Association for Information Systems

AIS Electronic Library (AISeL)

ICEB 2009 Proceedings

International Conference on Electronic Business (ICEB)

Winter 12-4-2009

The Selection Model for Compound or Portfolio Relationships Oriented in Supply Chain

Jao-Hong Cheng

Chih-Ming Lee

Follow this and additional works at: https://aisel.aisnet.org/iceb2009

THE SELECTION MODEL FOR COMPOUND OR PORTFOLIO RELATIONSHIPS ORIENTED IN SUPPLY CHAIN

Jao-Hong Cheng[1], Chih-Ming Lee[2]
Graduate Institute of Information ManagementNational Yunlin University of Science & Technology
123, Section 3, University Rd., Touliu, Yunlin County, TAIWAN, R.O.C
[1]jhcheng@yuntech.edu.tw, [2]g9723806@yuntech.edu.tw

Abstract

As the environment changed, the inter-organizat ional in Supply chain has been transferred fro m simple relations to complex relations "Comp ound or Portfolio Relationships". The main pur pose of this research is to integrate external/int ernal resource and maintain flexible volatility o f inter-organization for helping organizations/fir ms could increase the competitive advantage fo r them. To survey the current researches which discuss inter-organization in supply chain; it c ould be found that most literatures are focused on each simple relationship or portfolio relatio nship about their types and features. Our resear ch uses multiple relative theory and interviews to perform the research. To develop theory mo del and analyse the nature of relations about c ompound relationships oriented and portfolio rel ationships oriented. The theoretical framework model concerns the influence of the difference selection factors between inter-organizational in supply chain. We hope this research will cont ribute to further studies and provide some sugg estions for implementing management of the rel ationship between supply chains.

Keywords: Relations Oriented Selection model, Compound Relationship, Portfolio Relations, Logistic Regression, Discriminate Analysis

Introduction

With the rapidly change of business environment, the inter-organizational in Supply chain has been transferred from simple relations to complex relations. In past research on inter-organizational relationships in supply chain, lots of researchers have delved into organization development, history, partnership relations selection, relationship management, relations network formation or long-term relationship management issues. As mentioned earlier, we found that organization select which relation types will cause inter-organizational network connection and long-term relations. Furthermore, which relationship types would contribute to more benefits and synergy in an organization.

Lots of pasted researcher discussed that organization development, history, partnership relations selection, relationship management, relations network formation or long-term relationship management issues. According to current literature, we found there are two types of simple relationship in inter-organizational context, Compound Relationships & Portfolio Relations. Portfolio Relations provide a mechanism for conceptualizing and managing the customer, supplier and indirect sets of relationships which surround a firm. The relations linkage may be competitive, or cooperative. Each relations linkage will cause positive or negative effects. Compound Relationships defines these complex relationships (see Figure1). Formally, we define a compound relationship as being composed of two or more simple relationships between a pair of firms. We define simple relationships as separate and distinct relationships that occur between these same two firms, such as supplier to customer, competitor to competitor, or joint partners. Essentially, a compound relationship is the set of individual simple relationships between two firms.

Our research hope to build up a mechanism process to integrate external/internal resource and maintain flexibility of inter-organization to help organizations/firms could increase their own competitive advantage.

Literature review
Compound relationship

A relationship is a connection between two entities (entities can be organizations, people, societies, or even nation-states), such that the entities have explicit roles for which there are expected norms of behavior. Ross & Robinson narrow our thinking to the types of simple relationships that two firms may have with each other—for example, a supplier– customer relationship or a competitor–competitor relationship. [1]

