A conceptual model for the measurement of the expected value of a supply chain relationship

James S. Keebler* and Craig A. Hill

Department of Management,
Supply Chain Management,
College of Business,
Clayton State University,
2000 Clayton State Blvd,
Morrow, Georgia,30260-0285, USA
Fax: +01-678-466-4599
E-mail: JamesKeebler@clayton.edu
E-mail: CraigHill@clayton.edu
*Corresponding author

Seong-Jong Joo

Hasan School of Business,
Colorado State University-Pueblo,
2200 Bonforte Blvd.,
Pueblo, CO 81001, USA
Fax: (719) 549-2909
E-mail: seongjong.joo@colostate-pueblo.edu

Abstract: The objective of this research paper is to describe a conceptual framework for evaluating the expected value of supply chain relationships (EVSCR). Various types of supply chain relationships are defined in the literature. Then borrowing basic valuation concepts from finance theory, a supply chain relationship valuation model is developed. Valuation components and synergy effects are quantified along two dimensions of the relationship – resource complementarity and cooperative effectiveness. The EVSCR model permits the categorisation of five types of business connections and suggests strategies to improve relationships. Firms can predict the value of potential supply chain relationships, better describe the value of existing relationships, and make informed decisions for management action to improve marginal relationships. This valuation framework is new to the supply chain literature and serves to expand the set of tools available to planners and managers to quantify existing and desirable supply chain relationships needed to improve supply chain performance.

Keywords: supply chain management; supply chain relationships; valuation model; expected value of relationships.

1 Introduction

The fundamental element of a supply chain is the single firm, which both buys from a supplier and sells to a customer. The focal firm’s buying activity establishes a linkage to the supplier’s selling activity and its selling activity links to the customer’s buying activity. Thus, the linkages formed by a single firm in a supply chain include at least three or more firms. To achieve the proper balance in both supply and demand, or inputs and outputs, each firm in the supply chain must, at a minimum, coordinate the activities of the triad it has established. Selection of customer and supplier relationships is but one of the key strategic choices a firm makes. The selection of these relationships requires some consideration of the value each relationship choice offers to the firm.

Globalisation of the world economy has increased the formation of supply chain relationships. A company needs to effectively manage the timely and effective flow of goods from its suppliers to its customers through a variety of well-chosen relationships. Partnerships and alliances require complementary resources and a high degree of mutual cooperation to produce the intended outcomes with synergistic effects.

Supply chain relationships have been historically categorised in the literature by where they fall on a governance spectrum. The channels literature was the first to propose...
A conceptual model for the measurement of the expected value

45

a range of relationships, from arm’s-length transactions (or market governance) to vertical integration (or hierarchical governance).

In this paper we apply some basic valuation concepts from modern finance theory to the formation and value-creation of supply chain relationships where some degree of mutual governance, or interfirn-cooperation, exists between the firms. We propose and apply the measure of effective contribution coefficient to calculate the value contributed by each firm in the relationship. We categorise these relationships into five broad types according to two dimensions of the characteristics of the firms in the relationship: resource complementarity and cooperative effectiveness.

We develop the expected value of a supply chain relationship (EVSCR) model and apply the model to describe five categories of business combinations. The simple valuation model provides the supply chain strategist a straightforward framework for analysing the merits of a proposed mutually governed business relationship. We also suggest ways managers can improve and maximise the value of a given business connection.

In the following section we briefly review related literature on business relationships. We develop the valuation model and describe the five resulting types of relationships. We then analyse the valuation implications of these types of business connection. We conclude with a summary.

