increases. With the working time together, the level of trust between the suppliers and buyers also increases [35]. It has been suggested that the organizations achieve cost reduction and skills for solving problems. Therefore, it can be expected that the relational capital can be positively linked with the improvement of buyer performance. The following hypotheses have been developed in this regard.

3.   Hypothesis Development
Based on the literature reviewed the following hypotheses are prosed

H1: Byer firm commitment (BFC) has significant impact on the byer firm performance (BFP)

H2: Byer firm supplier evaluation (BFEST) has significant impact on the byer firm performance (BFP)

H3: Byer firm length of relationship (BFLRS)has significant impact on the byer firm performance (BFP).

H4: Byer firm supplier development (BFPSD) has significant impact on the byer firm performance (BFP).

H5: Byer firm shared values (BFPSV) has significant impact on the byer firm performance (BFP)

H6: Byer firm length of relationship (BFLRS) has significant impact on the Byer firm supplier development (BFPSD)

H7: Byer firm supplier development (BFPSD) mediates the relationship between Byer firm length of relationship (BFLRS) and the byer firm performance (BFP).

4.   Methodology
Feng, Yu [36] developed and assessed the scales of environmental performance, internal management of environment, customer cooperation, economic performance, recovery of investment and operational performance. Younis, Sundarakani [37] assessed and used the scale of organizational performance. Shah, Zhu [38] identified the items, which were used for the scale of green information system. The previous research studies have been used for taking scales [36, 37]. The assumption has been made for content validity. Significant difference has been returned by Chi-square difference tests for each scale pairing with scales of other study. The level of significance came out at 0.01 level, which reflects that there is suitable discriminant validity for every scale [39].

This study adopts the Structural Equation Modelling (SEM) for analysis due to several reasons. SEM is considered to have equal ability with multiple and linear regression analysis which assume that variables are evaluated with no errors. Even though SEM involves multiple regression and factor analyses, it has a more effective way of estimating instrument for a number of separate multiple regression equations which it evaluates concurrently [40]. There are number of reasons which make PLS-SEM a popular approach among researchers. Several arguments about the reasons of employing PLS by researchers and scholars were assessed [41]. According to Hair, Hult [42] PLS approach is useful especially when the sole purpose of using structural modelling is to obtain explanation and prediction about the constructs. For current study, PLS-SEM technique is employed assuming it to be more flexible, demands less in terms of sample size, and have an ability to handle multiple structural modeling. Moreover, the model is constituted of reflective and formative constructs. The study aims to reflect prediction between the constructs. Hair, Hult [42] also supported the reasoning for employing Partial Least Square method. SEM-PLS approach involves two models i.e. structural model and measurement model.

5.   Results
Measurement model shows the relation among the observed and the latent variables. In estimating the measurement model, changes occur in all items of the model. Therefore, strong correlation is expected to exist between variables and are combined to form a construct. In order to confirm the validation of measurement model i.e. how well the observed variables represent the

constructs, Confirmatory Factor Analysis is done. Under CFA, first and second order constructs are estimated. During estimation of the measurement model, all elements are separately analyzed using reflective, formative, and structural modeling.
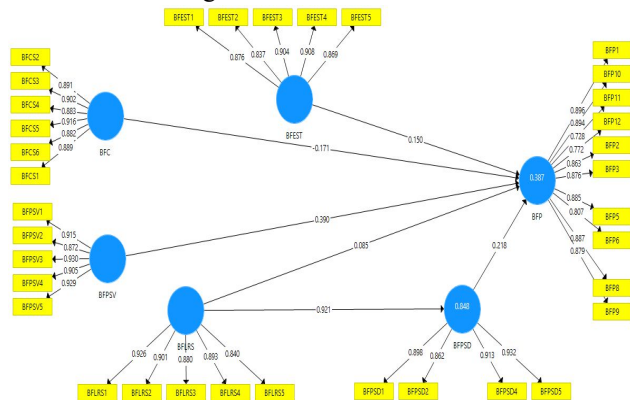