FIGURE 1
The Compound Relationship and Its Component Relationships
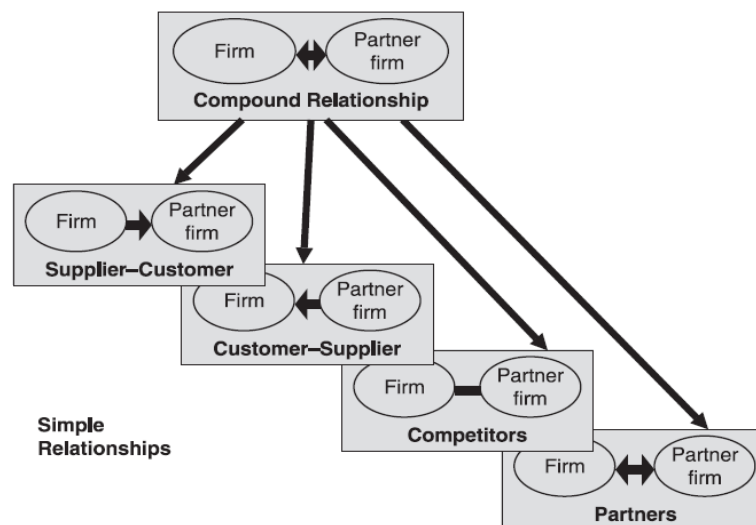
To understand this, consider a given firm and its relationships with another firm. Ross & Robinson categorize the simple relationships that it and the other firm might undertake into four basic types: customer to supplier, in which the firm buys a product or service from the partner firm; supplier to customer, in which the firm sells a product or service to the partner firm; competitor to competitor, in which the two firms compete with each other for some resource (e.g., customers); and partners, in which the two firms work together, formally or informally, to achieve a common goal.[1]

Each simple dyadic relationship that we have discussed can be envisioned as containing a political economy and existing within an environment in other simple relationships is a negligible part of the environment. Each firm must pay attention to its behavior with the other firm. Second, and conversely, performing well in one simple relationship may harm other simple relationships. Third, performing well in one simple relationship may lead to additional-relationships. Fig 1. Compound Relationship and its component [1]

Portfolio relationship
This externalization of value activities is dependent on creating strong supplier partnerships in those activities that have high strategic relevance for the customer firm. The externalization process is well documented and led hierarchical structures consisting of several tiers of suppliers forming complex supply chain networks. A relationship may also have an effect on other relationships. The majority of relationship portfolio models are based on customer or supplier relationship portfolio modeling. Moreover, indirect relationships often be analyzed and managed in the purpose for competitors. The best-known models include both two and three dimensional axes along with single, two and three phase analyses [2]. The most often cited relationship portfolio models include the ones by Fiocca, Campbell & Cunningham, Krapfel, Salmond & Spekman, Olsen & Ellram and Turnbull & Zolkiewski [2, 3, 4, 5, and 6].

The definition of interconnectedness points out another important characteristic of interconnectedness. Between any two relationships (x) and (y) there can be an affect of (x) on (y): "a relationship affects other relationships." At the same time there can be an effect of (y) on (x): "a relationship is affected by other relationships [7]". Thomas develop six different cases of interconnectedness between any two relationships [7]：

(1) Neutrality Effect: No interconnectedness between two relationships exists when the two relationships are totally independent. (2) Assistance Effect: A one-sided positive effect between two relationships can occur when experiences made in one relationship can be used in the other. (3) Hindrance Effect: If one relationship is hindering the other and there is no impact in the opposite direction, there is a one-sided negative effect. (4) Synergy Effect: Two-way positive effect means that both relationships support or even necessitate or presuppose each other. (5) Lack Effect: Between two relationships a positive and a negative impact can coexist. (6) Competition Effect: Two relationships can also weaken or even exclude each other. Thomas proposed that portfolio relationship

have some features. The following examples illustrate interconnectedness of relationships [7]:

System selling
Within the process of system selling, heterogeneous contributions of more than one company are brought together in order to provide a "complete" or "complex" solution to the customer. Taking computer systems as an example, hardware, software and installation as well as customizations or adaptations will be offered in one package to the customer by different, but cooperating companies.

Combination advantages
Combination advantages occur when companies allow access to, or pool, one another's (homogenous) resources.

Mediation
Companies can mediate inter-organizational relationships through actively promoting the relationship initiation process between two companies (e.g., the European Commission pays mediators which initiate inter-organizational cooperation's within the SPRINT network).