2 Types of supply chain relationships

Generally, there are two types of supply chain relationships: vertical and horizontal (Coyle et al., 2009). Vertical relationships are the traditional linkages in the supply chain among the buyers and sellers, such as retailers, distributors, manufacturers, and parts and materials suppliers. Indeed, supply chains are formed from the many triads (buyer/seller) (buyer/seller) (buyer/seller) which link original sources to ultimate consumers. Each link in the chain, comprised of each company that buys on one side and sells on the other, must recognise the cost and value realised at the very end of the supply chain, and collaborates to sustain and enhance the value delivered to consumers. Marketing channel decisions and distribution channel decisions involve assessing ‘make or buy’ propositions as well as the complementarity of these chosen relationships.

A second type of supply chain relationship is horizontal in nature and includes those business agreements between firms that have ‘parallel’ or cooperating positions, such as alliances. As independent firms, they agree to work together to gain mutual benefits. These could be buyer to buyer, seller to seller, and in some cases, competitive relationships. Examples include different hospitals pooling their purchasing requirements, different growers pooling their selling efforts, a warehousing company working with a transportation company, or two transportation companies joining forces, such as in intermodal offerings. In those situations where mutual governance or interfirn cooperation exists to jointly create value in vertical or horizontal relationships, an approach to understanding the value of these associations would be helpful.

The most commonly discussed categories of relationship structure types found in the literature are arm’s length, cooperative relationships (which include those that are administered or governed by contracts), and integration. There seems to be no disagreement about the categories on the ends – arm’s length consists of discrete transactions (Contractor and Lorange, 1988; Heide, 1994; Nevin, 1995; Webster, 1992),
and integration is one firm (vertical integration), or several firms acting as one (supply chain management), performing all channel functions (Harland, 1996; Heide, 1994; Landeros and Monczka, 1989; Mentzer et al., 2001).

Cooperative relationships are not as clearly defined in the literature. Partnerships and alliances are the terms most often used for these types in the logistics literature. While there is some agreement that these descriptors mean working together toward common goals and sharing investments and risks, the definitions vary (Ellram, 1991; Lorange et al., 1992; Webster, 1992; Cravens et al., 1993; Lambert et al., 1996; Stern et al., 1996; Cooper et al., 1997; Lambe and Spekman, 1997; Das and Teng, 1998; Monczka et al., 1998; Hoyt and Huq, 2000; Boddy et al., 2000).

Mentzer et al. (2001) state that relationships vary on their levels of trust, commitment, mutual dependence, organisational compatibility, vision, leadership, and top management support; the higher the levels of these, the closer the firms are to an integrated relationship. Cannon and Perreault (1997) differentiated their types based on the characteristics of expectations for information sharing, degree to which operations are linked, contractual agreements, expectations about working together, and relationship-specific adaptations by the seller or buyer. Rinehart et al. (2002) used trust, commitment, and the frequency of interaction. Dabholkar and Neeley (1998) categorise business-to-business relationships on a temporal perspective (long-term versus short-term), goal orientation (individual gain versus joint gain), and power (balanced versus unbalanced). According to Boyle et al. (1992, p.464), types “vary in the inclusiveness of goals, the locus of decision-making, the scope of supervision and control, commitment to the system, and the formality of roles and division of labor”; and these characteristics are thought to be the highest in integrated relationships. Landeros and Monczka (1989) described cooperative relationships as differing from the relationship spectrum ends based on five attributes – the supply pool, a credible commitment, joint problem solving, an exchange of information, and joint adjustment to market conditions.

Partnership agreements can be distinguished along several dimensions. For example, they differ in terms of their degree of resource investments (Auster, 1992), or administrative control (Killing, 1983). Joint ventures are defined as new operating entities resulting from the combination of complementary resources by distinct firms which share ownership and control for the venture (Harrigan, 1985). Licensing agreements occur when one firm sells the rights to use that firm’s technology or intellectual properties to another firm. Tacit technological knowledge is less likely to be transferred through licensing agreements than with joint ventures, because the parties are not linked through common ownership (Hennart, 1988).

