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PhD Thesis

**Strategic need perspective to strategic alliance formation:
a theoretical construction and empirical validations**

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TABLE OF CONTENTS

Chapter 1	1
INTRODUCTION	1
1.1 Introduction.....	1
1.2 Theoretical background and motivations.....	1
1.3 Purpose of the study and research questions	2
1.4 Methodology	4
1.5 Thesis outline	5
Chapter 2	8
UNDERSTANDING STRATEGIC ALLIANCE FORMATION: THEORETICAL BACKGROUND AND LITERATURE REVIEW.....	8
2.1 Introduction.....	8
2.2 Defining strategic alliances.....	9
2.3 Different types of strategic alliances	11
2.4 Theories underlying strategic alliances.....	13
2.4.1 <i>Positioning perspective</i>	13
2.4.2 <i>Resource Based perspective</i>	14
2.4.3 <i>Relational View</i>	15
2.4.4 <i>Evolutionary perspective</i>	16
2.4.5 <i>Transaction cost Economics</i>	17
2.4.6 <i>Institutional Theory</i>	18
2.5 Conclusion	19
Chapter 3	22
CONCEPTUAL FRAMEWORK.....	22
3.1 Introduction.....	22
3.2 Strategic need perspective to inter-firm relationships	23
3.2.1 <i>Efficiency and effectiveness strategic need</i>	23
3.2.2 <i>Knowledge and learning strategic need</i>	25
3.2.3 <i>Global market access strategic need</i>	26
3.3 Operations Management perspectives to networks	27
3.4 Conceptual framework.....	28
3.5 Conceptual framework: defining hypothesis 1	29
3.5.1 <i>Inter-firm objectives related to efficiency and effectiveness strategic need</i>	29
3.5.2 <i>Inter-firm objectives related to knowledge and learning strategic need</i>	33
3.5.3 <i>Inter-firm objectives related to global market access strategic need</i>	34

3.5.4 Hypothesis 1 formulation.....	36
3.6 Conceptual framework: defining hypothesis 2 set.....	37
3.7 Conclusion	39
Chapter 4	41
EXPLORATIVE INVESTIGATION THROUGH A SECONDARY DATA ANALYSIS	41
4.1 Introduction.....	41
4.2. Secondary data in the Strategic Management field	42
4.3. Characteristics of the sample and dataset definition.....	44
4.4 Empirical Analysis: testing hypothesis 1	46
4.4.1 Appraisal hypothesis 1: results and discussions.....	49
4.5 Empirical Analysis: testing hypothesis 2.....	50
4.5.1 Appraisal hypothesis 2 set: results and discussions	53
4.6 Conclusion	53
Chapter 5	57
STRATEGIC NEED PERSPECTIVE TO INTER-FIRM RELATIONSHIPS: A CONFIRMATIVE ANALYSIS IN THE ITALIAN MACHINE TOOL INDUSTRY.....	57
5.1 Introduction.....	57
5.2 Research context: the Machine Tool industry	58
5.3 Contextualizing the theoretical framework in the Machine Tool industry.....	60
5.3.1 Contextualizing hypothesis 1	60
5.3.2 Contextualizing hypothesis 2 set.....	66
5.4 Characteristics of the sample and data collection.....	68
5.5 Empirical Analysis: testing hypothesis 1	69
5.5.1 Appraisal hypothesis 1: results and discussions.....	71
5.6 Empirical Analysis: testing hypothesis 2 set	74
5.6.1 Appraisal hypothesis 2 set: results and discussions	77
5.7 Discussion.....	79
Chapter 6	80
STRATEGIC NEED PERSPECTIVE TO INTER-FIRM RELATIONSHIPS: A CONFIRMATIVE ANALYSIS IN THE ITALIAN BIOTECHNOLOGY AND PHARMACEUTICAL INDUSTRY	80
6.1 Introduction.....	80
6.2 Research context: the Biotechnology and Pharmaceutical industry.....	81
6.3 Contextualizing the theoretical framework in the Biotechnology and Pharmaceutical industry.....	84

6.3.1 Contextualizing hypothesis 1	84
6.3.2 Contextualizing hypothesis 2 set.....	91
6.4 Characteristics of the sample and data collection.....	92
6.5 Empirical Analysis: testing hypothesis 1	93
6.5.1 Appraisal hypothesis 1: results and discussions.....	95
6.6 Empirical Analysis: testing hypothesis 2 set	97
6.7 Discussion.....	100
Chapter 7	102
DISCUSSIONS AND CONCLUSIONS.....	102
7.1 Introduction.....	102
7.2 Summary and conclusions	102
7.3 Theoretical contribution to strategic alliance literature	104
7.4 Implications from Hypothesis 1 assessment.....	106
7.5 Implications from Hypothesis 2 set assessment	111
7.6 Limitations of the study and further researches.....	113
REFERENCES.....	115
APPENDICES.....	129

TABLES

Table 1 Summary of major literature contributions to strategic alliance definition	21
Table 2 Inter-firm objectives	37
Table 3 Cluster analysis results	48
Table 4 Ordered logit results	52
Table 5 Inter-firm objectives in machine tool industry	66
Table 6 Descriptive statistics of machine tool industry data	69
Table 7 Initial cluster results.....	70
Table 8 Alternative cluster results	71
Table 9 Pearson index of inter-firm objectives a and f.....	72
Table 10 Ordered logit results for initial clustering.....	75
Table 11 Ordered logit results for alternative clustering	75
Table 12 Brant test of parallel regression assumption for initial and alternative clustering	76
Table 13 Generalized ordered logit results for initial clustering	77
Table 14 Generalized ordered logit results for alternative clustering.....	77
Table 15 Inter-firm objectives in bio/pharma industry	91
Table 16 Descriptive statistics of bio/pharma industry data.....	94
Table 17 Cluster results	94
Table 18 Brant test of parallel regression assumption.....	98
Table 19 Generalized ordered logit results	99
Table 20 Contribute of major theories to <i>strategic need</i> perspective	106
Table 21 Cluster results in all datasets of the study.....	110
Table 22 Hypothesis 2 results in all datasets of the study	112

Chapter 1

INTRODUCTION

1.1 Introduction

The popularity and the rate of formation of strategic business alliances increased significantly in recent years (Dyer and Singh, 1998; Hagedoorn, 2002; Dyer et al. 2004). The relevance of this phenomenon is realized by the fact that some of the world's largest companies are involved in these business alliances. Strategic alliances are known to be the reason for success of many leading companies such as British Petroleum, Eli Lilly, General Electric, Federal Express, IBM, Starbucks, General Motors, Cisco Systems, Millennium Pharmaceuticals, to mention a few (Bamford et al., 2003). Moreover, this relevance is also explained by the high diversity of patterns that are observed, that is large-small company alliances, private (profit)-public (non-profit) partnerships, competitor alliances, spider-web alliances and so on.

