

Innovation Benefited by Relationship Learning

Li-Wei Wu*

Department of International Business, Tunghai University, Taiwan

Chen-Yu Lin

Department of International Business, Feng-Chia University, Taiwan

Abstract

This study examines the effects of commitment and relationship investment on relationship learning and also incorporates functional conflict and innovation orientation as well as their influences on the relationship between relationship learning and innovation. The findings support the positive relationships among commitment, relationship investment, relationship learning, and innovation. Meanwhile, functional conflict and innovation orientation enhance the effect of relationship learning on innovation.

Key words: commitment; relationship investment; relationship learning; innovation; functional conflict, innovation orientation

JEL classification: M3; L1

1. Introduction

In a complex technological era, innovation has been increasingly viewed as a product of the alliance partnership (Roy et al., 2004). Therefore, firms must prioritize their search for effective methods for managing such partnerships and achieving high innovation performance (Beheshti, 2004; Dibrell et al., 2014). Relationship learning is an essential mechanism by which firms can learn from one another to increase their knowledge base and develop their innovative capabilities (Fang et al., 2011; Myers and Cheung, 2008). Therefore, relationship learning has been employed to understand the dynamics and evolution of inter-firm collaborations (Mellat-Parast and Digman, 2007). For example, many Taiwanese firms have performed innovative tasks for their global partners in the form of outsourcing arrangements. Through relationship learning, both partners collaborate with and successfully deploy product design and innovation for their global partners (Jean and Sinkovics, 2010). As such, this study treats relationship learning as a strategic asset and expects this critical strategic resource to influence the innovation performance of firms. However, few studies have explored the relationship between

*Correspondence to: Box 953, No.1727, Sec.4, Taiwan Boulevard, Xitun District, Taichung 40704, Taiwan. Email: lwwu@thu.edu.tw

relationship learning and innovation. This study aims to fill this research gap and provide insights into how firms improve their innovation performance by promoting relationship learning.

This study examines commitment and relationship investment to understand the antecedents of relationship learning in the alliance partnership context. Commitment and relationship investment are important antecedents of relationship learning (Selnes and Sallis, 2003), and relationship learning alone may be insufficient in influencing innovation. Only a few studies have investigated the factors that facilitate or impede relationship learning in firms with innovation performance. A firm that fosters an atmosphere of functional conflict between firms and their partners can find it easier to bolster their innovation (Andrade et al., 2008). However, existing studies tend to examine the dysfunctional form of conflict and ignore its functional form (Skarmeas, 2006). Therefore, this study provides additional evidence on this topic. Furthermore, an adequate level of innovation orientation facilitates the knowledge transfer across firms and retains the diversity of views, which can help stimulate innovation for firms (Siguaw et al., 2006; Tödtling et al., 2011). Hence, this study incorporates the roles of functional conflict and innovation orientation as well as their influences on the relationship between relationship learning and innovation. These two complementary effects are important in the alliance partnership because they help firms capitalize on the strengths of their alliance partners and achieve innovation more effectively.

First, this study goes beyond existing research studying cooperation, knowledge transfer, absorptive capacity, and partnership similarity for the alliance partnership, but incorporating positive effect for innovation performance through relationship learning. In particular, we address the question, "How relationship learning benefits innovation?" Therefore, from a theoretical perspective, this study represents a systematic attempt to propose and test a model of innovation performance in the context of relationship learning. This study contributes to the literature on B2B marketing by incorporating commitment and relationship investment into the relationship learning process. Second, studies that explicitly examine the contingent conditions between relationship learning and innovation are minimal. In light of this academic gap, this study is the first attempt to investigate the moderating effects of innovation orientation and functional conflict that consequently accentuate the effect of relationship learning on innovation. Third, the roles of many electronic companies in Taiwan as original equipment manufacturer/original design manufacturer (OEM/ODM) suppliers have allowed them to upgrade their innovation performance in the partner relationships. In the viewpoint of management, this study is significant because it offers greater practical insights into the collaborative relationship between Taiwanese firms and their global alliance partners, particularly with regards to the application of relationship learning initiatives.

