

Collaboration Strategies in Turbulent Periods: Effects of Perception of Relational Risk on Enterprise Alliances^{*}

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Abstract. A study at the enterprise level is carried on, through a simulation model, to explore different aggregate behaviors emerging from individual collaborative strategies and the effects of innovation diffusion. In particular, turbulent periods are taken into account (e.g. an Economic, Financial or Environmental crisis), during which the individual perception of the enterprises can be distorted both by exogenous factors and by endogenous ones. The crisis makes it evident for the enterprises the urge to revise their business model in order to adapt it to the changes of the external environment and of the competitive scenario. The analysis is carried on by means of agent based simulation, employing a comprehensive tool (E³) internally developed and here described. The results are mostly qualitative ones and show that, in response to crisis, communication complexity is reduced, power and influence become centralized, and concern for efficiency increases, leading to conservation of resources and greater behavioral rigidity in organizations.

Keywords: Crisis, Innovation diffusion, Enterprise collaboration, Formation of alliances.

1 Introduction

Researchers have posited a variety of behaviors that will occur within organizations faced with crisis [29]. The threat-rigidity effect hypothesizes that in response to crisis, communication complexity is reduced, power and influence become centralized, and concern for efficiency increases, leading to conservation of resources and greater behavioral rigidity in organizations [21] has also posited that “centralization is a likely outcome of organizational threats and crises, which provides a rationale for legitimately reasserting claims to centralized control”. Individuals may also underestimate the extent to which their own behavior contributes negatively to an organizational crisis, thus reducing their flexibility of response [17]. The rapid pace of technological development and increased globalization of the marketplace are creating a new competitive environment in which competing only with one's own resources has come to mean abandoning opportunities and resources available from

^{*} Although the present article is the result of a joint research project, the seven total sections are divided among the authors as follows: sections 1 and 2 are jointly written and equally divided among the three authors; sections 4, 5, and 6 are by Marco Remondino; section 3 and 7 are jointly written and equally divided among Marco Pironti and Marco Remondino.

others. As a result, the formation of strategic alliances, defined as voluntary inter-firm co-operative arrangements, has become a noteworthy trend in recent years. In search of the so-called “collaborative advantage,” many firms are finding their performance and survival increasingly dependent on their collective activities with other firms. In this context, the role played by managerial perceptions in alliance structuring is crucial. A fair number of scholars have studied strategic decision-making in alliances, typically aiming at understanding the perceptions and decision contexts that form the basis of the partners' decisions. The essence of this approach lies in the prominent role assigned to decision-makers in the alliance-making process. Alliance decision-makers are no longer assumed as completely rational — rather, they are believed to have limitations in reasoning capacity. The studies about innovation prove that, beside the creation of innovations, it is also crucial to study their diffusion in the system in which the firms work and cooperate, i.e.: the network. At that level, it is important to clarify what an enterprise network is and why the firms start to cooperate inside the network for diffusing an innovation. A collaborative network is a whole of nodes and ties with a different configuration based on of what it has to achieve. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines. The idea of drawing a picture (called a “*sociogram*”) of who is connected to whom for a specific set of people is credited to [31], an early social psychologist who envisioned mapping the entire population of New York City. Cultural anthropologists independently invented the notion of social networks to provide a new way to think about social structure and the concepts of role and position [32], [30], [6], an approach that culminated in rigorous algebraic treatments of kinship systems [43]. At the same time, in mathematics, the nascent field of graph theory began to grow rapidly, providing the underpinnings for the analytical techniques of modern social network analysis. The nodes represent the different organizations that interact inside the network and the links represent the type of collaboration between different organizations. The organizations could be Suppliers, Distributors, Competitors, Customers, Consultants, Professional Associations, Science Partners, Incubators, University, and so on. The kind of partner firms linked over a network looks to be related to the type of innovation occurring: for example incremental innovators rely frequently on their customers as innovation partners, whereas firms that have totally new products for a given market are more likely to collaborate with suppliers and consultants. Advanced innovators and the development of radical innovations tend to require a tighter interaction with universities. This point is supported by [18] in a survey of 4.564 firms in the Lake Constance region (on the border between Austria, Germany and Switzerland). By examining the interactions among firms, customers, suppliers and universities it emerges that firms that do not integrate their internal resources and competences with complementary external resources and knowledge show a lower capability of releasing innovations [17].

Philippen and Riccaboni [34], in their work on “radical innovation and network evolution” focus on the importance of local link formation and the process of distant link formation. Regarding the formation of new linkages Gulati [22] finds that this phenomenon is heavily embedded in an actor’s existing network. This means that new ties are often formed with prior partners or with partners of prior partners, indicating network growth to be a local process. Particularly when considering inter-firm alliances, new link formation is considered “risky business” and actors prefer alliances that are embedded in a dense clique were norms are more likely to be