This chapter gives an overview of the strategic alliance topic in the strategic management field and the structure of the study. Specifically, section two briefly presents existing research and the gap identified in it. This gap is transformed into research objectives presented in section three. Finally, the following two sections introduce the methodology applied and the structure of the study that should give a quick overview of the content.

1.2 Theoretical background and motivations

Reviewing the most influential theoretical and empirical explanations on the process of strategic alliance formation it is notable that basically the researchers have tried to find reasonable explanations for two main issues (Kogut, 1988; Osland and Yaprak, 1993; Vyas et al., 1995). The first concerns the following relevant questions: (1) Why do firms enter into strategic alliances? (2) Whom do they choose as partners? (3) What types of contracts do firms use to formalize the alliance? and (4) How do the alliance and the partners' participation evolve over time? Whereas, the second regards the performance evaluation of the relationship in order to assess the success (failure) of the alliance.

The first issue is surely the one having received more contributions in strategic management literature. Firms enter into strategic alliances for various reasons, and the formation of these alliances is one of main research subjects in the field. Recognize and analyse the objectives of an alliance is essential from different reasons, both theoretical and practical. The motives represent the benefits sought *ex ante* by the firm when entering the alliance.

Frequently, the real objectives of the firms are difficult to observe directly. So, the analysis of these motives may form the basis for evaluating potential inconsistencies between the motives for alliance formation and the actual alliance benefits (Brouthers and al., 1995). Moreover, managers that consider signing cooperative agreements should be very clear on the strategic objectives of an alliance decision; this information should be shared with the potential partner to ensure that alliance is based on a foundation of common goals. This sharing of strategic intents is relevant to improve the alliance process itself and allows the partners to focus on making each firm's goals a reality. Therefore, from a managerial perspective, understanding what motivates one firm to establish strategic alliances is a critical issue because of successful alliances require a perfect alignment between “what can be” and “what is” (Spekman et al., 1996).

1.3 Purpose of the study and research questions

Besides theoretical considerations, managers enter alliances to pursue several *inter-firm objectives* (Whipple and Gentry, 2000; Nielsen, 2003). In particular, extant research suggests that alliances allow at accruing market power (Kogut, 1988; Eisenhardt and Schoonhoven, 1996), sharing risk and investment (Shepherd et al., 2000), building new competence (Hennart, 1991) and skills (Hamel, 1991; Mowery et al., 1996), entering new markets (Buckley, 1992), enhancing innovativeness (Narula and Hagedoorn, 1999), developing new products (Contractor and Lorange, 1988), achieving economies of scale and scope (Alvarez and Barney, 2001), reducing cost and improving flexibility (Van Laarhoven and Sharman, 1994; Elmuti, 2003).

Several authors (Kogut, 1988; Ellram, 1991; Osland and Yaprak, 1993; Vyas et al., 1995) suggest that alliances' inter-firm objectives are related to firms' strategic needs. I identified three principal *strategic needs* that provide a working foundation to

explain why firms establish strategic alliances: *Efficiency/effectiveness need*, *Knowledge and learning need*, and *Global market access need*.

The need of efficiency/effectiveness can be achieved by focusing on sharing risk, reducing costs and time, eliminating duplications and waste, and gaining economies. Forming alliances allows companies to gain access to resources that could make them more efficient. Acquisition and development of new knowledge is the basis for organizational renewal and sustainable competitive advantage and it is critical for the survival of the firm. Alliance formation allows companies to fill knowledge and learning need, in case they do not possess the capabilities to achieve these needs by themselves. Finally, firms use alliances to develop new markets for existing products, enter in new product-market domains and exploit new business segments.

Summing up, this approach states that basically managers enter into alliances to accomplish three strategic needs, efficiency and effectiveness, knowledge creation and development, and globalisation achievement.

This approach to alliance formation is quite similar to the Operations Management (OM) perspective on inter-firm supply networks. Indeed, according to the OM literature, supply networks are seen as a mean to accomplish three strategic needs: to achieve efficiency or responsiveness respectively through Efficient Supply Network (ESN) and Responsive Supply Network (RSN) (Fisher, 1997; Chopra and Meindl, 2007); and to foster globalisation through “Global Value Chains” (GVC) (Gereffi et al., 2005). According to OM scholars, supply networks are characterised by a driving strategic needs that are achieving cost efficiency, responsive operations and globalisation enhancement. Managers pursue these needs through specific operative objectives (production flexibility, lead-time reduction, long term cost reduction, operative costs decrease, new market development and so forth) which concern supply chain drivers (facility, inventories, transportation, information and so forth) and through specific inter firm relations with suppliers and customers.

To achieve such operative objectives, ESN are mainly characterised by transactional supply-customer relationships, while RSN and GVC are characterised by collaborative-relational supply-customer relationships.

Such perspective has never been investigated by the strategic management literature; that is scholars in this field have never investigated whether inter-firm objectives that managers pursue within alliances are correlated each other so that they can be grouped into clusters characterised by a *strategic need*.

Summing up all the motivations just presented, the main purpose of this study is to show that managers enter alliances to basically satisfy a specific strategic need characterized by a bunch of inter-firm objectives and that this bunch of objective is correlated with a particular alliance type. To achieve this, the purpose is further broken down into the following research questions addressed in this study:

- Is it possible to group specific inter-firm objectives in clusters characterised by a unique strategic need that managers want to fulfil through alliances?
- Are these clusters correlated with particular alliance typologies?

By answering to these research questions, the study attempts to make contributions to the relevant literature on inter-firm relationships.

1.4 Methodology

The main aspects of each research are the *theory* and the *empiricism*. The interaction between these two elements is the core process for the production of knowledge. This process is also followed in this study. First, a solid *theory* is created. Without a solid theoretical understanding of how to answer to the research questions the study would lack to solve the problem statement. On the other hand, if the theory is created just on a stand-alone basis, it would lack to support the real world. Here is where the *empiricism* comes into play. It tries to draw on conclusions based on what is observable and actual data. The empiricism side in this thesis is based on the selection of data, as well as tests on predetermined hypotheses.

As regards the selection of the data is used a multiple data source triangulation to gather data. By triangulating data researchers gather data from different sources both primary and secondary; indeed, they conduct surveys, pilot case studies, examine public databases or companies' reports, and so on. The main objective of using multiple sources of data on the same phenomenon is to increase the reliability of the data and the strength of the results. Therefore, I apply a multiple data sources triangulation to seek confirmation from several data and reliability of results.

More specifically, in this study there are two main sources of data: original data and secondary. Original data is known as primary data, which are data collected at source. Secondary data is data which already-exists, such as books, documents and journals. Secondary data can be obtained from various sources (Hussey and Hussey, 1997) and they are one of the cheapest and easiest means of access to companies' information.

