

# SME E-Cooperation: A Theoretical Team Contract Analysis Under Hidden Information

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## ABSTRACT

*Virtual Cooperation among SME firms can be analyzed from different theoretical perspectives. This paper considers e-cooperation among firms under asymmetric information. Firms cooperate jointly to produce some output or service, and they organize in teams whose firms' characteristics are imperfectly observed. Suppose firms can observe their efforts or actions but they cannot observe the disutility of effort which they can discover after the contract is signed. The objective of this paper is to analyze virtual cooperation contracts under hidden information based on the original papers of Holmstrom (1982) and Rasmussen (1987). Some conditions are derived under which it is possible to implement an optimal sharing rule for a virtual team of SME under a hidden information frame.*

*Keywords: Asymmetric Information, Business Management, Contract Theory, Networks, Teams, Virtual Cooperation*

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## 1. INTRODUCTION

Globalization and the increasing complexity of production processes have altered traditional operations' management, leading to a new challenge for small and medium sized enterprises (SME). Inter-firm cooperation has emerged in response. Cooperation plays an important role in the survival of many small and medium sized businesses (Fuller-Love & Thomas, 2004; Rauch, 2001, Kosacoff & López, 2000; Oughton & Whittam, 1997).

Nowadays, since the evolution of network technologies and the decrease in transaction costs due to new Information and Communica-

tion Technologies (ICT), technology providers have developed innovative solutions for SME as regards communication and the management of business. The *New Economy* offers new opportunities for small businesses in terms of internationalization, access to external markets (Chong, 2008; Alderete, 2007) and achievement of further business goals (Aral et al., 2006). Besides, SME in local networks can accomplish a different way of doing business, where the advantages of the local embeddedness, such as informal exchanges, could be offset by the benefits of electronic marketplaces.

The adoption of common standards, exchange of information and shared use of common facilities are all examples of cooperation in which firms may increase their profits. Traditional theory pays little or no attention to

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the role of information, which evidently lies at the heart of organizations (Holmstrom, 1982).

The intensive application of the new information and communication technologies seeks to enhance the competitiveness of the partners of a specific network. However, SME do not just face advantages but also challenges. Awareness, confidence and competence in e-business play a significant role vis-à-vis e-business platform adoption (Braun, 2003). SME can display different abilities towards adoption of networked technologies; for instance, some firms may lack technology skills. Besides, the virtual enterprise requires flexibility and agility, which can be discovered once working in the team. Some authors (Cragg et al., 2002) express the concept of IT alignment which means ‘fit’, it expresses the idea that the object of design, e.g., an organisation’s structure or its information systems must match its context in order to be effective (Iivari, 1992).

The concept of a “team” is described as a small number of individuals with complementary skills, who are equally committed to a common purpose, goals, and a working approach for which they hold themselves mutually accountable. It is worth mentioning that virtual teams are often formed to overcome geographical or temporal separations (Cascio & Shurygailo, 2003). Virtual teams work across boundaries of time and space by utilizing modern computer-driven technologies. The term “virtual team” is used to cover a wide range of activities and forms of technology-supported working.

Organizations are shedding conventional work team structures in favor of virtual team structures that are increasing in popularity (Lee-Kelley, Crossman, & Cannings, 2004).

Pinsonneault and Caya (2005) review the extant empirical literature on virtual teams and present what we know and what we do not know about them. By stressing the variables affecting virtual teams, they assess the effects of virtual teamwork on group processes and outcomes.

E-collaboration enables collaboration between individuals not constrained by geographical distance or time. The emergence of the virtual team concept provides organizations

with an alternative approach to manage work and individuals that are geographically separated (Gatlin-Watts, Carson, Horton, Maxwell, & Marlty, 2007).

In this paper, we consider a team to be a loose-knit group of firms who are organized so that their productive inputs are combined to offer a common output or service by means of an ICT management. In a team, each member firm contributes to some part of the production. A special case of team is the virtual enterprise, an arrangement of the best core competencies of independent companies which cooperate with each other. They are connected by the new information and telecommunication technologies during a certain period of time. Therefore, it is a main goal of the team to link its members to their core competencies. In other words, a certain level of competitiveness may be a prerequisite for a SME’s survival when dealing with dynamic conditions in the business environment (Ebrahim et al., 2010). Increasing use of virtual teams has highlighted the need for organizations to focus on ways to improve their performance (Chieh Liu & Burn, 2009).

Cases of virtual teams involving SME arise progressively. Neto (2007) analyzes the case of the IMMPAC (Integration and Modernization of Personal Computers and Small Companies to Reach the Competitiveness) project. This study involves a wide mapping of industrial clusters all over Mexico, of favorable areas for developing agglomerations of SME (clusters) and a university in order to create a cooperative net. After the accomplishment of such mapping, which identified activities and favorable areas for forming clusters (Federal District -Automotive and Textile; Jalisco: Food and Furniture Industries), a field research was conducted in those areas. Through a statistical sample, the different characteristics of the companies (percentile increase in productivity, employee turn-over rate, age of equipment, level of use of information systems, lead time, etc.) were compared with the international patterns, identifying items that would deserve more attention to obtain improvements. The IMMPAC project thus created a methodology

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