Surety
Like the previous examples, surety can only be understood by analyzing at least three parties. In an industrial setting, a surety can be given by one actor for enabling two other actors to do business together.

The interact factors for compound or portfolio relationship
Dominate relationships
An issue to consider is which of the simple relationships that constitute a compound relationship is likely to be more important than the others. Ross & Robinson (2007) expected that the dominant simple relationship between the two firms is the competitor–competitor relationship and that the supplier–customer relationship is less important, though this may change with time and changing market circumstances [1].
The first of these, and we speculate the strongest, is path dependence [8], expressed in this case in the primacy of the original relationship. Two firms that began with a certain relationship (e.g., supplier to customer or competitor to competitor) may find it difficult to introduce norms that are appropriate to other simple relationships into the compound relationship. The other two factors are perhaps more rational; they consider the economic and strategic realities of the various simple relationships. There may be other factors that influence which simple relationship is the dominant

relationship, but we believe that these three are especially important ones.
H1: The dominant relationships are positively effect the selection of compound relationships and negatively effect selection of portfolio relationships.

Relations stability
Relationship stability is a consistent reflection of dyadic favorable relational attitudes in an active working relationship which continues for a period of time.

Bidirectional Relationship
The two firms might simply be influencing each other in one simple relationship (e.g., a partner relationship in which influence is bidirectional). Anderson & Narus (1990) proposed that Bidirectional relationship [9].

Long-term Relationships
In the present study, two firms build trust to sustain interfirm long-term relationship development. On the other interfirm trust will decrease the partnership to against the opportunism [10]. The literature on trust suggests that confidence on the part of the trusting party results from the firm belief that the trustworthy party is reliable and has high integrity. Essentially, future interaction between exchange partners provides an opportunity to reward good behavior and punish opportunism [11].

Relative Powers
All relationships have power levels; that is, the two firms in the relationship each have some power [1].
H2-1: Bidirectional relationships are positively effect the selection of compound relationships and negatively effect selection of portfolio relationships.
H2-2: Long-term relationships are positively effect the selection of compound relationships and negatively effect selection of portfolio relationships.
H2-3: Relative powers are positively effect the selection of compound relationships and negatively effect selection of portfolio relationships.

Relational Risk
Opportunistic Behavior
Many scholars posit that when a party believes that a partner engages in opportunistic behavior, such perceptions will lead to decreased trust and increase the competitiveness between each other [12, 13, and 14]. Ross & Robinson（2007）mentioned that compound relationships can act as a safeguard against opportunism in at least two ways

[1]: (1) through the imposition or threat of sanctions from one component simple relationship to another and (2) by reliance on trust and reputation built in one or more of the component simple relationships.

H3-1: Opportunistic behavior is positively effect the selection of compound relationships and negatively effect selection of portfolio relationships.

Conflict
Conflict is refer to Firat et al.（1975） [15] & Etgar （1979） [16] marketing channel members to comprehended keeping other channel members from reach goals. Conflict represents the overall level of disagreement in the working partnership [11]. Conflict is between partners' goals, resource share and degree of incompatibility of activities [17].
H3-2: Conflict is negatively effect the selection of compound relationships and positively effect selection of portfolio relationships.

Uncertainty
Uncertainty is referring to transaction cost theory [11] and somewhat contrary to the transaction efficiency approach, resource dependence theory [19]. Ross & Robinson（2007）have raised issues related to how the relationship works both socially and economically [1]. We now turn to the political economy framework [20, 21, and 22] and explicitly delineates the internal sociopolitical and economic structures and processes of an institution and the external environment that influences them.
H3-3: Uncertainty is negatively effect the selection of compound relationships and positively effect selection of portfolio relationships.