This study uses secondary data collected from economic and business journal articles that provide the first dataset for this study. As far as primary data, two surveys are conducted. Survey questionnaire is the most common method to collect primary data and are a most useful method when large numbers of people are to be reached in different geographical regions (Sekaran, 2003). I carry out two surveys: the first survey collects data from Italian Machine Tool industry, whereas the second from Italian Biotechnology and Pharmaceutical industry.

The threat of reliability and validity issues are becoming central questions for scholars in the strategic management literature. There are a lot of researches in the strategy literature that illustrate very assorted approaches to reach reliability and validity. As designed and executed in this study, several scholars have used the multiple data source approach to test their theories. For example, the study of Zahra and Covin (Zahra and Covin, 1993) on corporate entrepreneurship provides reliability and validity information by comparing managerial perceptions of firm technology policy gathered through survey methodologies with data from secondary sources. In other works secondary sources are consulted to assess the reliability of the survey-based measures of new product introductions (Chandler and Lyon, 2001). Such triangulation of measurement greatly enhanced both the validity and reliability of the research. Therefore, in the present study I would like to validate the results obtained with the secondary data analysis by applying the same conceptual approach in two several industrial sector and reach the *ecological validity* of the research (Karlsson, 2009). This means that I able to generalize the result across different setting, in this case different industrial sector.

Finally, as regards the methods that enable to make tests and determine relations they are found in the statistical theory. Specifically, a modified version of the classical *k-means* algorithm, and two econometric models such as *ordered logit* and *generalized ordered logit models* are developed.

1.5 Thesis outline

This study is organized into seven chapters. Chapter 1 gives an overview of the strategic alliance topic in the strategic management field and explains why alliances are important in today's business environment. Moreover, Chapter 1 briefly presents

existing research literature on the topic and defines the research objectives of the study.

Chapter 2 examines the theoretical foundations for the present study describing the most influential theories and how they contribute to understand alliance and alliance formation. It also presents an overview of the vast field of inter-firm arrangements that have been labeled “alliances” and the different modes of cooperation agreements. Finally, Chapter 2 offers a review of the most relevant literature on the strategic alliance formation.

Chapter 3 introduces the conceptual framework of the study. Specifically, the chapter begins with a critical identification of strategic needs that explain why firms establish strategic alliances. It then moves on presenting operations management perspective on strategic alliances that, in contrast to strategic management scholars, has investigated whether inter-firm objectives that managers pursue within strategic alliances might be correlated each other. Finally, it presents the conceptual framework definition.

Chapter 4 describes the research design and methodology employed in this study. It introduces the more practical side of methodology and supports from an empirical point of view the conceptual framework defined in Chapter 3. The chapter introduces the secondary data analysis utilized in the empirical analysis and the methodological tools applied to testify the hypotheses. In order to test hypothesis 1 a modified version of the classical *k-means* algorithm is applied. Whereas, in order to prove hypothesis 2 set an ordered logit econometric model is developed.

Chapter 5, appraising the nature of Italian’s machine tool industry, contextualizes the general conceptual framework to strategic alliance’s formation, exposed in Chapter 3, within the Italian machine building sector and empirically validates this framework by using primary data from this industry. The chapter begins with a brief outlook of the machine tool industry. It moves on contextualizing the conceptual framework in the specific industry context. Then, it presents sample data, empirical analysis and results and finally it discusses the results and considers the validity and reliability of the study and potential limitations.

The main purpose of Chapter 6 is to contextualize the conceptual framework, already validated through a secondary data analysis in Chapter 4 and an empirical survey in

Chapter 5, by using primary data from another Italian industrial manufacturing sector, the biotechnology and pharmaceutical. The chapter begins with a brief outlook on the bio-pharma industry, and it motivates and supports the theoretical approach in this specific industry. Then, it presents sample data, empirical analysis and results and finally discusses the results and considers the validity and reliability of the study and potential limitations.

The final chapter begins with the summary and conclusions of the study. Hence, the main theoretical contributions of this study are presented. Then, it presents the implications that respectively arise from the hypothesis 1 and hypothesis 2 set appraisal. Finally, it outlines the limitation of the study and suggests further research development.

Chapter 2

UNDERSTANDING STRATEGIC ALLIANCE FORMATION: THEORETICAL BACKGROUND AND LITERATURE REVIEW

2.1 Introduction

Strategic alliances have received enormous attention in strategy literature (Barringer and Harrison, 2000; Das and Teng, 2000) and this chapter presents a review of this field. The most relevant academic literature is reviewed to create the conceptual framework for this study.

There are two major theoretical areas in this study. The first area concerns the literature on inter-firm cooperation, which in academic terminology is usually labelled as “alliances” or “strategic alliances”. A strategic alliance is a long-term inter-firm collaborative arrangement between two or more companies in a given economic space for the achievement of mutually well-defined strategic goals (Buckley, 1992). Here different aspects and typologies of alliance are presented.

The second area reviews the most influential theoretical and empirical explanations on strategic alliance formation. There is a considerable body of research in the strategic management field that attests the importance and the evolution of the inter-firm relationships (IFR) (Grandori and Soda, 1995; Håkansson and Snehota, 1995); transaction cost, resource dependency, relational view, organizational learning, strategic positioning, and institutional theory. The analysis does not intend to be a fully review of strategic management literature on the topic, but rather it presents the most influential schools in strategic management which are involved from an alliance perspective. The emphasis is on summarizing the core of these theories and showing how they contribute to understanding alliance and alliance formation.

The reminder of the chapter is organized as follow. The following section presents an overview of the vast field of inter-firm arrangements that have been labeled “alliances”. The third section outlines the different modes of cooperation agreements. Finally, the fourth section offers a review of the most relevant literature on the strategic alliance formation.

2.2 Defining strategic alliances

Co-operation between firms is a very old phenomenon; companies have entered into alliances for centuries. There was a clearly discernible increase in the number of alliances during the past three decades (Draulans et al., 2003).

The first “*alliance literature*” is usually said to date back to the 1960 with Evan and Warren’s works on inter-organizational relationships (Evan, 1966; Warren, 1967). The number of agreements has grown from less than 10 percent of all alliances in 1970 to approximately 85% in the mid 90’s. The rapid growth of the 1980’s and 1990’s resulted in prosperity of literature and in many different views and definitions of what an alliance is. There are many definitions of strategic alliance in literature; some of the most influential are chronologically presented below.

Ariño (Ariño, 2003) defines a strategic alliance as a “formal agreement between two or more business organizations to pursue a set of private and common interests through the sharing of resources in contexts involving uncertainty over outcomes”.

