

Relational stability and alliance performance in supply chain[☆]

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Abstract

Drawing on the theories of social exchange and goal interdependence, this paper examines the antecedents of relational stability in supply chain alliances and if the stability affects alliance performance in supply chain in the context of manufacturing firms. The results show that both relational commitment and trust of supplier have positive effects on relational stability in supply chain alliance, which in turn positively affects the alliance performance. These results have important implications for researchers investigating the effectiveness of supply chain alliances as well as practitioners seeking to improve alliance performance in supply chain.

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1. Introduction

In past decades, cooperative alliances have attracted increasing interest from operations management researchers. In a competitive setting, alliances bring firms some advantages including enabling them to enhance cooperative behavior and resolve competitive conflicts [1], obtain greater learning benefits [2], develop innovative products [3], deal with turbulence and market uncertainty [4], and in some firms improve technical skills [5].

In line with the paramount interest in alliances, scholars are paying attention to buyer-supplier relationship. Managing interorganizational relationships to create closer linkages and greater cooperation is generally regarded as providing significant potential for corporate success [6]. A strong buyer-supplier relationship requires a stable relationship in order to realize long-term benefits. Complementing the long-term orientation of a buyer-supplier relationship that concerns the interdependence of outcomes for the relationship [7], relational stability requires the willingness of firms to make short-term sacrifices to maintain the relationship when firms feel secure and confident in the relationship for long-term benefits [8]. Firms that form strong relationships with suppliers can better align their interests and goals with those of their suppliers [9]. Buyer and supplier firms in a supply chain tend to heavily rely on cooperation to survive in an uncertain business

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environment that is characterized by rapid product obsolescence and evolving customer needs. These firms pursue growth mainly through effective cooperation and working jointly with partners in their supply chain, which in turn results in more new product offerings, enhanced new skills, and dissuaded competition [10]. However, these firms still face problems in achieving their growth. First, evolving market needs to make products obsolete quickly, with firms facing more intensive competition than ever before. Second, imbalanced information and lack of resources have also been the reasons causing the ineffectiveness of supply chain relationship [11]. “Looseness” between firms has been used to describe the problems these firms face [12]. Prior studies have suggested that cooperative alliance is a potential strategy to offset the looseness in a supply chain for the improvement of supply chain relationship because it requires a reasonably open exchange of information to maintain the relationship and promote success for both sides of the exchange dyad [13]. Empirical studies have found that, cooperation in the form of alliances, enable firms to share financial risk, improve service quality, increase productivity, and reduce costs (e.g., [14]).

The cooperative alliances formed between suppliers and buyers can be illustrated by two broad streams of explanations. The first suggests that the partner firms along the supply chain form strategic cooperative alliances to acquire needed resources, learn new technical skills, and obtain information [10,5]. Informed by the social exchange theory, this explanation indicates that social relationships are formed and maintained because the partner firms offer reciprocal benefits to one another over time [15]. If they did not, the relationships would cease to exist [16]. In line with this, prior studies have suggested the important roles of social network and organizational linkages in social capital (e.g., [5]). In cooperative alliances, the partner firms are closely integrated through voluntary, informal, and reciprocal bonds through which their resources are exchanged [17].

The second explanation is drawn on the goal interdependence theory. According to Deutsch [18], people's beliefs about how their goals are related to their partners' goals determine the way in which they interact with their partners, which in turn affects their performance and group cohesiveness. In particular, when an exchange is structured cooperatively, there are positive correlations among team members' rewards. Cooperative alliances between firms in a supply chain enable the partner firms to create perceptions of shared goals and promote supportive behavior, whereby each

partner looks out for the interests of the others. A successful alliance has a long-term orientation requiring trust, loyalty, and sharing of information, risks, and rewards [19]. These partner firms share past resources (e.g., experiences and know-how) that are beneficial to firms in a supply chain, which can in turn improve the effectiveness of the supply chain as firms exploit the resources in their exchange. As such, alliance performance can be viewed as the sustainability of a stable and cooperative relationship that enables allying partners to attain benefits from the relationship.

Relational stability is important in an alliance because, when accomplished, both organizations can concentrate on their core businesses while having the opportunities to venture into other markets [20]. Statistics suggest that the major reason alliances fail over time is the shift in one of the alliances' strategic directions. As such, relational commitment has been shown to be a determining factor affecting successful partnership [21]. Prior research has suggested that such basic principles as (1) being responsible, (2) following through on alliance assignments, (3) treating alliance with equality, (4) being of equal importance, and (5) being reliable no matter what problems arise, nurture a successful alliance [22].

