Power and trust in supply chain partnerships: interactions and impact on partnership quality and performance

Qile He
Coventry Business School, Coventry University, United Kingdom
qile.he@coventry.ac.uk
Abby Ghobadian
Henley Business School, University of Reading, United Kingdom
abby.ghobadian@henley.ac.uk
David Gallear
Brunel Business School, Brunel University, United Kingdom
David.Gallear@brunel.ac.uk

Abstract
Based on SEM analysis of 413 survey responses from the supply network of a large steel producer, this paper examines the influence of inter-firm trust and indicators of relative power between supply chain partners, and their interactions, on partnership quality and the subsequent supply chain performance of supply chain partners.

Keywords: Supply chain partnership, Inter-firm trust, Relative power, Supply chain performance

INTRODUCTION

Inter-firm power and trust inevitably co-exist within supply chain partnerships and depending on how they are managed, can interact in a complementary or opposing fashion (Ireland and Webb, 2007). By understanding how power and trust interact and impact on the quality of the partnership and the performance of supply chain actors, firms can seek to identify and deploy better strategies to manage power and trust so as to create a better outcome for the supply chain partners and make the supply chain a source of competitive advantage.

Based on the Resource Dependence Theory (Pfeffer and Salancik, 1978), in this study we identified two main indicators of relative power among actors in a supply chain partnership – ‘availability of alternatives’ and ‘restraint in the use of power’. This paper aims to examine the influence of trust and indicators of inter-firm power and their interactions on supply chain partnership quality and the subsequent supply chain performance of supply chain partners. The paper contributes to the extant literature by providing better understanding of trust-power dynamics in supply chain partnerships and their effects on firm performance.

LITERATURE REVIEW

Previous studies suggest that supply chain partnerships are less likely to possess the rigidity
and legal agreements of the contracts prevalent in other forms of inter-firm relationship, such as joint ventures, R&D partnerships and cross-licensing (e.g., Lambert et al., 1996). The lack of rigid contractual agreements and firm-level properties across firm boundaries not only provides operational flexibility lacked in other forms of inter-firm relationship, but also means more effective relationship mechanisms are needed to enable coordination at the inter-firm level for supply chain partnerships (Squire et al., 2009).

Extent literature suggests that inter-firm trust is regarded as one of the key mechanisms bonding supply chain partnerships. According to the Social Capital Theory (Nahapiet & Ghoshal, 1998), relational capital can arise from relational embeddedness (Lawson, Tyler, & Cousins, 2008). Trust is considered as one of the most important components of relational capital because it is the embedded glue of inter-firm relationships (e.g., Cousins et al., 2006). Possession of trust enables the continuation of relationships and the ongoing collaboration between buyers and suppliers.

On the other hand, advocates of the Resource Dependence Theory suggests that power among supply chain partners is another key attribute influencing the operational behaviour and performance of supply chain partners (e.g., Ke et al., 2009). Irrespective of intentions, power considerations play a role in every type of supply chain (New, 1998). The relative power of supply chain partners is likely to significantly influence the distribution of responsibilities and the flow of benefits between them.

Previous research indicated that one of the most important preconditions of productive supply chain partnership, is the level of synergy between supply chain partners (Srinivasan et al., 2011). In this paper we use level of synergy between partners to indicate the quality of supply chain partnership. Synergy between supply chain partners goes beyond alignment of business standards and physical infrastructure, which may not be sufficient to maintain smooth collaborations between partners. It is the level of congruence between partner firms, which serves the function of engine oil which reduces the frictions between partner firms in operations. To ensure collaborative actions, shared understanding and shared culture is needed to achieve congruent common goals and the synergetic course of action between supply chain partners.

Limited pervious studies examined the impact of interaction between power and trust on the partnership quality and eventual performance of supply chain partners. This paper addresses this gap. In this paper, we want to examine how trust and power and their interactions will influence the partnership quality as indicated by the level of synergy between supply chain partners, which may subsequently affect the supply chain performance of partners.

Figure 1 - Framework of relationships between trust, indicators of power, and partnership synergy and supply chain performance
RESEARCH MODEL AND HYPOTHESES

We develop six hypotheses depicting the relationship between trust, power, interaction between trust-power and supply chain partnership synergy and supply chain performance of supply chain firms. The resulting model (see Figure 1) is tested in this paper.