Figure 1. Measurement Model

Table 1. Outer loadings

	BFC	BFEST	BFLRS	BFP	BFPSD	BFPSV
BFCS2	0.891					
BFCS3	0.902					
BFCS4	0.883					
BFCS5	0.916					
BFCS6	0.882					
BFEST1		0.876				
BFEST2		0.837				
BFEST3		0.904				
BFEST4		0.908				
BFEST5		0.869				
BFLRS1			0.926			
BFLRS2			0.901			
BFLRS3			0.880			
BFLRS4			0.893			
BFLRS5			0.840			
BFP1				0.896		
BFP10				0.894		
BFP11				0.728		
BFP12				0.772		
BFP2				0.863		
BFP3				0.876		
BFP5				0.885		
BFP6				0.807		
BFP8				0.887		
BFP9				0.879		
BFPSD1					0.898	
BFPSD2					0.862	
BFPSD4					0.913	
BFPSD5					0.932	
BFPSV1						0.915
BFPSV2						0.872
BFPSV3						0.930
BFPSV4						0.905
BFPSV5						0.929
BFCS1	0.889					

Several researchers have suggested that the reliability of every item should be determined by each item loading [40, 42, 43]. The benchmark for item loadings is set at 0.70 and any value less than this should be eliminated as per the suggestion of Hair, Sarstedt [40]. Internal reliability can be determined through composite reliability in PLS path model [44]. This reliability is defined through the value of Cronbach's α. Its value should be higher than the benchmark 0.70 [45]. The composite reliability value for the variables has been shown in table, which reflects that the range of the values is 0.844-0.985 and these values are greater than 0.70 making it acceptable. Therefore, the reliability in the research is acceptable. The convergent validity has been described by Ngah, Zainuddin [46] at the level with which an item is determined by multiple items. The convergent validity has been determined in this study based on the AVE as per the support of Tzempelikos and Gounaris [47]. It is recommended that the value of AVE should be greater than 0.5 and any value lesser than 0.5 should be eliminated to improve the value of AVE.

Table 2. Reliability

	Cronbach's Alpha	rho_A	CR	(AVE)
BFC	0.950	0.951	0.960	0.799
BFEST	0.926	0.928	0.944	0.773
BFLRS	0.933	0.935	0.949	0.789
BFP	0.957	0.961	0.963	0.723
BFPSD	0.923	0.925	0.945	0.813
BFPSV	0.948	0.952	0.960	0.829

Fornell-Larcker criterion of discriminant validity is a powerful measure and has been widely used by the researchers in studies. Discriminant validity measures the association between reflective variables and their constructs. Generally, it operationalizes the variables that are involved in the model. Thus, the current study incorporated this as a threshold for assessing discriminant validity. Value for reliability index is expected to be 0.70 or above. Thus, the value for outer-loadings and cross-loadings turned out to be the same. Since cross loadings analyse the presence of correlation among the constructs, therefore, current study has examined the discriminant validity between the variables and constructs, as shown in table 3.

Table 3: Validity matrix

	BFC	BFEST	BFLRS	BFP	BFPSD	BFPSV
BFC	0.894					
BFEST	0.811	0.879				
BFLRS	0.790	0.796	0.888			
BFP	0.720	0.769	0.726	0.850		
BFPSD	0.773	0.725	0.721	0.752	0.901	
BFPSV	0.892	0.715	0.649	0.777	0.770	0.911

The second step in the PLS method is to assess the outer model, which is the structural model. as per the recommendations of Henseler, Hubona [48], the effect size, value of R2, Path coefficients, predictive relevance and moderating effect has been determined to evaluate the outer model. The structural model of the study has been represented as below:
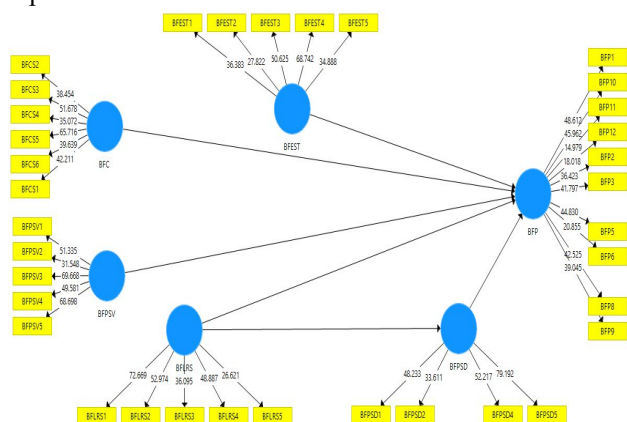
Figure 2. Structural model

For determining the path coefficient significance, the procedure of standard bootstrapping has been used. A sample based on 435 cases and 5000 bootstrap has been used [40, 42, 48].