Alliance in a supply chain is important to integrate supply chain networks [23], as they emphasize long-term association and encourage mutual planning and problem solving [24], while relational stability determines the consistency, steadiness and effectiveness of alliances. Although previous studies have advanced the understanding of cooperative alliances between buyers and suppliers, several research gaps remain. First, prior research on supply chain alliance has focused mainly on the effectiveness of alliances [25]. Relational stability in supply chain alliances has received limited research attention.

Second, a majority of past studies have focused attention on alliances in general business relationships with only a few of them have examined firms outsourcing less competent supply chain operations. For example, it is increasingly becoming a common practice among partner firms to use logistics service providers for handling all or part of the logistics activities of their exchange [26,27]. Yet, little research has assessed the driving forces that lead to relational stability between suppliers (e.g., logistics service providers) and buyers in supply chain alliances. In particular, the driving forces can be presented through relational commitment, capital, and trust, which are characteristics of a buyer-supplier relationship that may affect the stability of the relationship

according to the social exchange theory and the goal interdependence theory. However, there is a lack of studies that have taken them into account when dealing with relational stability.

Third, little prior research has linked the relational stability in supply chain alliances with alliance performance. Relational stability is conducive to improving alliance performance because it provides opportunities for learning, acquiring, sharing, and innovating over time [28,29]. Given the potential attractiveness of cooperative alliances with the involved buyers and suppliers, it is important to examine the link between relational stability in supply chain alliances and alliance performance.

This study contributes to the literature by examining the above research gaps with the purpose to empirically examine, (1) if relational stability in supply chain alliances matters in improving alliance performance and (2) whether the antecedent factors, including relational capital, relational commitment, and trust of supplier, affect the relational stability. These research objectives were achieved through collecting survey data from a sample of buyer-supplier relationships in south and southeast United States.

2. Hypotheses development

2.1. Relational capital, relational commitment, and relational stability in supply chain alliances

Relationship-centered organizations recognize the importance of maintaining strong and enduring ties with key suppliers as markets become more dynamic and demanding. Relational capital can be defined as the value of a firm's network of relationships with its customers, suppliers, alliance partners, and internal sub-units [30]. Relational capital concerns the organization's relationships with its network of customers as well as its network of strategic partners and stakeholders. Previous studies have suggested that relational capital creates a basis for learning and know-how transfer between partners [31], in which partners can exploit the resources in their buyer-supplier relationship to improve their business performance. As such, contemporary business firms are treating their network of relationships as assets. According to the social exchange theory and the goal interdependence theory, firms focus on attaining a trust-based, mutually beneficial, and enduring relationship with internal and external constituencies for continuance of the relationships. Thus, a high level of relational capital is

likely to engender relational stability between partner firms.

Relational commitment is defined as “an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it; that is, the committed party believes the relationship is worth working on to ensure that it endures indefinitely” [32]. Relational commitment in alliances brings about mutual respect for buyers and suppliers and drives out the need for competition from rivalries. It instills confidence in partner firms and engenders mutually beneficial exchanges [33]. Based on the social exchange and goal interdependence perspectives, commitment entails stability and sacrifice, as it helps to establish social relationships and promote supportive behavior between partner firms. In addition, firms that rely on alliance relationships are more likely to conform to decisions and agreements that have consensus and to share information with their partner firms [21]. A strong sense of commitment on stable prices and on time delivery ensures an unlikely replacement of suppliers [34] and this relationship brings about a common understanding that leaves alternatives far distant and are not compared to the current partner alliances [35]. This committed effort instills a dependent relationship between partner firms. Such approach would lead suppliers to feel less vulnerable to their buyers and give them more creative advantage, which in return gives the buyers the benefits of the suppliers' greater creativity [36]. Lai et al. [33] suggested that a successful buyer-supplier relationship requires commitment between partners in the supply chain alliance. Following this line of research, we propose that:

Hypothesis 1. *Relational capital positively affects relational stability in supply chain alliance.*

Hypothesis 2. *Relational commitment positively affects relational stability in supply chain alliance.*

2.2. Trust of supplier and relational stability in supply chain alliances

Trust of supplier has become the groundwork for business transactions. The presence of trust creates a better working environment for partner firms as it can reduce the specification and monitoring of contracts, provide incentives for cooperation, and reduce uncertainty [37]. Responsibility, equality, and reliability have been considered as three foundations on which trust is based to foster relational stability [22]. Trust encourages the involved parties to feel comfortable in cooperating with one another [36]. As a result, trust

building can improve operational effectiveness and product quality [38].