According to Contractor and Ra (Contractor and Ra, 2000) an alliance is “any cooperative or joint action between two companies on contractual and/or equity joint venture basis”.

Das and Teng (Das and Teng, 2000) define strategic alliances as “voluntary cooperative inter-firm agreements aimed at achieving competitive advantage for the partners”.

According to Parvatiyar, Sheth, and Whittington (Parvatiyar et al., 1992) “an alliance is an ongoing, formal, business relationship between two or more independent organizations to achieve common goals”.

Parkhe (Parkhe, 1993) defines strategic alliances as “relatively enduring inter-firm cooperative arrangements, involving flows and linkages that use resources and/or governance structures from autonomous organizations, for the joint accomplishment of individual goals linked to the corporate mission of each sponsoring firm”.

According to Choi and Willcocks (Choi and Willcocks, 1995) strategic alliances are “relationships involving voluntary efforts and significant resources of two or more organisations to create, add to, or maximise, their joint value”.

According to Forrest (Forrest, 1989) “strategic alliances are those collaborations between firms and other organizations, both short-term and long-term, which can involve either partial or contractual ownership, and are developed for strategic reasons”.

As can be seen from the previous definitions, one common view of what an alliance is does not exist. More definitions for example are stricter than others, while others emphasize more the cooperative nature of the cooperation than others and so on. Besides the definitions presented it is possible to recognize several common key points that define a strategic alliances:

- strategic alliance covers only inter-firm agreements, that is an *alliance operates across the boundaries of a firm*;
- agreement must be *collaborative*, that is there must be resource sharing among all the partners;
- agreement is defined over economic time and space, this means that an *alliance can range from local to global*, and can be defined in real time or until certain goals are reached;
- agreement must be *strategic*, that is an alliance must be a significant impact on corporate future position and competitiveness.

Before to go in-depth it is useful to clarify some confusion about the terminology used in literature to refer to strategic alliances.

Researchers who are in favor of a more *inclusive view* maintain that virtually all kinds of inter-firm arrangements should be called strategic alliances (Borys and Jemison, 1989; Lei and Slocum, 1991; Forrest, 1992; Murray and Mahon, 1993; Stafford, 1994). These authors have used the following terms as synonymous: business alliances, strategic alliances, strategic partnerships, strategic networks, interorganizational linkages, inter-firm cooperation, joint ventures, cooperative strategies, coalition strategies, R&D consortia, cross-licensing, cross-distribution, supply purchasing, franchising, co-manufacturing, cross marketing, buying groups, and so on. On the other hand, some researchers have adopted a more *restricted view*, and have sought to make a distinction between strategic alliances and other cooperative arrangements (Devlin and Bleackley, 1988; Yoshino and Rangan, 1995). According these authors strategic alliances are only those deals in which the parent firms are tied to each other in a long-term interdependence, with shared control, and continued contributions by the parents. Following these narrowed view seems that only a few kinds of cooperative arrangements would qualify as strategic alliances, that is joint ventures, equity investment, joint R&D, and joint marketing. For the main purpose of this study I believe that it is not fundamental makes this distinction

between restricted and inclusive view. Therefore, in this study, like others authors in the field, I use the term “strategic alliance” as a common term to encompass all the previous inter-firm relationships (Harrigan, 1986; Ohmae, 1989; Parkhe, 1991).

In addition, in this study I consider among strategic alliances also outsourcing contracts and merger and acquisition agreements. As several authors explain outsourcing concerns such questions to transfer routine and repetitive tasks to an outside source that provides service that usually are performed in-house. This means that outsourcing is about the strategic use of resources outside in order to perform activities that otherwise would have been done by using internal resources. Therefore, according several scholars (Quinn and Hilmer, 1994; Noteboom et al., 1997; Langfield-Smith and Smith, 2003) the outsourcing of core and non-core activities is a form of strategic alliance. Companies are looking at outsourcing strategically, so that they can focus on what really differentiates them from their competitors, not just to save costs (Quinn and Hilmer, 1994). Moreover outsourcing contracts are typically managed through extended contracts requiring mutual commitment and sharing of specialized resources, i.e. a description closely matching the definition of a strategic alliance (Tiwana and Keil, 2007; Mudambi and Tallman, 2010).

Finally, I encompass also Merger and Acquisition (M&A) as a distinct alternative between strategic alliances and other inter-firm relationships (Barney, 2002). M&A is considered a “make” solution because of is a governance form that internalises the assets or the activities to be accomplished during the inter-firm relationship.

2.3 Different types of strategic alliances

As explained in the previous section, existing research shows that alliances can take a variety of forms those represent different approaches that partner firms adopt to control their dependence on the alliance, different legal forms which enable firms to control the resources allocation, and different distribution of benefits among the partners. To explain the conceptual framework of this study I consider the following range of inter-firm organizational modes generally utilized in collaborative agreement activities.

- *Merger and acquisition*: through acquisition or merger, one firm takes full control of another’s assets and coordinates actions by the ownership rights mechanism;

- *Joint Venture*: two or more firms create a jointly owned legal organization that serves a limited purpose for its partners, such as R&D or marketing;
- *Alliance/Partnership*: a coalition of one or more enterprises that combine, coordinate, and manage their collective resources;
- *Franchising*: a franchiser grants a franchisee the use of a brand-name identity within a geographic area, but retains control over pricing, marketing, and standardized service norms;
- *Subcontracting agreements*: inter-linked firms where a subcontractor negotiates its suppliers' long-term prices, production runs, and delivery schedules;
- *Outsourcing agreements*: arm's-length transactions between organizations coordinated only through the price mechanism.

This list does not intend to be an exhaustive description of the wide range of types of strategic alliances, but embrace just the typologies of IFRs include in the several datasets of this research.

As is possible to notice, the principal dimension ordering this classification is that, from bottom to top, collaborating firms experience increasing integration and formalization in the governance of their relationships (Lorange and Roos, 1993). With governance form is referred the combinations of legal and social control mechanisms for coordinating the relationship and safeguarding partners' resource contributions, administrative responsibilities, and division of rewards. At the bottom of the list are spot-market transactions requiring no obligation for recurrent cooperation, coordination, or collaboration among the anonymous exchanging parties. At the top are hierarchical authority relations in whom one firm takes full control, absorbing another's assets and personnel into a wholly owned enterprise. In between these two extremes of market and hierarchy are several governance forms of strategic alliance, also called "hybrids" that combine varying degrees of market interaction and bureaucratic integration (Williamson, 1975).

Thus, strategic alliances are ranked on a continuum between free market transaction and complete internalization solutions (Lorange and Ross, 1993). Even if it is difficult to be specific, concrete and detailed regarding the ordinal ranking of this range, it is safe to state that equity-based agreements represent a higher level of internalization and interorganizational interdependence than non-equity agreements. Therefore, in

this study strategic alliance modes are ranked on a continuum that varies for various degrees of interorganizational interdependency and levels of internalization (Hageddorn, 1990).