The rest of the paper is organized as follows. First, previous conceptualizations of commitment, relationship investment, relationship learning, functional conflict, innovation orientation and innovation are presented, along with the development of

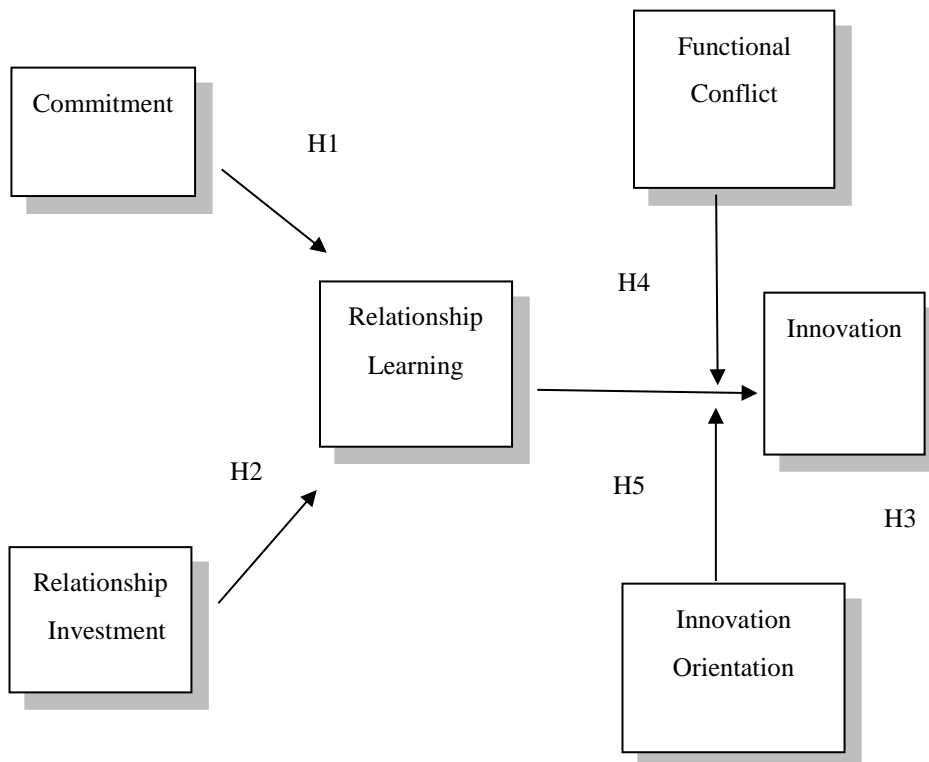
the hypotheses. Next, the methodology and hypotheses tests are described, and the results, discussion, and the study's limitations and suggestions for future study are then outlined. Finally, the implications for business marketing practice are offered.

2. Literature Review

2.1 Conceptual Framework

This study develops a framework that links commitment, relationship investment, relationship learning, functional conflict, and innovation orientation to innovation (Figure 1). This framework has three main features. First, it examines the direct effects of commitment and relationship investment on relationship learning. Second, it examines the direct effect of relationship learning on innovation. Finally, it investigates the moderating effects of functional conflict and innovation orientation on the relationship between relationship learning and innovation.

Figure 1. Conceptual Framework



2.2 Commitment and Relationship Learning

Commitment refers to an enduring desire to maintain a valued relationship (Moorman et al., 1992). Along the same lines, Morgan and Hunt (1994) define it as an exchange partner's belief that a relationship is important enough to warrant maximum efforts at maintaining it. Commitment has both affective and calculative components in marketing literature (Gundlach et al., 1995; Bansal et al., 2004). Affective commitment focuses on a psychological attachment to a service provider (Gundlach et al., 1995), while calculative commitment emphasizes switching costs, or the difficulty in replacing a relationship (Gundlach et al., 1995). Consistent with Morgan and Hunt (1994), the present study focuses on the affective component of commitment.