Intelligence Property
About this topic we interview with some corporate, senior South Asia Business Unit Commissioner, Kenda Rubber, Information Division Section chief, Formosa Plastics Gao Sheng Commissioner. After interview with those corporate, we can sort out that many mature products and technologies had their own patents. Each vendor conduct the business strategy to protect the development of its products and intellectual property, that means patents become one of business strategy. Therefore, at this time, before moving on to the products and technology developers, can significantly reduce its research and development costs, but the risk will stop improvement. For those who follow the products and technologies, wishes to reduce the risk and lower the cost of research and

development for product innovation, we provide the hypothesis 4 as following.
H4: Intelligence property is negatively effect selection of compound relationships and positively effect selection of portfolio relationships

End customer orders allocation
Mentzer et al. (2001) that the Organization for customer orders allocation will be part of the four individuals linked quality, to receive orders to ship the number of quality information and ordering process, the four organizations will become part of the control orders Possession of the main factors [23]. The aim of the customer-oriented and establish a good communication mechanism to avoided the bullwhip effect, we provide the hypothesis 5 as following.
H5: End customer orders allocation is positively effect selection of compound relationships and negatively effect selection of portfolio relationships

The cost of one-stop
In economics and cost accounting, cost of one-stop describes the total economic cost of production and increase variable costs, which vary according to quantity produced such as raw materials, plus fixed costs, which are independent of quantity produced such as expenses for assets like buildings.
H6: The cost of one-stop is positively effect selection of compound relationships and negatively effect selection of portfolio relationships

Research Method
We started a point of view as the firms' production managers of top 2000 manufacturing firms in Taiwan. The scope of research includes all the activities like forwarder got the freight from the owners' cargo, to order the shipping space from marine transportation companies, and to deliver the freight to the destination or receiver.

Contents Validity
All measures of the survey instrument were developed from the literature. The expressions of the items were adjusted. Where appropriate to the context of marine transportation logistics. The items were to be measured on a seven-point Likert scale, ranging from 'Strongly disagree' (1) to 'Strongly agree' (5).

Pre-test and pilot-test
A pre-test was performed with four managers from different enterprises and four Ph.D. students on a questionnaire consisting of 18 items of the survey instrument for improvement in its content and

appearance. Then several large marine transportation firms were contacted to help with the pilot-test of the instrument. The respondents were asked to complete the questionnaire and provide comments on the wording, understandability and clarity of the items, as well as on the overall appearance and content of the instrument. The responses suggested only minor cosmetic changes and no statements were removed. After minor changes being made and further review by two other expert academics, the instrument was deemed ready to be sent to a large sample in order to gather data for testing our research model

Data collection
Two rounds of survey were conducted by distributing the survey instrument in the form of questionnaire to the production managers of top 634 IT industries in Taiwan. These firms were listed in the directories of the top 5000 companies in Chinese Credit 2007 (Taiwan's leading credit company). Therefore, the result of this survey was 64 effective responses with the total response rate of 10.09%. There was no discrepancy from the industry distribution of firms used in this survey when facilitating a chi-square to analyze the industry distribution of respondents. This suggested no non-response bias in the returned questionnaires.

Result

Assessment of the discriminate analysis
Cause that this study just confers two groups as compound or portfolio relationship oriented. Means we have just one differentiation function for our study. Per the synchronous estimation, we can have 12 forecast variables and result as table 2 and show the verification on table 3.

Table 2 Wilks' Lambda

Item	Std	Inter-group Std	F Value
History	0.7953	0.0810	0.88* （0.0001）
Economic importance	0.6093	0.0240	0.13 （0.7181）
Strategic value	0.6013	0.1184	3.32* （0.0001）
Bidirectional Relationships	0.7399	0.0652	0.65 （0.4197）
Long-term Relationships	0.6659	0.0369	0.26 （0.6114）
Relative Powers	0.7793	0.0109	0.9

			（0.021）
Conflict	0.9643	0.0497	0.22 （0.1373）
Opportunistic Behaviors	0.7943	0.1315	2.33* （0.0001）
Uncertainty	0.6184	0.0472	0.49 （0.4849）
Intelligence property	0.6950	0.1034	1.88* （0.0001）
End customer order placement	0.637	0.004907	1.73 （0.338）
Total cost	0.6870	0.0467	0.39 （0.5340）