Marketing Agreements are defined as partnerships where one firm takes responsibility for the marketing and/or distribution of another firm’s products (Dutta and Weiss, 1997). The supply chain management literature includes three types of marketing agreements: third-party logistics providers (3PLs), retailer-supplier partnerships (RSPs), and distributor integration (DI) (Simchi-Levi et al., 2003). 3PLs is simply the use of an outside company to perform all or a part of the firm’s materials management and product distribution functions. 3PL relationships are typically more complex and more strategic than traditional logistics supplier relationships. Advanced information systems allow the RSPs to leverage the knowledge of both parties. Using technologies of point-of-sale data capture and electronic data interchange, the RSPs enjoy the shared benefits of quick-response, continuous replenishment, and vendor-managed inventories. Some
industrial firms have learned to treat their independent distributors as partners. DI provides for sharing information, and even inventories, across the network of relationships. Under DI, each distributor can check the inventory of other distributors to locate a needed product or part. The distributors are contractually bound to exchange the product or part under certain conditions and for agreed-upon remuneration. Contract manufacturing is a relationship strategy employed by firms who attempt to specialise in their areas of competitive advantage, or where differing costs of capital dictate. Figure 1 describes the possible supply chain relationships found in the literature.

Figure 1 Supply chain relationship types based on the literature

<table>
<thead>
<tr>
<th>Market Governance</th>
<th>(1) Vertical (Buyer/Seller) Relationships</th>
<th>(2) Horizontal (Business Alliance) Relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms Length</td>
<td>Vertical Governance</td>
<td>Horizontal Governance</td>
</tr>
<tr>
<td>Transaction</td>
<td>Weak</td>
<td>Strong</td>
</tr>
<tr>
<td>Specific, No</td>
<td>Supportive</td>
<td>Control through Collaborative Relationships</td>
</tr>
<tr>
<td>Relationship</td>
<td>Pooling of Interests</td>
<td>3PLs</td>
</tr>
<tr>
<td></td>
<td>Strategic Alliance</td>
<td>Contract Manufacturing</td>
</tr>
<tr>
<td></td>
<td>Joint Venture</td>
<td>Licensing</td>
</tr>
<tr>
<td></td>
<td>Ownership For Control</td>
<td>Associations</td>
</tr>
</tbody>
</table>

Santoro (2000) conducted research on the link between relationship intensity and outcomes in industry-university ventures. The concept of intensity is an important one for practitioners, who must decide what amount of time, effort, and investment they should put into any given relationship. Different benefits will be achieved from different intensities. Firms need to be aware of the possible costs and benefits from different relationship intensities in order to subsequently measure the value (i.e., benefits/costs) of their relationships (Mentzer, 2004). Concepts similar to intensity are found in the marketing, management, and sociology literature. Rindfleisch and Moorman (2001) discuss the concept of relational embeddedness as the degree of reciprocity and closeness among new-product alliance participants. This concept is based on the strength-of-ties literature, which is primarily concerned with the nature of the relational bond between two or more social actors. Tie-strength researchers typically classify the relation as linked by a strong or weak tie. Strong ties are viewed as having higher levels of closeness, reciprocity, and indebtedness than weak ties (Granovetter, 1973).

Relationship intensity is a component of supply chain relationship structure. In his work on social networks, Gulati (1998) suggests that alliances characterised by a high degree of relational embeddedness (i.e., the companies in the alliance are strongly tied to each other) display high levels of cooperation. Spekman et al. (1998) propose that relationships get closer as companies move from open market transactions to collaboration – trading parties can cooperate and coordinate certain activities but still not behave as close trading partners requiring high levels of trust and commitment.
Supply chain management is a cost-effective alternative to vertical integration, achieved through external collaboration, coordination and integration based on forged relationships (Stank et al., 2001; Fawcett and Magnan, 2002; Chen et al., 2008). Supply chain managers must understand both the facilitators of collaboration (Richey et al., 2007) as well as the inhibitors of collaboration (Ellinger et al., 2006). Successful collaborations result in effective transfer and sharing of risk (Spekman and Davis 2004; Manuj and Mentzer, 2008).