According to Selnes and Sallis (2003), relationship learning is a joint activity between a supplier and a customer in which both parties share information, which is then jointly interpreted and integrated into a shared relationship-domain-specific memory. Relationship learning is an important process in enhancing the capability and competitive advantage of firms in inter-organizational relationships (Dyer and Singh, 1998). In other words, firms can improve their relationship learning to facilitate their information exchange with their partners and to update their R&D capability (Liu, 2012; Yang and Lai, 2012). Most importantly, the partnerships present the partner firms with opportunities for improved relationship learning and securing competitive advantage (Srivastava and Frankwick, 2011).

Researchers have emphasized the importance of commitment to the development of cooperation (Brennan and Turnbull, 1999; Morgan and Hunt, 1994). In addition, it has been suggested that firms might develop commitment to foster collaborative learning activities (Dyer and Singh, 1998). Hence, the greater the commitment in a relationship, the more reason to learn together by sharing information, making sense of the shared information, and updating mutual memories (Selnes and Sallis, 2003). Gruen et al. (2000) point out that commitment impacts the involvement in relationship learning. Thus, it is hypothesized that:

H1: Commitment will have a positive effect on relationship learning.

2.3 Relationship Investment

Relationship investment is related to how much perceived resource, effort, and attention a firm can dedicate to maintain or enhance relationships with the partner (De Wulf et al., 2001). In general, relationship investment represents the firms' extra efforts, adopted policies, and exclusive offers (Palmatier et al., 2009). As firms perceive that partners satisfy their needs and wants, they will likely consider that the partners are making an extra investment in them. Investing time, effort, and other irrecoverable resources in a relationship creates psychological bonds that encourage partners to stay in the relationship and sets an expectation of reciprocation (Smith and Barclay, 1997).

Relationship investment offers greater opportunities for relationship learning, which requires a high degree of the interaction and a high interdependence between

both parties to generate favorable outcomes (Brown et al., 2000). Similarly, firms may participate in relationship learning when they positively evaluate the efforts of their partners to invest in a relationship with them (Selnes and Sallis, 2003). According to Chang and Gotcher (2007), relationship investments may lead to relationship learning that enhances dyadic capabilities. Specifically, a relationship investment creates a need for the supplier to strengthen the relationship and foster relationship learning (Kohtamäki and Bourlakis, 2012). In other words, relationship investment leads to a greater perceived level of relationship learning for firms. Thus, it is hypothesized that:

H2: Relationship investment will have a positive effect on relationship learning.

2.4 Innovation

Innovation consists of product, process, and administrative innovation (Damanpour, 1991; Subramanian and Nilakanta, 1996). Product innovation refers to the development and introduction of a new product to the market or the modification of existing products. Process innovation involves creating and improving the method of production and integrating new elements to the firm's production process. Administrative innovation refers to changes in organizational structure or administrative processes (Damanpour, 1991).

Dyer and Singh (1998) argue that the critical resources of a firm may span across boundaries and become embedded in inter-organizational sources. Superior innovation performance can be achieved through a set of interlinked firm processes and the coordination of those resources (Chen et al., 2011; Hammervoll, 2009). In this context, firms must actively foster relationship learning to embrace innovation (Chung et al., 2015; Jean and Sinkovics, 2010). In the B2B context, relationship learning improves the efficiency and efficacy of the innovation process (Garcia-Morales et al., 2007; Wang and Hsu, 2014). Overall, relationship learning is expected to enhance innovation in partner relationships (Chen et al., 2009). Thus, it is hypothesized that:

H3: Relationship learning will have a positive effect on innovation.