2.4 Theories underlying strategic alliances

Several theoretical paradigms have been advanced to explain the motives for forming collaborations, including transaction cost (Williamson, 1985; Hennart, 1991), resource dependency and resource based view (Pfeffer and Nowak, 1976), organizational learning (Hamel, 1991), strategic positioning (Porter and Fuller, 1986), institutional theory (Meyer and Rowan, 1977; Di Maggio and Powell, 1983), stakeholder theory and strategic choice (Barringer and Harrison, 2000).

All these approaches try to explain the creation of strategic alliances suggesting that market uncertainty, efficiency requirement, resource dependency, efficiency management of the risk, imperfect factor market, skill and resource heterogeneity, social legitimacy and so on drive companies to engage in strategic alliances to reach competitive advantages. Among these several theoretical approaches, I choose to review the most used theories to explain the process of strategic alliances formation also taking in consideration the principal objective of this study: Positioning perspective; Resource-based view; Relational view; Evolutionary perspective; Transaction Cost Economies and Institutional theory.

2.4.1 Positioning perspective

The industrial organization (IO) or positioning perspective suggests that company's external environment controls its strategic behaviour. The researchers of industrial organization perspective sustain that the industry in which the firm operates have a great impact on the firm's strategy. Meaning that, competitive advantage is primarily a function of a firm's membership in an industry with favorable structural characteristics. Consequently, many researchers have focused on the industry as the relevant unit of analysis.

Specifically, these researchers assert that industry characteristics such as for example barriers to entry and product differentiation have also a great impact on company performances (Porter, 1980). Another key point is the strategy creation process; the

strategy formation is a process controlled and conscious that produces intentioned strategies and that strategy precedes the structure (Mintzberg et al., 1998).

Considering these premises, the positioning perspective views an alliance mainly as a way to compete with an allied partner against other alliances and to obtain a specific desired position in the market. Therefore, from a positioning perspective alliances can be viewed in the context of competitive rivalry and collusive agreements to enhance market power.

2.4.2 Resource Based perspective

The growing criticism towards the positioning perspective during eighties and nineties led to the development of alternative theories, such as Resource Based View (RBV), that look at strategy inside-out in opposition to Porter's school of outside-in view. According to resource-based perspective firms are seen as bundles of resources (Wernerfelt, 1984; Peteraf, 1993). The term resource covers strengths or assets of the firm that may be both tangible, such as financial assets and technology and intangible, such as reputation and managerial skills.

The core idea of RBV is that a strong strategy should be based on the resources, competences and capabilities of the firms. These resources should then provide a competitive advantage over rivals (Barney, 1991). Since resources are heterogeneously distributed across firms, this perspective recognizes that some important internal resources can be obtained from external sources via interorganizational relationships such as alliances, or by engaging in mergers and acquisitions (Eisenhardt and Schoonhoven, 1996; Chung, et al., 2000). According to RBV scholars IFR decisions are made when other firms are the source of valuable capabilities and IFR provides a firm with access to these capabilities (Lavie, 2006). In this sense alliances are, therefore, cooperative relationships driven by logic of strategic resource needs.

Since the heterogeneity of firm resources, according several authors the RBV theory can be divided in two different views, the traditional resource based theory and dynamic capability approach. This last approach, developed by Prahalad and Hamel (Hamel and Prahalad, 1992) emphasized the development of the resources through strategic learning. This dynamic view of the RBV has many linkages to strategic alliance formation. Indeed, competitive advantage due to the strategic capabilities can

be found exploiting the core competencies of the allied partner. This core competency can be anything from marketing to billing or manufacturing. The main characteristics are that they provide potential access to a wide market, contribute to perceived customer benefits and are difficult to imitate for competitors (Hamel and Prahalad, 1992).

2.4.3 Relational View

Relational view scholars, in turn, explain that competitiveness arises not from firm, but from the relationship itself between firms (Dyer and Singh, 1998; Lavie, 2006). The starting point of the relational view is a criticism of both established approaches of strategic management, industrial organisation and RBV. Both theories ignore the fact that the sources of competitive advantage are often deeply embedded within a network of inter-firm relations (Dyer and Singh 1998; McEvily and Zaheer 1999; Ahuja 2000; Gulati et al., 2000; Dyer and Nobeoka, 2000; Croom, 2001). Specifically, the researchers argued that firm's critical resources may span firm boundaries and may be embedded in inter-firm routines and processes. They claim that combining resources in unique way allows firms to realize an advantage over competing firms who are unable to do so. Thus, idiosyncratic inter-firm linkages may be a source of relational rents and competitive advantage.

Unlike the positioning scholars that focused on the industry as relevant unit of analysis and resource-based perspective scholars that focused on resources and capabilities, the relational view researchers considered a pair or inter-firm relationships as important unit of analysis. Thus, the inter-firm relationships in which firms are situated may provide the basis for strategic advantage (Gulati et al., 2000). Indeed, the intuition that alliances generate relational rents and are source of value creation is supported by several studies which suggest that, on average, alliances do create economic value (Anand and Khanna, 2000).

According this perspective, alliances generate competitive advantages since they move the relationship away from the attributes of a pure market relationship. Indeed, in a typical pure market transaction nothing is idiosyncratic about the exchange relationship meaning that the two parties are not able to generate profits above and beyond what other comparable transactions can generate. In these arm's-length market transactions the relationships are not rare or difficult to imitate. Thus allied partners

can generate competitive advantages only if they move the relationship away from the attributes of market relationships. This means that should be done more investments in relation-specific assets and should be exchange among parties substantial knowledge, including the exchange of knowledge that results in joint learning. Moreover, the complementary and scarce resources and/or capabilities should be pooled together for the joint creation of unique new products, services, or technologies. In this way companies can generate supernormal profit, also called relational rent, through a relationship that cannot be generated by either firm standing alone and can only be created through the joint idiosyncratic contributions of the specific alliance partners. Summarizing, according the relational perspective there are four potential sources of inter-firm competitive advantage or relational rents which arise, in contrast to the RBV, exclusively due to cooperative relations between companies: relation-specific assets; knowledge-sharing routines; complementary resources and capabilities; and effective governance mechanisms.

2.4.4 Evolutionary perspective

While positioning school concerned with the optimal position of a company within its marketplace, RBV searches for the optimal use of strategic resources, and relational perspective looks at non-imitable relationships that generate superior competitive advantages, the scholars of evolutionary theory sustain a different approach. Considering an evolutionary approach to strategy means developing dynamic models that explain strategy formation considering the changes that occur in companies over time (Burgerlman, 1991; Barnett and Burgerlman, 1996). Thus, this school advocates an evolutionary perspective to studying organization adaptation. They note the importance of studying organizations over a long period of time with an historical perspective emphasizing the co-evolution of the firm and its environment.