Because there are so many different relational combinations of type, intensity and duration that firms can implement within their supply chains, the lack of a common understanding of what a particular relationship with another company entails can lead to problems. Consequently, a need exists to determine the benefits, or value, of any prospective, cooperative, supply chain relationship.

3 Developing the relationship value model

Finance theory suggests the following formulation for the calculation of the franchise value of a firm ($V^F$):

$$V^F = Value\ of\ Assets-in-place + Value\ of\ Growth\ opportunities.$$  
(1)

For many companies, a large part of their value derives from future growth opportunities. When two companies form a cooperative business combination such as a trading partnership or business alliance, each company brings into the relationship both components of basic value and growth opportunities. In fact, the primary objective of most partnerships is to generate additional value. In other words, synergy is nothing more than value-creation based on a fresh combination of competitive business factors.

We define the maximum value of a partnership $V_{P,\text{MAX}}^F$ as:

$$V_{P,\text{MAX}}^F = \gamma_A V_A^F + \gamma_B V_B^F + V_{S,\text{MAX}}$$  
(2)

where $V_A^F$ and $V_B^F$ are the individual asset values of the two partner firms, $\gamma_A$ and $\gamma_B$ are the committed share of each partner firm to the partnership, and $V_{S,\text{MAX}}$ is the maximum synergy obtainable from the combination.

In a trading partnership or business alliance, each party brings their respective share of committed resources: financial, technological, managerial and other human resources, marketing know-how, their corporate network and other connections, among others. The total value of these resources can be individually estimated for each party for its contribution to the total resource of the partnership. Beyond the stand-alone value of the separate resources, however, practically all partnerships and alliances are designed to generate synergy.

$V_S$ is the value created by the unique combination of the complementary characteristics of the two partner firms. The uniqueness of such combination drives the synergistically created value. This is an important element of this model. Redundant resources obviously cannot generate additional value.

We next define the effective contribution coefficient $\eta$:

$$\eta = I^*/I \text{ for } 1 \geq \eta \geq 0.$$
I is the planned percentage of investment of the value of available resources (up to 100%), and \( I^* \) is the incremental expected increase in the value of the resource investment (up to 100%). Here investment is broadly defined to include financial, technological, human resource and managerial, location, marketing, and all other value-creating resources or activities. The effective contribution coefficient \( \eta \) measures the effective contribution of each partner and of the joint effort of the two partners. When \( \eta \) is high, the partnership realises a large fraction of the value of contributed resources. When \( \eta \) is low, the partnership wastes a large fraction of the potential value of contributed resources.

Conceptually, due to the suboptimisation of efficiency and effectiveness in executing corporate operations, there will be systemic disharmony, or friction, that creates some degree of waste. It is important to note that \( \eta \) can be low for a variety of reasons. Even in cases with the best intentions and maximum effort, there can still be wasteful activities. In cases with less than an optimal partner match and structure, such wasteful activities could be substantial. In the sinister case of an antagonistic partnership, as discussed in more detail later, a low \( \eta \) can be intentional. On a different dimension, miscommunication, ineffective coordination, and mismanagement of the partnership all contribute to a low \( \eta \).

Given the natural friction, \( \eta \) would always be below 1.0. Whether a partnership realises a high degree of its potential value, however, depends on both the characteristics of the partner firms and how well they function together.

4 EVSCR model

We can now measure the expected value of a supply chain as a function of the potential values and the Effective Contribution Coefficients.

\[ V_{p} = \eta_{A} \times \eta_{B} \times V_{A}^F + \eta_{B} \times V_{B}^F + \eta_{p} \times V_{S}^{MAX} \]

\[ = ECI_{A} + ECI_{B} + S. \]

\[ \eta_{p} = \eta_{A} \times \eta_{B} \times \eta_{C}. \]

\( ECI \)'s are the effective contribution investment by the two partners and \( S \) is the expected synergy. Note that \( \eta_{p} \) is the product of three coefficients. \( \eta_{A} \) and \( \eta_{B} \) are the effective contribution coefficients of the two partner firms. \( \eta_{C} \) is the partnership effective cooperation/coordination coefficient, and measures how well the partnership functions, subject to the influences from both partner firms. The effect of inefficiency on the parts of one or both partners is multiplicative.