2.5 Functional Conflict

Functional conflict is defined as an evaluative appraisal of the results of recent efforts to manage disagreements (Anderson and Narus, 1990). Although most studies have traditionally viewed conflict as negative behaviors that characterize unhealthy channel relationships (Skarmas 2006), functional conflict is task-oriented and focuses on judgmental differences in achieving common objectives (Mele, 2011). In other words, functional conflict involves constructive interactions and partner members freely expressing their opinions, and challenging the ideas, beliefs, and assumptions of others (London and Sessa, 2007). Thus, functional conflict contributes to decision quality, because the synthesis that emerges from the diverse perspectives is superior to individual perspectives (Amason, 1996). Most importantly, functional conflict can help reduce groupthink (Massey and Dawes,

2007).

Effective management of conflict is an enabling process that provides an appropriate linkage between partners; it is also a governance tool by which to integrate different views and perspectives between partners (Skarmeas, 2006). Thus, functional conflict can constructively assist alliance partners in recognizing their mutual goals and stimulating greater creativity and innovation (Andrade et al., 2008). In addition, during the relationship learning process, members experiencing high functional conflict tend to tolerate differences and disagreement as well as provide constructive feedback to each other. Thus, such brainstorming leads to the best resolutions without causing a negative effect. In this case, members' motivation and confidence in relationship learning increases (London and Sessa, 2007). In turn, this condition allows relationship learning to innovate more effectively (Siguaw et al., 2006). Thus, it is hypothesized that:

H4: Relationship learning will have a stronger positive effect on innovation when functional conflict is high than when functional conflict is low.

2.6 Innovation Orientation

Innovation orientation refers to the adoption of new skills, resources, and techniques as well as provides an organization with new paths, fresh creativity, and the tendency for change (Hurley and Hult, 1998). Siguaw et al. (2006) define innovation orientation as the totality of organizational strategies and actions toward specific innovation-enabling competencies and processes. In other words, innovation orientation enables a firm to develop and implement innovations. Innovation orientation embodies a multidimensional knowledge structure, which includes learning philosophy, strategic direction, and transfunctional acclimation (Siguaw et al., 2006).

Song et al. (1997) argue that new product development cannot be successful without reducing the barriers among different units. However, a firm may face heavy internal resistance when adopting a new external idea. Innovation orientation is the key driver for overcoming such hurdles and enhancing the ability of firms to adopt or implement new systems, processes, or products successfully (Hurley and Hult, 1998). In reality, innovation orientation encourages and facilitates knowledge transfer across partners, thereby ensuring the retention of the diversity of views and fostering cooperative beliefs and understanding to direct firms toward innovation (Siguaw et al., 2006). Therefore, firms with high innovation orientation can easily understand the necessity of changes and new actions; they are more willing to work together and engage in collective learning (Zhou et al., 2005). By serving as a mechanism that facilitates innovation across partners, innovation orientation can enhance the value of relationship learning toward innovation performance (Chen et al., 2011). Thus, it is hypothesized that:

H5: Relationship learning will have a stronger positive effect on innovation when innovation orientation is high than when innovation orientation is low.

3. Methodology

3.1 Data Collection and Sampling

The sample was randomly drawn from the top 5,000 Taiwanese firms listed in the yearbook published by the China Credit Information Service, Ltd. It was also drawn from a list of firms that listed major collaborative projects in line with their practices related to strategic alliance, joint venture, and research and development (R&D) cooperation. Taiwan is one of the leading computer producers in the world. By participating in the OEM/ODM or electronics manufacturing services networks, many Taiwanese firms have built strategic alliances and R&D cooperation with leading global firms, thus benefitting from these joint efforts (Chang and Gotcher, 2007). Specifically, these are viewed as innovation networks. For example, many Taiwanese firms have begun relationship learning with global alliance partners to co-develop and co-produce the next generation of innovative products and manufacturing processes (Jean and Sinkovics, 2010). As such, Taiwanese firms provide a good case for examining how commitment, relationship investment, and relationship learning with global alliance partners enhance a firm's innovation performance. Next, questionnaires were mailed to 550 companies, along with a cover page that explained the nature of the study.