In a buyer-supplier relationship, trust results in greater openness between partner firms, thereby generating greater knowledge and appreciation for each other's contribution to the relationship [39]. Trust among managers of different exchange parties increases productivity because they can spend less time monitoring and criticizing one another, which then allows them more time to work on a common goal [36]. Trust with suppliers exerts a direct positive effect on supply chain proximity [40], where suppliers are genuinely concerned with the success of buyer firms. A buyer firm that trusts its supplier is more committed to and intends to stay in the relationship [41,32] in hopes of attaining stability of relationship for mutual benefits. Collaborative relationships rely on relational forms of exchange characterized by a high level of trust [42]. According to Monczka et al. [43], trust can lead to alliance success in terms of relational stability. Therefore, we suggest that:

Hypothesis 3. *Trust of supplier positively affects relational stability in supply chain alliance.*

2.3. Relational stability in supply chain alliances and alliance performance

According to Pearson et al. [44], the benefits of maintaining a stable and close alliance include: (1) ongoing cost reductions that could be achieved via market transactions; (2) quality improvements that exceed what suppliers could accomplish alone; (3) increased operating flexibility that yields economic lot sizes at or close to one; (4) design cycle times that are 50–75% shorter than those in traditional relationships; (5) enhanced leverage with technology, including earlier access to new concepts; (6) more powerful competitive strategies; and (7) quicker and more responsive to meeting customer needs. Supplier alliances can also provide a buyer firm with such benefits similar to that of vertical integration as better coordination and faster response to market requirements [45]. On the other hand, relational stability in alliance is strongly related to short-term productivity improvements as well as long-term competitive advantages in the market place [46]. The ability of a business to improve its supply chain performance can be affected by the quality of relationships formed with partners and suppliers [47]. A stable collaborative alliance gives the involved parties a better ability to outperform their competitors [48–50]. As a stable relationship is instrumental in cultivating alliance performance in a supply chain,

we hypothesize that:

Hypothesis 4. *Relational stability positively affects alliance performance in supply chain.*

3. Research method

3.1. Sample and data collection

Firms were solicited from manufacturers in the industries of petroleum, chemical, logistics, electronics, and ships manufacturing, located in the south and southeast of the U.S. Following related studies, we used a Likert seven-point scale (e.g., 1 = strongly disagree, 7 = strongly agree) for all items to ensure higher statistical variability among survey responses [51]. The respondents were asked to evaluate survey questions from the perspective of a buyer and its relationship with its suppliers. As some constructs concern not only the suppliers of the focal firm, e.g. relational capital that captures the relational resources of a focal firm in its supply chain, measurement items of these constructs require the survey targets to assess the relationship with their buyer firms as well.

In the data collection, we used the key informant approach. This approach has been widely used in empirical studies because of the key informants' knowledge and access to the information related to its supply chain, and familiarity with the operational environment of the firms [52]. Respondents were asked to focus on their most recent exchange partnership. In the selection of key informant, we ensured that the informants possess a high degree of familiarity with the issues surveyed by asking a series of qualifying questions administered to multiple individuals in each firm. Follow-up visits to the participating firms to verify doubtful responses, cascading interview methods, and verifying of details with neutral observers were used to supplement the survey data. After several rounds of follow-up contacts, 126 questionnaire responses were received. After eliminating the returned questionnaires where data were incomplete, the total effective sample size was reduced to 105. This data collection procedure yielded an effective response rate of 27%.

3.2. Measures and validation

All scales used a seven-point scoring format ranging from "strongly disagree" to "strongly agree," unless otherwise stated. Some measurement items were adapted and re-worded to fit the purpose of this study. The measurement constructs used in this study were drawn from several sources. For relational capital, the construct was adapted from Kale et al. [31]. For relational