A scenario illustrating application of the EVSCR model: a warehousing company (A) with excess capacity serves a local market with a service area of 25 miles, operating only a few trucks to effect pick-up and delivery. The company is considering a strategic partnership with a transportation company that could extend its service area up to 200 miles, providing for same-day service in a much larger area. Company A has identified three possible transportation firms with the ability and interest to create the partnership, Companies B, C, and D, respectively. After several meetings with the three
prospects, Company A has created a table of the estimated values of the contributions negotiated with each transportation company.

**Table 1** Estimated values

<table>
<thead>
<tr>
<th>Asset value</th>
<th>Committed share</th>
<th>Effective contribution coefficient</th>
<th>Estimated synergy</th>
<th>Partnership effective coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>((V^f))</td>
<td>((\gamma_A))</td>
<td>((\eta))</td>
<td>((V_s^{max}))</td>
<td>((\eta_s))</td>
</tr>
<tr>
<td>Warehouse Company A</td>
<td>$8,000,000</td>
<td>.25</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>Transportation Company B</td>
<td>$4,000,000</td>
<td>.15</td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td>Transportation Company C</td>
<td>$6,000,000</td>
<td>.08</td>
<td>.70</td>
<td></td>
</tr>
<tr>
<td>Transportation Company D</td>
<td>$10,000,000</td>
<td>.04</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>Partnership A + B</td>
<td>$500,000</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partnership A + C</td>
<td>$800,000</td>
<td>.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partnership A + D</td>
<td>$1,200,000</td>
<td>.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Applying the model using equations (3), the calculation of the expected value of the partnership (A + B) is as follows:

\[
V_p = \eta_A \cdot \gamma_A \cdot V^f_A + \eta_B \cdot \gamma_B \cdot V^f_B + \eta_P \cdot V^{MAX}_S = ECI_A + ECI_B + S
\]

where

\[
\eta_P = \eta_A \cdot \eta_B \cdot \eta_C = .75 \cdot .80 \cdot .75 = .45
\]

Similarly, the value of Partnership (A + C) is $2,172,000 and the value of partnership (A + D) is $2,272,500.

In an ideal relationship (a complete, 100% efficient and effective partnership), we would have:

\[
\gamma_A = \gamma_B = \eta_A = \eta_B = \eta_C = \eta_P = 1.0.
\]

In this case, there is no waste of resources, and all synergy is captured. The value of the newly established relationship will be:

\[
V^{MAX}_p = V^f_A + V^f_B + V^{MAX}_S = (A_A + G_A) + (A_B + G_B) + G_{A+B}.
\]
The $A$’s are the value of assets-in-place for the partner firms, and the $G$’s are the value of their respective growth opportunities. Note that $G_{A+B}$ is the value of the growth opportunities generated by the (new) unique combination of the complementary characteristics of the two individual firms. $G_{A+B}$ is a direct function of the resource complementarity of the two partner firms. This construct has been explicated in the management literature (Song et al., 2005; Harrison et al., 2001) and refers to the degree to which one relationship compliments the other.

The only raison d’etre of either a partnership or alliance is to generate synergy, or additional value that was not obtainable before the partnership or alliance was established. Such synergy can only arise out of new joint-working of distinct but complementary characteristics of the two parties. It is also important to realise the multiplicative effect of the individual contribution from the partners. If one partner contributes 100% and the other none, there will be no synergy.