Questionnaires were completed by senior executives who are familiar with the topic of the study. Follow-up letters were sent after two weeks. Among the 258 surveys returned, 221 were complete in all predictor and dependent variables, resulting in a 40.2% usable response rate. Non-response bias was not a factor because the t-tests of group means revealed no differences between the non-respondents and the respondent in the sample (Armstrong and Overton, 1977).

3.2 Measure Development

All the measures used in the current study were adapted from existing scales. Commitment, relationship investment, relationship learning, functional conflict, innovation orientation, and innovation used a five-point Likert-type scale, with the descriptive equivalents ranging from Strongly Disagree (1) to Strongly Agree (5). For the measurement of innovation, five items for measuring product, process and administrative innovation were adapted from Chen et al. (2009), Cordero (1990), and Ibarra (1993). The measure of relationship learning included six items taken from Selnes and Sallis (2003). The five items used to measure commitment came from Morgan and Hunt (1994). For the measurement of relationship investment, three items were adapted from De Wulf. (2001). The three items used to measure functional conflict were adopted from Menon et al. (1996). The measure of innovation orientation included five items taken from Hurley and Hult (1998) and Siguaw et al. (2006).

3.3 Validation of Measures

The questionnaire was pilot tested to establish face validity with one academics

and one manager who are knowledgeable in this area. According to their suggestions, several items were adapted to better suit alliance partnership context. Finally, confirmatory factor analysis (CFA) was performed to test the measurement model using LISREL 8.52. In assessing reliability, the composite reliabilities and the Cronbach's alpha for each construct were also computed. The Cronbach's alphas of innovation, relationship learning, commitment, functional conflict, and innovation orientation were all greater than 0.80, supporting the reliability of the measurement. In addition, all composite reliability estimates were greater than 0.80, and all average variance extracted (AVE) estimates were greater than the recommended value of 0.50 (Fornell and Larcker, 1981). To ensure the equivalence of the measures in the Chinese and English versions, this study performed back-translation method from Chinese into English (Brislin, 1970). The two translations revealed no substantial differences in the meanings of the items.

As evidence of convergent validity, all the items had significant loadings on their respective constructs (Anderson and Gerbing, 1988). Discriminant validity was assessed for two constructs by constraining the estimated correlation parameter between them to a value of 1.0, and then performing a chi-square difference test on the values for the constrained and unconstrained models (Anderson and Gerbing, 1988). A significantly lower χ^2 value for the unconstrained model was found, thus indicating that discriminant validity was achieved. Discriminant validity was also tested between all constructs according to Fornell and Larcker's (1981) recommendations and confirmed for all pairs of constructs. Specifically, AVE estimate for each construct was greater than the squared correlation of all construct pairs. Appendix A summarizes the results of the item description, AVE, and reliability tests.

Due to the self-reported nature of the data, there was a potential for common method variance, and so the Harman one-factor test was conducted to determine its extent. The unrotated factor analysis showed that the first factor accounted for only 31.51 percent of the variance, and thus the common method bias was not a serious threat in the study (Podsakoff et al., 2003).

4. Analysis and Results

The proposed model was tested through a structural equation model using LISREL 8.52 to explore the following: (1) the direct effects of commitment and relationship investment on relationship learning; (2) the direct effect of relationship learning on innovation; and (3) the moderating effects of functional conflict and innovation orientation on the relationship between relationship learning and innovation.

