



An exploration of the patterns underlying related and unrelated collaborative ventures using neural network: Empirical investigation of collaborative venture formation data spanning 1985–2001

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Abstract

Collaborative ventures—both equity-based partnerships as well as project-based alliances—have dominated the international business scene over the past two decades. By means of this study we investigate the *patterns* of related and unrelated collaborative venture formation. Using a large database of over 90,000 collaborative ventures formed during the 1985–2001 period, this study clusters collaborative ventures on the basis of the industry group and home country relatedness of the collaborating partners. Self-organizing map technique within neural network methodology is used to accomplish this objective. The clusters obtained from the self-organizing map form the basis for developing taxonomy of collaborative ventures in which the neurons underlying clusters are classified based on the country of origin and industry affiliations of the collaborating partners and the collaborative venture. The distinguishing characteristics of the clusters and the taxonomy help augment our current understanding of the formation of collaborative ventures.

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1. Introduction

Alliance partnerships have been an area of intense scholarly investigations. Researchers have suggested varying rationale for determining the choice of alliance partners. One group of scholars contends that complementary core competencies are central to alliance formation (e.g. Collis & Montgomery, 1995; Hennart & Reddy, 1997; Peteraf, 1993; Silverman, 1999). The underlying rationale here is the synergy that results from resource and skill complementarities between the partners (Das & Teng, 2000). Others argue that the degree of similarity between the partnering firms is positively related to alliance formation and performance (e.g. Akhavan, Berger, & Humphrey, 1997). The similarity argument is rooted in the notion of “relatedness,” both in terms of industry affiliations and home country relatedness.

Industry and home country frequently are cited as factors that are indicative of relatedness among firms engaged in collaborative ventures (e.g., Palich & Gomez-Mejia, 1999; Silverman, 1999). These variables are commonly examined in terms of the closeness between partners’ industries or home country (e.g., Kogut & Singh, 1988) as well as the closeness between parent firms and their collaborative ventures (Merchant & Schendel, 2000). Most researchers argue that relatedness can be regarded as a distance. For example, cultural distance (Kogut & Singh, 1988) captures the degree to which various countries are related. While the relatedness concept has contributed to our knowledge of alliance formation, it also raises a key question: if a joint venture (JV) is in an industry related to one parent but not the other, should this partnership be classified as a related or an unrelated collaborative venture? Some attempt has been made to address this question. Reuer and Koza (2000), for instance, categorize JVs into four groups: parents and JV in the same industry, parents in the same industry but JV in a different industry, JV in the same industry with one parent, and parents and JV in different industries. It was found that only the last two groups are associated with positive shareholder values. This research points to the importance of approaching the relatedness factor from a multidimensional perspective. Furthermore, this issue is compounded by an increasing evidence of alliance formation between partners from somewhat unrelated industries and different countries (Reuer & Koza, 2000; Steensma & Lyles, 2000).

Consensus has yet to be reached as to which of the competing arguments is a valid explanation for alliance formation. Hence, it is important to explore this issue in a generalized setting. The present research represents an attempt towards such an exploratory examination. Specifically, we explore the underlying clusters in collaborative venture formation and their associated characteristics using JV data from 1985–2001. There are three research objectives for this study:

- Explore the underlying patterns in collaborative venture formation during 1985–2001 by allowing the data to self-organize into distinct clusters.
- Develop taxonomy of collaborative ventures formed during the 1985–2001 period based on industry and country of origin of collaborating partners and the collaborative venture.
- Delineate the distinguishing characteristics of the various classes underlying the taxonomy.

A preliminary examination of the dataset indicated that the required assumptions for applying statistical techniques were not met. Hence, the use of econometric and

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