This approach might be associated with dynamic capability approach of resource-based perspective since they both deal with the changes that occur in companies over time. However, while the leaning perspective of dynamic capability approach is more related to learning process within organizations, the evolutionary perspective looks at the market or external forces in which the learning or evolutionary happens (Burgerlman, 1991). According the most influential scholars of this perspective (Aldrich, 1979; Nelson and Winter, 1982), the actual behaviors of companies are less

a result of strategic choice and control and more a result of changing external conditions. Moreover, they recognize patterns, also called routines, which can explain the evolution of organization over time.

From an alliance perspective the evolutionary theory considers strategic alliances in the context of the adaptation choices of the firm and is an opportunity to understand how alliances evolve over time. Indeed, one of the most important criticisms of the previous theories is that they don't recognize the evolutionary elements excessively focusing on the initial conditions of the alliances. Studying the evolution of the alliances over time is important since they co-evolve with the changing strategies of firm, the industry strategic practices, and the changing regulatory and institutional environment (Larsson et al., 1992; Ariño and De la Torre, 1998).

Summarizing, according to evolutionary perspective the decision to enter into an alliance as well as the type and form should be a function of specific considerations, such as the portfolio of each partner, the regulatory environment, the institutional arrangements and the accepted industry practices.

2.4.5 Transaction cost Economics

Most academic approaches to understanding firm strategy have been grounded in the theory of the firm literature. The classic to which many researchers continuously refer is the transaction cost theory of the firm, or Transaction Cost Economics (TCE). Surely TCE is one of the theoretical approaches most applied for understanding strategic alliance formation (Pisano and Teece 1989; Shan 1990; Hennart 1991; Williamson 1991).

The focus of TCE is on how an organization should organize its boundary by spanning activities so as to minimize the sum of its production and transaction costs. Developed by Williamson in 1975, TCE suggests that firm chooses alternative arrangements that minimize this sum of costs (Williamson, 1975). According this theory market-based and hierarchical organizations are alternative instruments to accomplish a transaction, and whether a transaction should be executed across markets or within a firm depends on the relative efficiency of each mode, that is depends on the transaction cost associated (Williamson, 1985). In market exchanges, transaction costs include factors such as search, selection, negotiation, fulfillment and

enforcement. Within firm boundaries, costs generally include agency and control costs.

From an alliance perspective this theory emphasizes transaction cost efficiency as the motivation underlying such inter-firm cooperation; strategic alliances are intermediate hybrid forms between the extremes of markets and hierarchy (Gulati, 1995). The TCE argument suggests that strategic alliances are more efficient than market or hierarchical solutions when they minimize the firm's transaction costs (Jarillo, 1988). Through an alliance firm can change its boundary to minimize the sum of its transaction and production costs. The main argument of this theory is that in order an alliance is the most economic solution firm must be able to control coordination costs, incurred in decomposing tasks among partners and coordinating actions through integrated decision relationships (Gulati, 1998; Gulati and Singh, 1998).

Summarizing, according to TCE scholars (Williamson, 1979), the motivations for entering into alliance include solving market failure problems caused by asset specificity and reducing transaction costs (Hennart, 1991). Alliances contribute to reduce the opportunistic behaviour of partners (Pisano et al., 1988), arising when transactional conditions lead the firm to desire some degree of control over the transaction without fully internalizing it. Moreover, TCE arguments suggest that alliances are more efficient in certain instances than pure market or hierarchy solutions because they minimize the firm's transaction costs (Barringer and Harrison, 2000).

2.4.6 Institutional Theory

Institutional theory (DiMaggio and Powell, 1983) suggests that institutional environments impose pressures on organizations to appear legitimate and conform to prevailing social norms. Since firms are embedded in social frameworks of norms, values, and rules of exchange in the strategic choices should be considered also the institutional forces existing in each transition economies (Fligstein 1996; Hoskisson et al., 2000).

In a business context, institutional pressures motivate firms to pursue activities that will increase their legitimacy by appearing to be in agreement with the prevailing social rules and norms of their business environments (Zucker, 1977; Scott and Meyer, 1983; Oliver, 1990).

From an alliance point of view, to legitimate themselves companies participate in interorganizational relationships. It is usually for example that a small firm increases its reputation, image, and prestige through partnerships with larger and better-established companies. In this context, legitimacy should be seen also as an opportunity to open the doors to other relationships that help a small firm gain access to critical resources or expertise. Moreover, besides being motivated to obtain legitimacy to enhance firm's reputation, companies are also motivated to simply conform to social norms as a means of survival (Oliver, 1991). One strategy for acceptance and survival is to simply acquiesce to the environment. This strategy often involves forming strategic alliances to imitate or mimic allied partners.

Summarizing, researchers who rely on institutional theory argue that alliances are formed for the conformity to social justification, social obligation (Di Maggio and Powell, 1983). Moreover, strategic alliances are often developed to enhance a firm's own status and image by tapping into the reputation of more established partners (Hitt et al., 2001) or to enhance firm legitimacy (Dacin et al., 2007).

2.5 Conclusion

The early review of the most central strategy literature on IFRs shows how the increasing importance of strategic alliances has resulted in growing interest in theorizing about their causes and consequences. Economists, organization theorists, sociologists, strategic management, marketing, operations management, and international business scholars conduct alliance research. And, the diversity of the phenomenon challenged scholars' ability to develop all-encompassing theory.

The different areas in strategic management studies, reviewed in this chapter and summarized in Table 1, have all made valuable contributions to the strategic alliance topic. The perspectives summarized in Table 1 contribute to a more thorough understanding of the links between strategy and alliances. These theories are later in this study drawn together into an integrated conceptual framework. Through the conceptual framework I prove that needs, motives and creation of alliances cannot be explained by just one view of strategy. Since, depending on which "lens" is used, or which strategic needs is fulfilled, an alliance can have several motives.

Following the anticipations of Chapter 1, my intuition is that since strategic needs are composed from a mixed portfolio of inter-firm objectives theoretically deduced from

several theories on its own none of the previous theoretical rationales are holistic. So, even if each theoretical construction is useful to explain the alliances formation, it is also insufficient to explain the coexistence of different objectives in one strategic need. For these reason, I blend together various theoretical streams trying to provide a more useful means in understanding the formation of strategic alliances.