4.1 Hypotheses Testing

The results of the structural model are reported in Table 1. H1 and H2 were tested by Model 1. The fit of Model 1 was acceptable ($\chi^2(143) = 573.492$, $p = 0.00$, GFI = 0.84, NFI = 0.94, NNFI = 0.95, CFI = 0.96, PNFI = 0.83, RMR = 0.05,

RMSEA = 0.08). As can be seen, all three hypotheses are supported. H1 proposed that commitment would have a positive effect on relationship learning. Model 1 shows that commitment has a positive effect on relationship learning ($\gamma = 0.656$, $t = 9.230$). H2 proposed that relationship investment would have a positive effect on relationship learning. Model 1 shows that relationship investment has a positive effect on relationship learning ($\gamma = 0.224$, $t = 3.593$). H3 proposed that relationship learning would have a positive effect on innovation, and Model 1 shows that it has a positive effect on innovation ($\beta = 0.469$, $t = 6.898$).

Multiple groups were examined to test the moderating effects of functional conflict and innovation orientation, as well as to statistically compare the coefficients between two subgroups. If the coefficients significantly differ from each other, then the higher the coefficients are, the greater the effect on innovation. First, the total sample was divided into two subgroups based on low/high functional conflict and innovation orientation. The sample size was $n = 109$ for the low functional conflict subgroup and $n = 112$ for the high functional conflict subgroup. Meanwhile, the sample sizes were $n = 121$ and $n = 100$ for the low and high innovation orientation subgroups, respectively. Chi-square difference tests were performed to test the equality of the coefficients and to ascertain whether or not the two coefficients were significantly different. If the result of the chi-square difference test was significant, then a difference existed between the two paths. This study compared two subgroups that differed regarding the direct effect of relationship learning on innovation.

H4 proposed that relationship learning would have a stronger positive effect on innovation when functional conflict is high, than when functional conflict is low. Referring to Model 2, the coefficient of the path from relationship learning to innovation is higher in the high functional conflict subgroup ($\beta = 0.602$, $t = 6.262$) than in the low functional conflict subgroup ($\beta = 0.337$, $t = 2.269$). In addition, the chi-square difference is significant ($\Delta X^2 = 4.850$, $df = 1$, $p < 0.05$), thus supporting H4.

H5 proposed that relationship learning would have a stronger positive effect on innovation when innovation orientation is high, than when innovation orientation is low. Referring to Model 3, the coefficient of the path from relationship learning to innovation is higher in the high innovation orientation subgroup ($\beta = 0.681$, $t = 6.390$) than in the low innovation orientation subgroup ($\beta = 0.312$, $t = 3.882$). In addition, the chi-square difference is significant ($\Delta X^2 = 8.722$, $df = 1$, $p < 0.05$), thus supporting H5.

Table 1. LISREL Results

Model	Path	Coefficient	t	ΔX^2
Model 1 (N=221)	Commitment→ Relationship learning	0.656	9.230	
	Relationship investment → Relationship learning	0.224	3.593	
	Relationship learning→ Innovation	0.469	6.898	
Model 2	Low Functional Conflict Subgroup (N= 109)			
	Relationship learning→ Innovation	0.337	2.269	
	High Functional Conflict Subgroup (N= 112)			4.850
Model 3	Low Innovation Orientation Subgroup (N= 121)			
	Relationship learning→ Innovation	0.312	3.882	
	High Innovation Orientation Subgroup (N= 100)			8.722
	Relationship learning→ Innovation	0.681	6.390	

5. Discussion

Knowledge intensiveness and technological complexity make the alliance partners within networks more dependent on the other's knowledge and resources. Firms acquire knowledge from their partners and turn such knowledge into competitive advantage (Peters and Pressey, 2010). Learning is a key mechanism for generating new knowledge and is often an express purpose of collaborative relationships (Westerlund and Rajala, 2010). These partnerships promote resource exchange and utilization among network members through relationship learning. Following this stream of research, we highlight the determinants of relationship learning and its effects on innovation as well as investigate the conditions under which the degree of relationship learning has a stronger effect on innovation. Our model and results offer a new perspective on relationship learning and innovation as well as initial insights into how relationship learning benefits innovation. All five hypotheses relating to these constructs are significant and are in the hypothesized direction. These issues are discussed in detail in the following subsections.