In the next section, we further develop the implications of our EVSCR Model, with two dimensions selected for measuring its success – resource complementarity and cooperative effectiveness. We describe the five relationship types resulting from the EVSCP model.

**Figure 2** Relationship types based on the EVSCR model
5 Five types of supply chain relationships

Having developed a simple formulation of the value of a partnership, we discuss five types of a relationship based on two dimensions of the relationship combination. First, we measure partnering firms on a scale of their resource complementarity, ranging from 1, when the partners are highly complementary, to 0, when the partners are highly similar and are direct, identical competitors in all ways. Second, we measure the cooperative effectiveness of the partnership, ranging from 1, for fully committed and well-managed relationships, to 0, for highly uncommitted and mismanaged relationships. Figure 2 illustrates where partnerships fall on a plot of the two measures.

The two variables measure two distinct but equally critical dimensions of the successfulness of a partnership. Cooperative effectiveness is a composite index of the combined effect of important factors such as partner commitment, managerial style disparity, national and corporate cultural difference, goal incongruity, structural deficiency, and miscommunication, among others.

The coefficient $\eta$ above is a proxy measure of this dimension of a partnership. Although our discussion here is framed in terms of the management of the partnership, the final impact is on valuation. The definition of $\eta$ above reflects the net valuation effect that ultimately arises out of the managerial aspects of cooperative effectiveness.

The fact that $\eta$’s affect the value of the partnership in a multiplicative way highlights the importance of the degree of effective cooperation and coordination from both partners. In a worst case scenario, when $\eta$’s are 0 for both partners, the value of the partnership would also be 0. One would be arguably correct to suggest that even physical assets are valueless when they achieve no tangible value creation.

The second dimension, resource complementarity, measures the opportunity for synergy, without which a partnership does not create additional value. It is important to note that complementarity can arise in many ways in a business alliance. Firms could be complementary in areas such as dominant markets, managerial skills, human resources, technological know-how, financial capacity, and intellectual capital, among others. Viewed this way, even competitors could form and have formed viable partnerships when complementarity is present in any one or more of the listed dimensions.

Resource complementarity directly affects the availability and magnitude of the partnership growth opportunities, as shown in equation (4). We next discuss the five types of resulting business combinations.

5.1 Synergistic partnership

Such partnerships are characterised by high complementarity of resources between the two partner firms. Both partners effectively cooperate with each other, and the partnership is well-managed. In such synergistic cases, we would have high $\eta$’s. In an ideal case, $\eta_A = \eta_B = \eta_C = \eta_P = 1.0$. Applying equation (3), we have:

$$V = \eta_A \gamma_A \gamma F + \eta_B \gamma B \gamma F + \eta_P \gamma P \gamma F$$

$$= \gamma_A \gamma F + \gamma B \gamma F + \gamma P \gamma F$$

The investment contributed from both firms as well as the maximum synergy are all fully realised. As $\eta$’s are all 1.0, there is no wasteful activity in the partnership.
In reality, such ideal case would be improbable. The value of the partnership is dependent on where in quadrant (Section 5.1) the partnership falls. The closer it is to the northwest corner, the more valuable the partnership will be.

5.2 Redundant partnership

Formed by highly similar firms (very low complementarity), this group of relationships differs from the Synergistic type in having less complimentary resources. Although potential synergy is low, there are few managerial problems.

Applying equation (3), with potential synergy $V_S$ close to 0, but $\eta$’s high, we have:

\[ V_P = \eta_A \cdot \gamma_A \cdot V_A^\rho + \eta_B \cdot \gamma_B \cdot V_B^\rho + \eta_P \cdot V_S \]

\[ \geq 1.0 \cdot (\gamma_A \cdot V_A^\rho + \gamma_B \cdot V_B^\rho ) + 1.0 \cdot V_S \]

\[ = 1.0 \cdot (\gamma_A \cdot V_A^\rho + \gamma_B \cdot V_B^\rho ) + 1.0 \cdot 0 \]

\[ = (\gamma_A \cdot V_A^\rho + \gamma_B \cdot V_B^\rho ) \]

With $\eta$’s high (1.0 in the equation above), these partnerships maintain most of the potential value of the contributed investments of the partner firms to the partnership. Beyond that, there is little synergy to speak of. With little synergistic gain, however, there is no strong economical/financial incentive to sustain the partnership. This type of partnership may be an honest and amicable truce between competitors. Given that, the likelihood of merger is certainly present.