Trust and supply chain partnerships

At the inter-organizational level, trust refers to the extent of trust placed in the partner organization by the members of a focal organization (Zaheer et al., 1998). The ‘loose’ form of supply chain partnerships, characterized by the lack of a rigid contract, requires supply chain partners to rely more on inter-firm trust to maintain the ongoing relationship. The existence of trust stimulates favourable attitudes and behaviours among supply chain partners (Schurr and Ozanne, 1985). As a result, cooperation will replace competition as the norm, and relationship adaptability will increase. Therefore,

**Hypothesis 1**: The inter-firm trust in a supply chain partnership is positively related to the level of partnership synergy.

Power and supply chain partnerships

Power has been defined as “the ability of an actor to influence another to act in the manner that they would not have otherwise” (Emerson, 1962, p.32). Unlike other attributes of supply chain partnerships, power cannot be readily measured. Cox (1999) notes that when examining the power relationship between purchasers and suppliers operating within the same supply chain, it is the relative rather than the absolute power that is of interest. According to the Resource Dependence Theory (RDT), power is rooted in dependence (Pfeffer and Salancik, 1978). It posits that managers can and do act to reduce environmental uncertainty and dependence (Hillman et al., 2009). Central to this action is the concept of power and control over vital resources (Ulrich and Barney, 1984). Enlightened by RDT, the literature identifies two main indicators of relative power among actors in a supply chain partnership – ‘availability of alternatives’ and ‘restraint in the use of power’. While ‘availability of alternatives’ determines objective dependency among supply chain partners, the policy towards the deployment of power (i.e. ‘restraint in the use of power’) determines the realised power.

Availability of alternatives

The Resource Dependence Theory posits that inequalities in dependence creates power imbalances (Pfeffer and Salancik, 1978). Crook and Combs (2007) suggest that members of a collaborative supply chain who furnish important resources or resources where control is concentrated, enjoy superior bargaining power. A supply chain partner with more alternatives is better positioned, and arguably more likely, to exploit those counterparts with fewer options (Ganesan, 1994) which will result in unproductive partnerships. Conversely, firms lacking alternatives and status are likely to have high tolerance for the use of coercions and minor equity concerns and hence make few if any attempts to retaliate (Frazier and Rody, 1991). Under this situation, the partnership is maintained despite having un-equal power influences. Therefore,
Hypothesis 2: The availability of alternatives to the focal firm in the supply chain partnership is negatively related to the level of partnership synergy.

Restraint in the use of power

The second indicator of relative power, ‘restraint in the use of power’, affects ‘realised’ power. It is highly probable that in a supply chain one party may be dependent on another due to differences in availability of alternatives (Cox, 1999). However, dependency may be neutralised if those with power exercise restraint in its exploitive use. Consideration of long-term interests and future gains may encourage firms to adopt a policy predicated on the restricted use of power (Muthusamy and White, 2005), which may result in positive feelings or psychological attachment to the partnership due to better balance in the realised power (Maloni and Benton, 2000). Therefore,

Hypothesis 3: The restrain in the use of power by supply chain partners is positively related to the level of supply chain partnership synergy.

Partnership synergy and supply chain performance

The goal of any supply chain partnership is to benefit supply chain performance of partners, and eventually achieve longer-term market and financial performance objectives and gain competitive advantage. Srinivasan et al. (2011) found that if both partners share a good relationship, they are likely to be more familiar with each other’s knowledge-base which enhances the resulting performance. As an important part of social capital, synergy between supply chain partners will influence the way supply chain partners collaborate and eventually influence the performance of the supply chain. Therefore,

Hypothesis 4: The level of partnership synergy in the supply chain partnership is positively related to the focal firm’s supply chain performance.

Interaction between Trust and Power

Inter-firm power and trust inevitably co-exist within supply chain partnerships and depending on how they are managed, can interact in a complementary or opposing fashion. Having more alternative partners will give the focal firm excessive influence over its supply chain partner. When trust level is low, non-coercive strategies take considerable time to implement effectively. As such, a firm’s possession of relative power will encourage it to act opportunistically to take advantage of the other firm in order to gain a disproportionate share of rewards from their exchange. Consequently, partnership synergy is damaged.