Perspective	Theory Focus	Strategic alliance dimension	Key literature
<i>Positioning school</i>	Firm performance is predicted by industry properties. Company's external environment controls companies' strategic behaviour.	Strategic alliances are a mean to compete with an allied partner against other alliances and to obtain a specific desired position in the market.	Porter (1980); Porter and Fuller (1986); Mintzberg et al. (1998).
<i>Resource Based view</i>	Competitive advantage depends on possessing bundle of unique, rare, durable, and inimitable resources.	Strategic alliances allow to possess or to acquire resources that are lacking; resource pooling is the principal aim.	Wernerfelt (1984); Peteraf (1993); Barney (1991); Eisenhardt and Schoonhoven (1996).
<i>Relational view</i>	Competitiveness arises from the network of inter-firm relationships in which one firm is embedded. Idiosyncratic inter-firm linkages may be a source of relational rents and competitive advantage.	Strategic alliances generate competitive advantages since they move the relationship away from the attributes of market transaction in which relationships are not rare or difficult to imitate.	Dyer and Singh (1998); Gulati, et al. (2000); Lavie (2006).
<i>Evolutionary perspective</i>	Dynamic models explain the strategy formation considering changes that occur in companies over time. Focus on how companies behave and how the environment affects these behaviors.	Strategic alliances evolve over time and all the phases of an alliance are important, not just the initial conditions. Learning through cooperation.	Hannan and Freeman (1977); Aldrich (1979); Nelson and Winter (1982).
<i>Transaction cost economics</i>	Existence of the firm; boundary of the firm. Minimizing transaction cost choosing the most efficient mode between market and hierarchy.	Strategic alliance might be the most efficient governance form to manage the transaction.	Williamson (1975, 1985); Jarillo (1988); Pisano and Teece (1989); Gulati (1995).
<i>Institutional theory</i>	Institutional environments impose pressures on organizations to appear legitimate and conform to prevailing social norms.	To legitimate themselves (increases reputation, image, prestige and so on) companies participate in strategic alliances.	DiMaggio and Powell (1983); Oliver (1990, 1991); Hitt et al. (2001).

Table 1 Summary of major literature contributions to strategic alliance definition

Chapter 3

CONCEPTUAL FRAMEWORK

3.1 Introduction

Firms establish alliances for many reasons (Gulati, 1998). Strategic alliances are effective strategies to overcome skills and resource gaps encountered in gaining access to global markets (Collins and Doorley, 1991; Lei and Slocum, 1991), and are considered tools for capitalizing on core competencies (Webster, 1992; Hamel, 1994). Moreover, they allow for greater financial investments in product research and development than one firm stand-alone would be willing to risk (Burgers et al., 1993; Hagerdoorn and Schakenraad, 1993). Strategic alliances occur as a mechanism for limiting environmental uncertainty by the parties of the alliance (Burgers et al., 1993), and can be used to share technological enhancing to increase the possibility that product innovations become industry standards. Furthermore, companies frequently seek partner with who share the risk, research and development costs of launching new products, with a goal of reducing environmental uncertainty (Burgers et al., 1993).

As is possible to notice from the previous sentences, the literature on motivation for alliance formation is rich, fragmented and produces an impressive list of reasons for why organizations enter into an alliance. The review of several theoretical explanations and conceptual models, suggests that managers pursue different inter-firm objectives in alliances and that the formation of alliances depends on firms' strategic needs and organization's attributes.

Basically, I identify three principal *strategic needs* that provide a working foundation to explain why firms establish strategic alliances: *Efficiency/effectiveness need*, *Knowledge and learning need*, and *Global market access need*. The aim of this chapter is to contribute to the relevant literature by trying to prove that is possible to group alliances' inter-firm objectives into three main clusters with outlined strategic needs and that these clusters are related with particular alliance typologies. To accomplish this aim I develop a general conceptual framework that will be testified in the next following chapters.

This chapter begins with a critical identification of strategic needs that explain why firms establish strategic alliances. It then moves on presenting operations management perspective on strategic alliances that, in contrast to strategic management scholars, has investigated whether inter-firm objectives that managers pursue within strategic alliances might be correlated each other. Finally, the last two sections present the conceptual framework definition.

3.2 Strategic need perspective to inter-firm relationships

The common argument in most of reviewed literature is that increased international competition between companies forces them to pursue strategic inter-firm relationships. Through these strategic agreements companies seek new market entry and foreign assets, exploit external sources of new knowledge and shared financial risks of new project development.

Several theoretical explanations and conceptual models (Kogut, 1988; Ellarm, 1991; Osland and Yaprak, 1993; Vyas et al., 1995) suggest that, managers have different motives for forming alliances and that are dependent upon firms' strategic needs and organization attributes. Basically, alliances are motivated by the desire to achieve some benefits of a global strategy or the need to compensate for the absence of, or weakness in, a (perceived) needed asset or competency.

I identified three principal *strategic needs* that provide a working foundation to explain why firms establish strategic alliances: *Efficiency/effectiveness need*; *Knowledge and learning need*; *Global market access need*. They are considered strategic because they have a significant impact on corporate effectiveness that means its future position and competitiveness. This conceptual model states that managers decide to form alliances when they realize that one of more of three strategic needs efficiency/effectiveness achievement, knowledge creation and development, and globalisation accomplishment have to be fulfilled.

3.2.1 Efficiency and effectiveness strategic need

In literature, the cost-efficiency motivation is applied when one company enters in a strategic alliance basically to lower the cost of some of its activities by sharing the costs with one or more other companies. This cost-efficiency rationale plays an

important role in industry that are typically capital-intensive, manual-intensive and R&D-intensive (Hagedoorn, 1993).

Strategic alliances have been prescribed as an important tool for achieving and maintaining a competitive advantage through a cost-economizing approach. In Contractor and Lorange (Contractor and Lorange, 1988) is presented a cost-benefit analysis of the choice between cooperative agreements and fully owned solutions of an international business choice. In this case the motivation for entering an alliance is cost savings from the alliance. Particularly, it has been argued that the increasing cost of innovation might be an important motivation for firms to enter into alliances (Porter and Fuller, 1986; Hagedoorn, 1993; Glaister and Buckley, 1996). Moreover, strategic alliances allow at obtaining significant cost savings by externalizing activity to a company that can do it better and cheaper. Indeed, many companies are forming alliances looking for the best quality or technology or the cheapest labor or production costs (Quinn, 1994).

A significant example that explains efficiency/effectiveness need perspective to IFR formation is the multiple strategic alliance between Boeing, Aerospatiale of France, British Aerospace, Construcciones Aeronauticas of Spain, and Deutsche Aerospace of Germany. These airplane builders decided to create an alliance to spread out the awfully high costs of developing a new jet airplane (Das and Teng, 1999; Wheelen and Hungar, 2000). The main motivation of this multiple development-based alliances is to spread the cost of developing of a new product development satisfying strategic need of efficiency. Another example is found in the automotive industry, in the small car segment competition. Toyota Aygo, Peugeot 107 and Citroen C1 are all the same car produced on shared production lines, and re-badged. The competitor manufacturers collaborate to share development costs, technology investment, and to achieve economies of scale (Ichijo and Kohlbache, 2008). But still compete on packaging, price, service and brand.