Table 3 Verification

IT Industry			
Selected \ Actual	Portfolio Relationship	Compound Relationship	Total
Portfolio Relationship	19	8	27
Compound Relationship	7	21	28
Total	26	29	55
Correct rate：72.73%			
Type I error：29.63%			
Type II Error：25.00%			
$C = \left(\frac{27}{55}\right)^2 + \left(\frac{28}{55}\right)^2 = 0.499*1.25 = 50.02\%$			

Reliability Analysis
Analysis of letters degree (Reliability Analysis) is a test tool for measuring volume of letters degree and stability of the main methods. Due to Davis, et al. study found that reliability differences between the samples and used methods of measuring reliability [24]. As the result show in table 4.

Table 4 Reliability analysis

Item	Error variance	Cronbach's alpha
History	0.59137	0.685
Economic importance	0.61223	0.675
Strategic value	0.72837	0.661
Bidirectional Relationships	0.82008	0.668
Long-term Relationships	0.62514	0.682
Relative Powers	0.79564	0.670
Conflict	0.63640	0.681
Opportunistic Behaviors	0.93900	0.646

Uncertainty	0.56761	0.667
Intelligence property	0.71562	0.664
End customer order placement	0.70780	0.656
Total cost	0.66592	0.667
Cronbach's alpha = 0.678		

Conclusion

In order to study the complex relations, our research defines the complex relations to be "Compound or Portfolio Relationships" and explores 12 hypothesis paths, and 12 main factors to analyze this research model. After analysis, we found that in global trade liberalization and internationalization of the industry trends, business environment and faced with the rapid changes in the test, as well as competitive pressures, businesses and other organizations need to have a link relationship, how to manage these types of relationships based on mutual assistance and mutual benefit The way the relationship between the two sides strike a balance in order to bring a competitive advantage for enterprises. In the supply chain in the process of interaction between organizations, manufacturers and third-party co-operation to carry out a stable relationship, the relationship between risk and so are considering links with each other in a significant factor. Therefore, to consider these organizations will affect the decision-making or production strategy, at this stage has become one of the very important subjects. In this study, logistic regression analysis of various factors, supply chain organizations to choose between composite or co-oriented relationship.

Under the rapid change business environment, the relationships of inter-organization in supply chain will be transformed from single to complex relationships, and complex relationships could be categorized into "Compound Relationships" or "Portfolio Relationships". Our research has 12 hypothesizes include 4 hypothesizes had been supported. Per empirical result could know that the 4 hypothesizes show as below.

Hypothesis 2-2: Long-term relationships are positively effect the selection of compound relationships and negatively effect selection of portfolio relationships.

Hypothesis 3-2: Conflict is negatively effect the selection of compound relationships and positively effect selection of portfolio relationships.

Hypothesis 4: Intelligence property is negatively effect selection of compound relationships and positively effect selection of portfolio relationships

Hypothesis 5: End customer orders allocation is positively effect selection of compound relationships and negatively effect selection of portfolio relationships.

Suggestion

Following are suggestions we provided for future research:

Because compound relationship and portfolio relationships have nature of difference, additional benefits also got different distribution the additional benefited at least includes knowledge storage, knowledge sharing, information sharing, information proliferation, techno ledge creative…etc. Therefore, discussion about the different additional benefits with different types of relationships is really valuable research.

Because the overall relationships within inter-organization in supply chain would be effected by the major single existing relationship Therefore, discuss how the exited relationship affect the selection in supply chain and compare the different relationships oriented is valuable.

The research design of the study goes by a cross section way, collect the data on the fix time to build up this relationships oriented theoretical framework model. That means this relationships oriented theoretical framework model could just explain the specific time but could not implement to normal situation. We suggest the further researches using vertical section research design or multiple time data collect to get the sample to build up the dynamic model to discuss how different time phase affect the dynamic selection model.

The data be used in this research is stated data which were collected by questionnaires. If using the panel data to evaluate the theoretical model would increase the reliability for the theoretical mode.