On the contrary, when trust is high in the partnership, as Frazier and Rody (1991) pointed out, coercion may be used with great reluctance only when non-coercive influence strategies have failed to produce a satisfactory response. Possession of relative power by the focal firm over its supply chain partners due to more alternatives may mean the focal firm will be more able to implement non-coercive influence over its partners, such as open discussion and joint problem solving, and hence result in better partnership synergy. Overall, previous literature suggests that higher inter-firm trust neutralizes the negative effects of relative power on partnership synergy, while lower trust level deepens the negative effects of relative power on partnership synergy. Therefore,
Hypothesis 5: Trust and availability of alternatives positively interact to influence the level of supply chain partnership synergy.

When the level of trust is low in the partnership, the reciprocal action theory suggests that the buyer and supplier in the channel relationship are more likely to use reciprocal coercive strategies if the counterpart use coercive strategy, hence retaliation happens more frequently in the relationship (Frazier and Rody, 1991). In consequence the relationship synergy is damaged. Similarly, the buyer and supplier in the channel relationship are more likely to use non-coercive strategies in return to the counterpart’s use of non-coercive strategy, fostering the supportive atmosphere and possibly enhance the performance of the supply chain. As highlighted by Frazier and Rody (1991), the tendency of all types of actions to be reciprocated may be the strongest in exchange relationship that lack true closeness. On the other hand when trust level is high in the partnership, the use of coercive or non-coercive strategies will become less significant to the ongoing relationship. Supply chain partners are more concerned about the actual results of the collaboration, rather than the partnership strategies adopted by the counter part. Thus, higher level of inter-firm trust neutralizes the importance of the restrained use of power by supply chain partners while lower level of inter-firm trust signify the positive effect of restrained use of power. Therefore,

Hypothesis 6: Trust and restraint in the use of power negatively interact to influence the level of supply chain partnership synergy.

RESEARCH METHOD

Our primary data were collected based on a structured questionnaire survey from the supply network of a large Chinese steel producer using a snowball sampling approach (Robson, 2002). For the current research, subsidiaries of the focal firm and its first-tier upstream and downstream supply chain partners were identified. Contacts from the first-tier partners were used to identify second-tier partners. The key informant method (Phillips, 1981) was used to select a top manager in each company with deep knowledge of supply chain operations. Respondents were asked to answer the questionnaire on the basis of the supply chain partnership with the focal firm or, in the case of second-tier supply chain firms, in relation to the most important or strategic partner they were supplying to or purchasing from within the focal firm’s supply network (cf., Cousins et al., 2008).

We adopted items for trust from Doney and Cannon (1997) and Krause and Ellram (1997), items for availability of alternatives (reverse coded) from (Ganesan, 1994), and items for restraint in the use of power from (Heide and Miner, 1992). Items of supply chain partnership synergy were adopted from (Hult et al., 2004) and (Spekman et al., 2002). All these variables were measured using a 7-point Likert-type scale. For supply chain performance, we adopted the conceptual framework proposed by Gunasekaran et al. (2001) to developed a 14 item measurement, based on four in-depth interviews with the appropriate senior managers of the focal firm and two field experts. Following the approach of previous researchers (Murray et al., 1995), respondents were asked to rate their performance relative to their major competitors for each performance indicator along a 7-point Likert-type scale, where 1 = far below, 7 = far above. As suggested by Murray et al. (1995), under the assumption of linearity, a summated measure cancels out the random error of individual items, and better reflects the underlying construct.
Therefore, the supply chain performance items were summed together into a single response variable (labelled SCPFRM) to measure the supply chain performance of the responding firm.

To assure face and content validity, ten pilot interviews about the questionnaire were conducted with expert academics and practising managers in the UK and China. Since the final questionnaire was presented in Chinese, a translation-back-translation process was undertaken to ensure consistency in meanings (Kim and Lim, 1999).

ANALYSIS AND RESULTS

We received 413 usable questionnaires. The responding firms’ sizes ranged from small to large, and the majority were consumers or suppliers of steel-related products. The threat of common method bias to the data was checked using Harman’s (1967) one-factor test. The resulting principal component analysis returned six distinct factors with eigenvalues greater than 1, which accounted for 67.8% of the variance and the first factor accounted for 35.4% of the variance. The results hence led us to conclude that common method bias was not a problem.