Table 1
Construct measurement and confirmatory factor analysis

Measures	Std. loading
<i>Relational capital (proportion of variance extracted: 0.57; alpha: 0.81)</i>	
1. Friendship with the focal buyer	0.68
2. Reciprocity between the partners	0.76
3. Cheating will not occur between the partners	0.59
4. Trust between the partners	0.78
5. Close interaction between the partners	0.93
<i>Relational commitment (proportion of variance extracted: 0.74; alpha: 0.95)</i>	
1. Willing to make sacrifices to help buyer	0.92
2. Willing to continue the relationship with partners	0.90
3. Spend a higher amount of time and effort with buyer	0.76
<i>Trust of supplier (proportion of variance extracted: 0.62; alpha: 0.95)</i>	
1. Your supplier keeps promises made to your firm	0.90
2. Your supplier is always frank and truthful with you	0.89
3. You believe the information this supplier provides you	0.76
4. Your supplier is genuinely concerned that your business succeeds	0.67
5. When making decisions, your supplier considers your welfare as well as their own	0.68
6. Your supplier is trustworthy	0.79
<i>Relational stability (proportion of variance extracted: 0.60; alpha: 0.76)</i>	
The relationship between your firm and your suppliers is	
1. Unstable–stable	0.84
2. Short-term–long-term	0.86
3. Insecure–secure	0.60
<i>Alliance performance (proportion of variance extracted: 0.78; alpha: 0.91)</i>	
1. Strength of your relationship with key alliance partners	0.87
2. Stability of your alliances	0.86
3. Ability to sustain relationships regardless of changes in senior people	0.92
Model fit index	
$\chi^2 = 234.91$ ($p = 0.00$), GFI = 0.88, CFI = 0.90, RMSEA = 0.06	

commitment, the construct was drawn from Anderson and Weitz [8] and Morgan and Hunt [32]. Trust of supplier was measured by six items adapted from Doney and Cannon [53]. Relational stability in supply chain alliance was adopted from Johnson et al. [54]. Alliance performance in the supply chain was measured by four items adopted from Emden et al. [55]. To ensure content validity, the initial survey questionnaire was sent to several scholars who are familiar with the literature. This led to minor modifications to some of the measurement items, and the measurement scales were then sent to several executives for their comments. Based on their comments, some measurement items on the survey questionnaire were subsequently rearranged and reworded.

All constructs had a Cronbach α above 0.70; this indicates a good evaluation of reliability of these constructs [56].

We acknowledge that the potential problems of perceptual measures may have led to common method bias. To detect the threat of common method variance, we

conducted the Harman's one factor test as suggested by Podsakoff and Organ [57]. Five factors with eigenvalues greater than one were extracted from all the measurement items, and they altogether explained 87.63% of the variance, with the first factor accounting for 23.86% of the variance. Since no single factor emerged that accounted for most of the variance, common method variance did not appear to be a problem in this study [57].

In examining the convergent and discriminant validity of the constructs, we performed confirmatory factor analysis on a measurement model. The fit indices suggest a good fit for the model ($\chi^2 = 234.91$, $p = 0.00$, GFI = 0.88, CFI = 0.90, RMSEA = 0.06). Table 1 shows the results of this analysis. We also calculated the proportion-of-variance-extracted index for each construct in the measurement model. The results show that: (1) all the indices are above 0.5, and (2) the proportion-of-variance-extracted indices of any pair of constructs are higher than the square of the correlation between that pair of constructs. This demonstrates strong convergent and discriminant validity of the

constructs used in this study [58]. Having established the reliability and validity of the measurement model, we examined the hypothesized structural relationships with path analysis using structural equation modeling.

4. Analyses and results

Results from the path analysis indicate that the overall fit of the model is satisfactory (the fit indices exceed 0.90), and that all four paths were significant with $p < 0.05$ or better except for the path of Hypothesis 1. Table 2 presents the path coefficient estimates for the hypothesized relationships and the statistics on the fitness of the tested model.

The estimation results indicate that the model provides reasonable fit to the data, especially on the basis of goodness of fit index ($GFI = 0.97$), normed fit index ($NFI = 0.98$), and comparative fit index ($CFI = 0.99$). The path estimates in the model were used to test the hypotheses. Hypothesis 1 predicts a positive effect of relational capital on relational stability in supply chain alliances. Unexpectedly, results suggest an insignificant relationship between these two measures ($\beta = -0.21$, $t = -1.83$). Hypothesis 2 predicts a positive effect of relational commitment on relational stability, and results support this hypothesis at significance level $p < 0.05$ ($\beta = 0.26$, $t = 2.04$). Trust of supplier has a significant positive effect on relational stability ($\beta = 0.77$, $t = 11.48$), indicating that Hypothesis 3 is strongly supported. On the other hand, relational stability has positive effect on alliance performance in the supply chain ($\beta = 0.69$, $t = 9.56$), which strongly supports Hypothesis 4.