References

[1] Ross, W. T. Jr. & Roberson, D. C.（2007）"Compound relationships between firms," Journal of Marketing, vol.71（July）, 108-123.

[2] Zolkiewski, J., & Turnbull, P. Relationship portfolios – Past, present and future. In D. Ford (Ed.), Understanding business marketing and purchasing (pp. 289−304). London: Thompson. 2003

[3] Fiocca, Renato, Account Portfolio Analysis for Strategy Development, Industrial Marketing Management, Vol.11, pp.53-62. 1982

[4] Campbell, N. C. G. and M. T. Cunningham, Customer Analysis for Strategy Development in Industrial Markets, Strategic Management Journal, Vol.4, pp.369-380. 1983

[5] Krapfel, R., D. Salmond and R. Spekman, A Strategic Approach to Managing Buyer-Seller

Relationships, European Journal of Marketing, v. 25 no. 9, 22-37. 1991

[6] Olsen, R.F., Ellram, L.M., A Portfolio Approach to Supplier Relationships. Industrial Marketing Management 26(2), 101-113. 1997

[7] Ritter, *Thomas* (*2000*): A Framework for Analyzing *Interconnectedness* of Relationships. Industrial Marketing Management, Vol. 29 (4), pp. 317-326.

[8] Arthur, W. B. Competing Technologies, Increasing Returns, and Lock-In by Historical Event, The Economic Journal, vol.99（394）, 116-131, 1989

[9] Anderson, J. C. & Narus, J. A., A Model of Distributor Firm and Manufacturer Firm Working Partnerships, Journal of Marketing, vol.54（1）, 42-58. 1990

[10] Gundlach, T. Gregory and Patrick E. Murphy, Ethical and Legal Foundations of Relational Marketing Exchanges, Journal of Marketing, 57, pp.35-46. 1993

[11] Heide, J. B., Inter-organizational Governance in Marketing Channel, Journal of Marketing, Vol.58, January, pp.71-85. 1994

[12] Williamson, E. O. Market and Hierarchies: Analysis and Antitrust Implications, The Free Press. 1975

[13] Dwyer, R. F. & Schuur, P. H. & Oh S. Developing Buyer-Seller Relationships, Journal of Marketing, vol.51（Apr） 11-27. 1987

[14] Morgan, R. M. & Hunt, S. D. The Commitment-Trust Theory of Relationship Marketing, Journal of Marketing, vol.58（Jul）, 20-38. 1994

[15] Morgan, R. M. & Hunt, S. D. The Commitment-Trust Theory of Relationship Marketing, Journal of Marketing, vol.58（Jul）,

20-38. 1994

[16] Etgar, M. Sources and Types of Intra-channel Conflict, Journal of retailing, vol.55（Spr）, 61-78. 1979

[17] Lee, J. & Y. Kim. Effect of Partnership Quality on IS Outsourcing Success: Conceptual framework and Empirical Validation, Journal of Management Information Systems, vol.15（4）, 29-61. 1999

[18] Williamson, O. E., The Economic Institutions of Capitalism, New York: The Free Press. 1985

[19] Pfeffer, Jeffery and Gerald Salancik, The External Control of Organizations: A Resource Dependence Perspective, New York, Harper and Row. 1978

[20] Benson, J. Kenneth, The Interorganizational Network as a Political Economy, Administrative Science Quarterly, 20 (2), 22-249. 1975

[21] Stern, Louis W. and Torger Reve, Distribution Channels as Political Economies: A Framework for Comparative Analysis, Journal of Marketing, 44(3), 52-64. 1980

[22] Wamsley, Gary L. and Mayer N. Zald, The Political Economy of Public Organizations, Public Administration Review, 33 (January - February), 62-73. 1973

[23] Mentzer, John T., Managing the Supply Chain: Managerial and Research Implications, Supply Chain Management, edited by John T. Mentzer, Thousand Oaks, CA: Sage Publications, 437-461. 2001

[24] Davis, M. J., et al., Axenic culture of the bacteria associated with phony disease of peach and plum leaf scald. Curr. Microbiol. 6: 309-314. 1981