Before structural equation model was constructed, confirmatory factor analysis (CFA) was used to examine the reliability and validity of the survey instrument. The measurement model was constructed (using LISREL 8.7 (Joreskog and Sorbom, 2004)) with the four latent variables, trust (TRUST), availability of alternatives (ALTRN), restraint in the use of power (RSTPW), and supply chain partnership synergy (SCPS). The analysis used robust maximum likelihood (RML) as the main estimation method (Browne, 1987). A scaled chi-square test statistic $S - B \chi^2$ was used as an indication of goodness of fit, which behaves extremely well in nearly every condition across sample size, distribution and model specification (Mels, 2004).

We followed Fornell and Larcher (1981), to establish convergent validity the constructs have to demonstrate the following properties: (1) all factor loadings must be significant and exceed 0.70; (2) construct reliabilities must exceed 0.70; (3) the AVE (average variance extracted) by each construct must exceed the variance due to measurement error for that construct (i.e., AVE must exceed 0.50). To establish discriminant validity, AVE for each construct should exceed the squared factor correlations between that construct and other constructs. After one round of item assessment and deletion, a satisfactory measurement model was achieved. All of the conditions were met and the convergent and discriminant validity of the instrument was deemed acceptable.

A structural equation model of the conceptual model shown in Figure 1 was constructed to test the research hypotheses. The model fit indices demonstrated acceptable model fit to the data ($S - B \chi^2/df = 2.96$; CFI = 0.98; IFI = 0.98; NNFI = 0.98; RMSEA = 0.069).

As shown in Table 1, the estimated path coefficients between trust and partnership synergy and between availability of alternatives and partnership synergy were all significant, and with a positive value of 0.76 and a negative value of 0.18, alternatively. Hypothesis 1 and 2 were therefore supported. Moreover, the estimated path coefficient between partnership synergy and supply chain performance was significant with a positive value of 0.46. Therefore, hypothesis 4 was also supported. However, hypothesis 3 was not supported, since the estimated path coefficient was not significant for the paths between restraint in the use of power and partnership synergy.

To evaluate the interaction between trust and indicators of relative power (availability of alternatives and restraint in the use of power), the two-step procedure of (Ping, 1995) was followed. Two latent products were generated (i.e., TRUST*ALTRN, TRUST*RSTPW). First, loadings and errors of the latent variables were obtained from the additive measurement model
(i.e. the measurement model without the latent product). Second, these values were used to calculate the loadings and error terms of the latent product, which were then used to fix the paths associated with the latent product in the interaction model (Ping, 1995). As shown in Table 2 and 3, two interaction models were conducted. Both models have shown acceptable model fit.

**Table 1 – Results of structural equation modelling: standardized path coefficients (t-value)**

<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>TRUST</th>
<th>ALTRN</th>
<th>RSTPW</th>
<th>SCPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnership Synergy</td>
<td>0.76*** (7.64)</td>
<td>-0.18*** (-3.75)</td>
<td>-0.01 (-0.11)</td>
<td>–</td>
</tr>
<tr>
<td>Supply Chain Performance</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.46*** (9.88)</td>
</tr>
</tbody>
</table>

Notes: n=413. *** Significant path estimates.
Model fit indices: Satorra-Bentler scaled $\chi^2 = 541.36$, df = 183; S-B $\chi^2$/df = 2.96; CFI = 0.98; IFI = 0.98; NNFI = 0.98; RMSEA = 0.069.

**Table 2 – Results of structural equation modelling with latent product (TRUST*ALTRN): standardized path coefficients (t-value)**

<table>
<thead>
<tr>
<th>Latent variables</th>
<th>TRUST</th>
<th>ALTRN</th>
<th>RSTPW</th>
<th>TRUST*ALTRN</th>
<th>SCPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnership Synergy</td>
<td>0.36*** (4.46)</td>
<td>-0.56*** (-13.63)</td>
<td>0.04 (0.58)</td>
<td>0.35*** (8.76)</td>
<td>–</td>
</tr>
<tr>
<td>Supply Chain Performance</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.52*** (13.73)</td>
</tr>
</tbody>
</table>

Notes: n = 413. *** Significant path estimates.
Model fit indices: Satorra–Bentler scaled $\chi^2 = 749.85$, df = 203; S-B $\chi^2$/df = 3.69; CFI = 0.98; IFI = 0.98; NNFI = 0.97; RMSEA = 0.081.