Although legally it would be challenged, such a merger or partnership may result in reduction of competition and thus generate oligopolistic gain. Such gain is distinct from the growth opportunities or the synergistic growth opportunities discussed above. An anti-trust issue likely would prevent such a partnership from dominating the market place, making an oligopolistic gain more theoretical than real.

Since this type of partnership does not generate synergistic value, the partnership does not create additional value for the partners. This eventually may cause managerial problems. In other words, with the deficient foundation for synergy, this type of partnership cannot move west to quadrant (Section 5.1) and become Synergistic. It could, on the other hand, move south to quadrant (Section 5.4) and become the wasteful, perhaps destructive, Antagonistic type.

5.3 Ineffective partnership

These partnerships have good potential to become valuable. Endowed with high complementarity, these partnerships are ineffective due to low Cooperative Effectiveness. The problems of these partnerships are managerial and operational in nature and potentially can be corrected by improving communication and cooperation and minimising any cultural or operational conflicts.

Applying equation (3), we have:

\[ V_P = \eta_A \cdot \gamma_A \cdot V_A^\rho + \eta_B \cdot \gamma_B \cdot V_B^\rho + \eta_P \cdot V_S^{MAX} = 0.5 \cdot V_S^{MAX} \]

With $\eta$’s lower than 0.5, these partnerships only realise less than half of the potential value of the partnership. In particular, because of the multiplicative nature of $\eta_P(=\eta_A \cdot \eta_B \cdot \eta_C)$, only a small fraction of the potential synergy is realised. With the two
individual $\eta$’s low, $\eta_P$ is low even with a high $\eta_C$ ($\eta_P = \eta_A \cdot \eta_B \cdot \eta_C =< 0.5 \cdot 0.5 = 0.25$, assuming $\eta_C = 1$), which is unlikely.

It is important to note that as the nature of the relationship problem is managerial, it is possible for the firms to increase their cooperative effectiveness and move the partnership north into quadrant (Section 5.1) and become Synergistic.

5.4 Antagonistic partnership

Formed by highly similar firms (very low complementarity), possibly by competitors, these partnerships are very difficult to sustain. As cooperative effectiveness is low, managerial problems abound. Due to the competitive position of the partners outside the alliance, these managerial problems are potentially harder or impossible to resolve. Such partnerships are more economically wasteful than the redundant type. Given low complementarity, there is little synergy to be created from the Antagonistic partnership.

Applying equation (3), with potential synergy $V_S$ close to 0, we have:

$$V_P = \eta_A \cdot V^P_A + \eta_B \cdot V^P_B + \eta_P \cdot V_S$$
$$= 0.5 \cdot (\gamma_A \cdot V^F_A + \gamma_B \cdot V^F_B) + 0.25 \cdot V_S$$
$$= 0.5 \cdot (\gamma_A \cdot V^F_A + \gamma_B \cdot V^F_B).$$

With $\eta$’s lower than 0.5, these partnerships only realise less than half of the potential value of the contributed investments of the partner firms to the partnership. In addition, there is little synergy to speak of. Such partnerships are economically wasteful, and one would question the logic of their formation. One potential reason is competitive game playing, as a temporary truce between competitors, or as a part of competitive strategy. The two competing partners are antagonistic and the partnership is dysfunctional in management and deficient in the foundation for an effective partnership.