Table 4. Direct Relationship

	(O)	(M)	(STDEV)	T Statistics	P Values
BFC -> BFP	0.171	-0.169	0.171	3.997	**0.000**
BFEST -> BFP	0.150	0.141	0.199	3.754	**0.000**
BFLRS -> BFP	0.286	0.287	0.144	1.982	**0.024**
BFLRS -> BFPSD	0.921	0.920	0.016	7.443	**0.000**
BFPSD -> BFP	0.218	0.229	0.175	5.249	**0.000**
BFPSV -> BFP	0.390	0.401	0.171	2.281	**0.011**

Table 5. Mediation

	(O)	(M)	(STDEV)	T Statistics	P Values
BFLRS -> BFPSD -> BFP	0.201	0.211	0.162	4.240	**0.000**

In PLS-SEM method, the main criteria for the determination of structural model are the variance in the dependent variable represented by R². It shows the variation in the dependent variance because of the independent variable [40, 42](Hair et al., 2006; Hair et al., 2010). The value of R square is considered weak, moderate, and substantial when it comes out to be 0.24, 0.50, and 0.75.

Table 6. R-Square

	R Square
BFP	0.387
BFPSD	0.848

Blindfolding procedure is the only estimate of the dependent latent variables having a model with multi dimensions [49]. Latent variable is described as reflective measures that lead to difference in indicators' set. The nature of study is reflective and blindfold method has been used. A cross-validated measure of redundancy has been used to evaluate the research model's analytical significance (Q²) [42, 49].
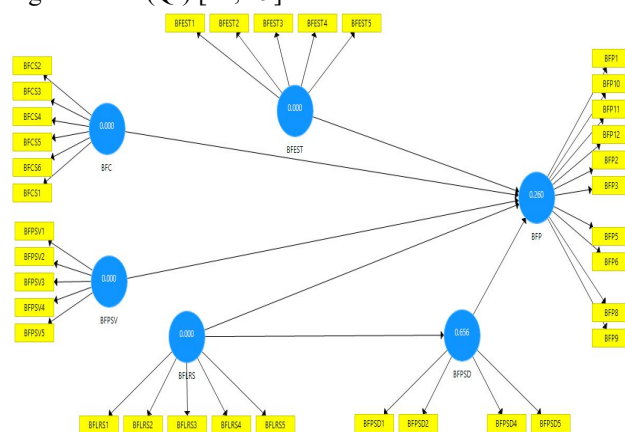
Figure 3. Q-Square

6. Conclusion and Discussion

It has been indicated by the present research that the focus of social capital is on the creation and knowledge sharing within and across the organizations. This is also indicated by the current research [7]. It has been argued by Flynn, Koufteros [50] that the use of different organization and outcomes of social capital will benefit the future research including the factors of cost, quality, and flexibility. It has been indicated by the results of current research that social capital theory can be applied to the relation of buyer and supplier with reference to the development of supplier. The statement that there is need for more investigation for the various dimensions of social capital related to relational embeddedness, structural embeddedness and cognitive dimension.

The relation of buyer and supplier has been examined to restate the results using social capital theory. The key focus was laid on the performance of buyer achieved through supplier development. It was found by the results that performance goals could be established through commitment between the firms. This offers value to the buying firm, which aims at accumulation of social capital with the suppliers. Moreover, it has been suggested by the findings that there are unique effects of various dimensions of social capital based on the performance goals i.e. cost vs. quality, flexibility, and delivery. The achievements of buyer performance in the form of total cost is explained by the relational capital in terms of

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buyer-supplier dependence and cognitive capital in shared values, and structural capital in terms of activities of supplier development. Cognitive capital and relationship commitment are the common explanatory variables for the both performance dimensions.

The outcomes of performance in terms of flexibility, delivery, and quality are based on direct involvement of suppliers as compared with the outcomes of cost performance. The direct involvement in the development of supplier is measured in terms of buyer personnel allocation for improving the technical skill base of suppliers. An environment is indicated by this form of interaction that supports the knowledge transfer between partner firms, which supports learning. There is need for shared goals and values for improving both performance dimensions. These can be shared through face-to-face interactions with dedicated team. For the activities of supplier development, delivery, quality, and flexibility came out to be significant. During the negotiations of contracts, the concerns about cost and total cost can be resolved as compared with the concerns for delivery, quality, and flexibility.

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