**Table 3 – Results of structural equation modelling with latent product (TRUST*RSTPW): standardized path coefficients (t-value)**

<table>
<thead>
<tr>
<th>Latent variables</th>
<th>TRUST</th>
<th>ALTRN</th>
<th>RSTPW</th>
<th>TRUST*RSTPW</th>
<th>SCPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnership Synergy</td>
<td>0.67*** (8.88)</td>
<td>-0.13*** (-3.40)</td>
<td>0.18*** (2.54)</td>
<td>-0.26*** (-12.26)</td>
<td>–</td>
</tr>
<tr>
<td>Supply Chain Performance</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.57*** (17.83)</td>
</tr>
</tbody>
</table>

Notes: n = 413. *** Significant path estimates.
Model fit indices: Satorra–Bentler scaled $\chi^2 = 801.81$, df = 203; S-B $\chi^2$/df = 3.95; CFI = 0.98; IFI = 0.98; NNFI = 0.97; RMSEA = 0.085.

For the interaction model between trust and availability of alternatives, the latent product (TRUST*ALTRN) showed a positive effect on partnership synergy with a significant value of 0.35, suggesting there is an interaction effect of trust and availability of alternatives on the partnership synergy. Figure 2 presents the plot of interaction based on the standardized path coefficients. It can be seen that when trust is at a lower level, the availability of alternatives in the partnership has a steep negative effect on the partnership synergy. However, when trust is at a higher level, the availability of alternatives in the partnership has a much less clear effect on the partnership synergy. Therefore, hypothesis 5 was supported.

For the interaction model between trust and restraint in the use of power, the path estimates between restraint in the use of power and partnership synergy became positive and significant. The latent product (TRUST*RSTPW) showed a negative effect on the partnership synergy with a significant value of -0.26, suggesting there is an interaction effect of trust and restraint in the use of power on the partnership synergy. As shown in the plot of interaction (Figure 3), when trust is at
a lower level, the restraint in the use of power in the partnership has a steep positive relationship with the partnership synergy. However, when trust is at a higher level, the effect of restraint in the use of power on the supply chain performance became negative but such effect is much less clear. Therefore, hypothesis 6 was supported.

**DISCUSSION AND CONCLUSION**

The result of this study confirms that improved synergy between supply chain partners will lead to better supply chain performance, which is in line with previous literature (e.g., Srinivasan et al., 2011). As expected, higher level of trust will contribute to the synergetic relationship between supply chain partners, which offers further evidence to the previous research (e.g., Lawson et al., 2008). Moreover, the availability of more alternatives by the focal firm reduces the synergy between partners. This suggests that having more alternative partners contributes to the possession of relative power by the focal firm, which reduces its commitment to the partnership and the level of shared understandings and congruence with its supply chain partner.

Our findings indicate that the controllable element of power, namely a policy of voluntary restraint in the use of power, has no direct influence on supply chain partnership synergy. However, it is more important when it is interacting with the level of trust in the supply chain.
partnership. Likewise, our findings also indicates clear interaction between availability of alternatives and trust, as indicated by the steep slopes of the interaction lines at low trust levels as shown in figure 2 and figure 3. What we found is that the influence of both power elements (availability of alternatives and restraint in the use of power) are more significant in low trusted partnerships.

The presence of interactions between trust and indicators of relative power suggests that, where the level of inter-firm trust is low in a supply chain partnership, the role of relative power becomes very important for the creation of partnership synergy. The limited attachment to the partnership due to the lack of relational capital signifies the importance of power structure. Whether the partnership has unbalanced power and how that power will be used will make a big difference to the ongoing supply chain collaboration.

On the other hand, when the level of inter-firm trust is high, the impact of relative power becomes much less significant. The presence of bigger relational capital reduces the importance of power structure in the partnership. The high level of trust neutralizes the adverse effects of relative power and ensures collaborative relationships of the partners regardless of whether a partner possesses relative power due to having alternative choices or whether the power usage will be restrained in the relationship. Our findings show that in a highly trusted partnership, usage of power could even be constructive to the operation of the supply chain. From this perspective, because the existence of unbalanced relative power in a inter-firm relationships is very common, it is reasonable to argue that a high level of inter-firm trust is still the most important relational capital factor in order to foster supply chain partnerships (Cousins et al., 2006).

Bibliography


Fornell, C., and Larcker, D. F. 1981. 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, 18(1), 39-50.


Hult, G. T. M., Ketchen, D. J., and Slater, S. F. 2004. 'Information processing, knowledge development, and