5. Discussion and implications

This study reveals that relational commitment and trust of suppliers are important for firms in developing stable relationships with their suppliers in supply chain alliance, which in turn is critical for alliance performance. However, we found no support for the link between relational capital and relational stability. This finding is different from existing literature, which states that relational capital is valuable for firms to continue relationships with each other [7]. Based on our findings, we found that the attributes of relational capital, such as friendship and reciprocity in a buyer and supplier relationship, are insufficient in developing a stable relationship. Rather, such desirable attributes for developing relational stability can be found in relational commitment and trust of suppliers. From the social exchange theory perspective, relational commitment instigates social sanctions on both buyer and supplier firms to be loyal to the alliance, fostering stability in the relationship. Due to the psychological dependence on a relationship, relational commitment is a highly desirable element in developing a stable relationship [59]. On the other hand, trust of suppliers plays a role in maintaining a buyer-supplier relationship with an informal social bonding, which motivates exchange of favor and facilitates the development of a stable relationship between buyer and supplier firms [60,61]. In this case, if the buyer firms fail to demonstrate their trust of suppliers, the suppliers will lose confidence and social credit and become unable to perform in the social circle, compromising the stability in the alliance relationship. Furthermore, we found a positive link between relational stability and alliance performance as we

Table 2
Path coefficients for the structural equation model

Proposed path	Expected sign	Path coefficient	<i>t</i> -statistics
H1 Relational capital to relational stability	+	-0.21	-1.83
H2 Relational commitment to relational stability	+	0.26*	2.04
H3 Trust of suppliers to relational stability	+	0.77**	11.48
H4 Relational stability to performance	+	0.69***	9.56
<i>Overall fit indices</i>			
Goodness of fit index (GFI)		0.97	
Normed fit index (NFI)		0.98	
Non-normed fit index (NNFI)		0.95	
Comparative fit index (CFI)		0.99	
Incremental fit index (IFI)		0.99	
Relative fit index (RFI)		0.93	

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

hypothesized. The findings reinforce the view from the social exchange perspective, that relational stability is a hidden norm of reciprocity to exchange favor among the alliance members within a social circle [42].

This study contributes to the literature in logistics and operations management in several ways. First, we conceptualize and empirically test the links between relational capital, relational commitment, relational stability, and alliance performance. They are important issues that help us to better understand the antecedent factors affecting relational stability and the consequent outcome in the performance of supply chain alliance. On the other hand, we extend the use of social exchange theory to the logistics and operations management research to examine buyer–supplier relationships and performance in supply chain alliances. Furthermore, the results of this study shed light on the importance of managing relationships in supply chain alliances in terms of ensuring relational commitment, trust of suppliers, and relational stability.

Regarding the value of this study to managers, they can use our research framework to evaluate the extent to which they have developed adequate relational commitment, trust of suppliers, and relational stability, which are essential for achieving better performance in supply chain alliances. It may make sense for firms in their supply chain alliances to reinforce these elements. In particular, managers are advised to foster stability in a buyer–supplier relationship to improve alliance performance. In addition, managers should be aware that relational capital provides limited value in maintaining a stable relationship in supply chain alliances. The findings of this study also suggest that managers who aim to enhance their relational stability with their supply chain alliances should focus on developing relational commitment and trust of supplier to make the alliance relationship stable and sustainable in performance improvement.

There are some limitations to the interpretation of the results of this study and we leave them as future research topics. Methodologically, the data collected here were based on the sample manufacturing firms. As the success of supply chain alliance requires a supply chain-wide focus, it is desirable to generate information from buyer–supplier dyads or even from different layers in the supply chain. On the other hand, the small sample size and the cross-sectional nature of this study might affect the interpretation of the research results. It is useful for further research to replicate this research and with a longitudinal study to document the evolution of the relationship building process in supply chain alliances to augment the findings of our survey. In terms

of the scope of this study, this research was limited to the study of manufacturers in the United States. To generalize the study results to other national settings, where the strengths of relational stability and its related variables on alliance performance may vary, it may be useful to replicate this study in other social or cultural contexts (e.g. China). This topic is important as the Chinese mainland is a manufacturing powerhouse, where its cultural system emphasizes collectivism, which is opposite to that of individualism in Western countries such as the United States. Such topic will further enhance our understanding of the cultural influence of relational stability and how it may affect the performance of supply chain alliances.

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