5.1 Commitment, Relationship Investment, Relationship Learning and Innovation

Commitment promotes relationship learning, that is, a partner firm committed to a relationship will cooperate with its partner to promote relationship learning. In other words, through commitment, partners can share and jointly interpret information, which is then integrated into a shared relationship-specific knowledge (Selnes and Sallis, 2003). In addition, relationship investment creates a need for the supplier to strengthen the relationship (Wagner and Bode, 2014) and to foster relationship learning (Chang and Gotcher, 2007). Such investment can enhance the effectiveness and efficiency of the exchange and creates a positive relationship, thus fostering an exchange atmosphere that encourages partners to engage in relationship

learning. In sum, the effectiveness of relationship learning depends on both commitment and relationship investment.

Previous studies have focused on the motivations for internationalizing innovative activities in the global innovation network of firms (Dibrell et al., 2014; Frost and Zhou, 2005). As its main contribution, the current study highlights relationship learning as a key integrating factor in benefiting innovation performance. Our rationale is that relationship learning with partners allows individual firms to create value that they cannot easily accomplish alone. In general, relationship learning facilitates the development of skills and experience in the actual transfer of knowledge from one party to another (Flint et al., 2002; Frost and Zhou, 2005; Prahalad, 2012). Through relationship learning with their alliance partners, firms can reduce their learning curve in acquiring new knowledge. Consequently, these firms can contribute to the success of innovation.

5.2 The Moderating Effects of Functional Conflict and Innovation Orientation

By incorporating functional conflict and innovation orientation, this study developed two hypotheses of moderating effects that clarify the conditions under which relationship learning is effective in enhancing innovation. As a moderating variable, functional conflict enhances the effect of relationship learning on innovation. Functional conflict involves open discussion of the merit of ideas, thereby improving the range of choices provided to alliance partners (London and Sessa, 2007). Functional conflict also produces agreement in the form of a win-win situation for disputants, thus enabling relationship learning. Therefore, under such conditions, relationship learning has a stronger effect on innovation.

In addition, firms with greater levels of innovation orientation obtain commensurately greater benefits from relationship learning in affecting innovation. The rationale is that such firms are likely to have a greater ability to internally disseminate the information learned from alliance partners, and to incorporate the new technology into their existing routines and processes. In this case, relationship learning encourages each party's participation in the innovation process. As a whole, innovation orientation, as moderator, enables relationship learning to achieve better innovation performance.

5.3 Theoretical Implications

Therefore, the relationship approach is a proper theoretical framework for investigating the alliance partnership because the relationship approach puts an emphasis on the importance of the relationship between both parties. In addition, this study breaks new ground on the alliance partnership, focusing particularly on relationship learning that we believe is critical to innovation performance in the alliance partnership. Even more novel is that this study extends existing research by exploring that relationship learning plays a key role in mediating the effect of commitment and relationship investment on innovation for the alliance partnership. Specifically, the context in which relationship learning is more effective to benefit

innovation is by examining the moderating effects of functional conflict and innovation orientation on the relationship between relationship learning and innovation. At a theoretical level, these findings add to the understanding of these relationships that benefit managing the alliance partnership to maximize the innovation performance.

6. Managerial Implications

This study offers practical implications for management. First, external technological resources can influence innovation performance (Ju et al., 2005) and generally come from learning and technology transfer (Huang and Lin, 2006). Therefore, firms must recognize relationship learning as an imperative strategy to achieve innovation. For example, by engaging in relationship learning with their global partners, many Taiwanese original design manufacturers and electronics manufacturing services have successfully emerged as strategic partners of global leader firms, thereby significantly contributing to the new product development of their global leader firms. However, relationship learning is not automatically present. Firms must adapt their existing infrastructure in ways that facilitate relationship learning. Therefore, relationship learning must be explicitly considered in managing partnerships. Most importantly, relationship learning allows the development, acquisition, transformation, and exploitation of new knowledge that enhances innovation (Sanz-Valle et al., 2011). Second, managers can promote relationship learning by developing commitment, which encourages relationship learning with alliance partners by creating a close relationship that affects learning. Therefore, managers must find additional skills and techniques to nurture commitment in their respective partnerships. Relationship investment can also enhance the efficiency or effectiveness of the relationship and hold for relationship learning.