5.5 Inefficient partnership

With middle-of-the-road Cooperative Effectiveness and Complementarity, this group of partnerships is characterised by mediocre performance. The causes of the mediocre performance are both managerial as well as lack of synergistic value.

Applying equation (3), with potential synergy $V_S$ close to 0.5 of $V_S^{\text{MAX}}$, but $\eta$’s low, we have:

$$V_P = \eta_A \cdot V^P_A + \eta_B \cdot V^P_B + \eta_P \cdot V_S$$
$$= 0.5 \cdot (\gamma_A \cdot V^F_A + \gamma_B \cdot V^F_B) + 0.25 \cdot V_S^{\text{MAX}}$$
$$= 0.5 \cdot (\gamma_A \cdot V^F_A + \gamma_B \cdot V^F_B) + 0.25 \cdot V_S^{\text{MAX}}$$

With $\eta$’s around 0.5, these partnerships will maintain about half of the potential value of the contributed investments of the partner firms to the partnership. Beyond that, they will earn about a quarter of the maximum synergy obtainable. Increasing managerial effectiveness, say to close to 1.0, will increase the synergistic gain. However, $V_S^{\text{MAX}}$ will not be fully realised. Increasing managerial effectiveness also increases the expected or realised value.
6 Research limitations and managerial implications

The conceptual framework developed in this paper for assessing the potential or EVSCR has some practical limitations. First, the estimation of the values of assets and resources brought into the relationship can be difficult to approximate. Second, the commitment to or intensity of the parties in the relationship can vary over time, requiring a frequent recalculation of the relationship value. Third, the EVSCR model is more normative than positive in its application, suggesting preferred outcomes rather than exact, current values. Fourth, we did not include in the scope of this paper how those costs and benefits were to be determined or shared, but assume the benefits would exceed the costs for each party to justify the relationship. Some trading partner relationships are based on suggested or allowable mark-ups for resellers, conditioned by market forces. Some business alliances predetermine how the ‘gains’ will be shared. We feel that the determination of how costs and benefits should be shared was beyond the scope of the paper. Consequently, the EVSCR model would likely serve as an excellent planning tool for potential business combinations or associations, much like the use of the DuPont model (Cavinato, 1989; Keebler, 2000; Lambert and Burduroglu, 2000).

Another possible way to assess or approximate the EVSCR is measuring the efficiency of companies using data envelopment analysis (DEA), which computes comparative efficiency scores for companies or entities in a model. Some studies use this approach for evaluating the merger effect of companies (Cummins and Xie, 2008; Kwon et al., 2008). It is possible to evaluate the efficiency of companies before and after initiating their partnership by applying the revised models used by the merger studies. This method will continue to be developed in the future studies.

7 Conclusions and summary

The characterisation of supply chain relationships above has profound strategic implications for prospective partners. It is clear from the discussion that successful trading partnerships and business alliances tend to have high complementarity and high cooperative effectiveness. Deficiency in the complementarity dimension is particularly detrimental for the success of a relationship. These are cases where there are no economic grounds for a relationship. Deficiency in the cooperative effectiveness dimension simply requires the parties to work out the managerial problems, which could be diverse and complex.

We developed a model (EVSCR) to measure the value creation of trading partners and business alliances. The model is based on two dimensions of the relationship: resource complementarity and cooperative effectiveness of the partnering firms. The model provides a straightforward framework for evaluating the merits of a proposed partnership. It highlights the basis for synergistic value. It also provides a platform for improving and maximising the value of partnership.

Applying the EVSCR Model allows us to categorise supply chain relationships requiring mutual governance, or interfirm cooperation, into five basic types based on the two dimensions selected. We analysed and illustrated the merits and deficiencies, the sources and limitation of value, and above all, the economic/financial rationale for the formation of mutually governed relationships. This new conceptual model is useful for corporate strategists as well as managers in their evaluation of both proposed and existing
partnerships. Future research can be conducted to examine the empirical implications of our model.

References


A conceptual model for the measurement of the expected value