Although relationship learning directly influences the innovation success of a firm, this study suggests that the relationship can be strengthened through functional conflict and innovation orientation. As an effective innovation strategy, a key issue for managers is the integration of functional conflict and innovation orientation in relationship learning. Initially, managers must create an atmosphere of high functional conflict in which partner members feel comfortable in raising dissenting viewpoints. Aside from functional conflict, firms must increase their innovation orientation to learn with their alliance partners more effectively and enhance their innovation performance.

7. Research Limitations and Directions for Future Research

First, the cross-sectional research design employed cannot fully capture the dynamic relationships among the constructs. Future empirical efforts should consider collecting longitudinal data. Such data can offer insights into causal relationship involved in models of antecedents and outcomes of relationship learning.

Second, although t-statistics was conducted in this study to verify that the non-response bias was not a significant issue, the relatively small sample size of the survey served as a potential limitation of this study.

Third, the overall cultural context of commitment, relationship investment, relationship learning, functional conflict, and innovation orientation in Taiwan may be different from other countries. As a result, the findings of this study may not be generalized to other countries. For cross-validation, additional exploration of the relationships should extend beyond our reported sample.

Fourth, this study only adopts the supplier's perspective in the relationships, which raises a potential bias perspective. Given that evidence based on one side of the dyad may not always be replicated for the other party (Anderson and Narus, 1990), future research can explore these variables from both sides to confirm the findings of this study as well as to generate additional insights into the dynamic interactions between two parties.

Appendix A

Items	Cronbach	CR	AVE
Commitment	0.92	0.92	0.71
1. We are very committed to our relationship with alliance partner.			
2. We intend to maintain this alliance partnership indefinitely.			
3. The alliance partnership that we have with this partner deserves my maximum effort to maintain it.			
4. We really care about our ongoing alliance partnership with this partner.			
5. We feel a strong sense of belonging with this alliance partner.			
Relationship Investment	0.87	0.87	0.69
1. Our alliance partner makes efforts to strengthen our relationship.			
2. Our alliance partner makes various efforts to improve its tie with us.			
3. Our alliance partner really cares about keeping us.			
Relationship Learning	0.87	0.87	0.59
1. We exchange information related to changes in the technology of the focal products.			
2. We exchange information as soon as possible of any unexpected problems.			
3. We establish joint teams to solve operational problems in the relationship.			
4. We establish joint teams to analyze and discuss strategic issues.			
5. We frequently adjust our common understanding of end-user needs, preferences, and behavior.			

Appendix A (Continued)

Items	Cronbach	CR	AVE
Relationship Learning	0.87	0.87	0.59
6. We frequently evaluate and, if needed, update information about the relationship stored in our databases.			
Functional Conflict	0.88	0.88	0.71
1. Consultative interaction and useful give-and-take are practiced in this alliance.			
2. Different opinions or views focus on issues rather than individuals in this alliance.			
3. Partner members in disagreement respect each other's views in this alliance.			
Innovation Orientation	0.84	0.86	0.59
1. We encourage alliance partners to adopt new techniques.			
2. We encourage alliance partners to seek out new ways to solve problems.			
3. We plan and design new development processes.			
4. We help alliance partners explore new ideas and innovation methods.			
5. We promote collaboration among functional areas to develop new products.			
Innovation	0.88	0.88	0.60
1. We can accelerate the commercialization of new products through innovation in this alliance.			
2. We can generate considerable profit from our new products in this alliance.			
3. We can develop new technology to improve operations in this alliance.			
4. We can facilitate new processes to improve quality and lower costs in this alliance.			
5. We can develop innovative administration in planning procedures.			

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