In summary, the need of efficiency/effectiveness can be achieved by focusing on sharing financial risk, reducing costs and time, eliminating duplications and waste, and gaining economies. Forming alliances allows companies to gain access to resources that make them more efficient.

3.2.2 Knowledge and learning strategic need

It is generally accepted that customers, suppliers, and horizontal alliance partners (Von Hippel, 1988; Hamel et al., 1989; Hagedoorn, 1993; Helleloid and Simonin, 1994; Osland and Yaprak, 1995; Florin, 1997; Larsson et al., 1998) can be an important source of knowledge. Especially in high technologically dynamic industries, such as biotechnology, participation in knowledge sharing and learning networks might be vital to maintain competitiveness (Liebeskind et al., 1996; Powell et al., 1996; Powell, 1998).

There is a consistent body of works that suggests how IFRs are motivated by access to mutually complementary assets and learning (Badaracco, 1991; Lei and Slocum, 1992; Mowery et al., 1996; Powell et al., 1996). Firms enter into strategic alliances to learn the new technology from their partners and, in turn, enhance their own competencies. This is especially true in the modern global markets characterized by an intensive competition, in which companies must identify their skill and competency gaps to fill them rapidly. And more often they find that the fastest way to fill them is with the capabilities of strategic partners.

In strategy literature several scholars have explained the formation of alliances as an instrument used by firms to acquire know-how, to learn and internalize new skills that reside within other organizations and that are tacit, collective, and embedded. These new skills and core competencies are not for sale on an open market thus it is hard to internalize them by other means. Indeed, Parise and Henderson (Parise and Henderson, 1991) claim “the types of knowledge resources exchanged in alliances can range from intangible, tacit resources such as employee expertise or company brand name, to tangible, physical resources such as equipment, components, or products”. In his famous work of 1988 Kogut (Kogut, 1988) argues that alliances are formed because they might help transfer of tacit knowledge that is not easily transferred in a typical market based relationships. Tacit knowledge might be easier transferred within alliances that foster intense interaction and collaboration between partners (Kogut and Zander, 1992).

A significant example of strategic alliance formed to satisfy knowledge and learning need is the partnership between Toyota and General Motors (Hamel, 1991). While GM focused on copying specific operational routines, Toyota saw it as a window on their partner’s understanding of the European market. While GM avoided short term-

investment, Toyota gained knowledge that allowed them to move into the European and American markets and reach larger long-term benefits. Hence, this is a typical knowledge-sharing partnerships signed to internalize the idiosyncratic resources of the competitor and learn through its production routines and rules.

Summarizing, both acquisition and development of new knowledge and organizational learning are the basis for organizational renewal, sustainable competitive advantage and therefore they are critical issues for the survival of the firm. Alliance formation allows companies to fill knowledge and learning need, in case they do not possess the capabilities to achieve those results stand-alone.

3.2.3 Global market access strategic need

Global competition has become a central issue for both small and large companies. The emergence of Asiatic multinational firms has created a new competitive environment that requires the globalization of corporate strategy. For these reasons among the top purposes for forming strategic alliances entering new markets is the most quoted (Coopers and Lybrand, 1997).

Companies do not have the time, resources, capacities to establish new markets one-by one. In today's rapid world economy, this is especially true; companies cannot play without partners both local and global. Therefore, forming strategic IFRs with an existing company that already operates in that marketplace is an attractive alternative. Allaying with a foreign global company should make the expansion into unfamiliar and unknown markets easier and less stressful for a company. Basically, three are the principal trends that suggest how allaying is the right choice from a global perspective. First, firms understand that their markets and capital sources are global. Companies seek competitive positions abroad that are equivalent to their positions at home and in this research speed is crucial in capturing these new markets. Selecting foreign partners is one means to achieve this, especially when the partner provides the resources required to overcome the typical barriers of new markets. Second, standardization and common markets also open up markets that had previously been difficult to penetrate since national monopolies and regulations. Finally, the third trend is the increasing strength and growing presence of Asiatic companies in the global markets. These companies have quick accesses to new technologies with decreased risk, and at relatively low cost.

A noteworthy example of strategic alliance formed to satisfy a new market need is the licensing agreement in the beer sector of Anheuser-Busch the producers of the famous brand Budweiser. Anheuser-Busch preferred to license the rights to produce and sell the Budweiser beer to other beer producers such as Labatt in Canada, Modelo in Mexico, and Kirin in Japan, rather than buying a foreign company or build their own facilities to produce beer in other countries (Wheelen and Hunger, 2000). Licensing agreement with international beer producers allows Anheuser-Busch to expand its Budweiser brand into new and unfamiliar regions by broadening its markets.

Concluding, the portrait of the competitive landscape revealed by this analysis provides reasonable understanding to examine the strategic alliance formations. Consequently, under these conditions, firms use alliance formation to engaged in cross-border economic activities, maximizing the presence of the company in not just those locations, which are their primary markets, but also in those locations in which their competitors already operate realizing a globalization aim.

3.3 Operations Management perspectives to networks

This approach to alliances formation is quite similar to the Operations Management (OM) perspective on inter-firm supply networks (Fisher, 1997; Sturgeon, 2002; Chopra and Meindl, 2007). Indeed, according to Chopra and Meindl a supply network should be designed to be either responsive or cost efficient. The main drivers for enabling responsiveness or cost efficiency performance of supply chains are facilities, inventory, transportation, information, sourcing and pricing and, of course, relationships with suppliers and customers.

Also Fisher (Fisher, 1997) embraces such perspective by affirming that a supply network strategy should be focused on obtaining a Responsive Supply Network (RSN) or an Efficient Supply Network (ESN). The main purpose of a RSN is to respond quickly to unpredictable demand and supply, so that RSN relies on small-scale flexible facilities, shortening production lead times through production and supply batch size reduction, shortening time to market through simultaneous engineering or early supply involvement (Wynstra, et al., 2001; McIvor and Humphreys, 2004), frequent supply provision, agile logistic structure, information sharing and so forth (Skinner, 1974). In order to achieve this bunch of operative objectives, an RSN are characterised by collaborative-relational supply-customer relationships. On the other

side, an ESN aims at providing goods at a lower unit cost, but often losing agility. So that ESN relies on large-scale facilities in order to achieve long term cost advantage, lower operative costs through product standardisation and production offshoring, longer production lead times, larger batch sizes and so forth (De Groote, 1994; Fisher, 1997). To achieve such operative objectives, ESN are mainly characterised by transactional supply-customer relationships.

Finally, another kind of supply network that have been recently located in OM studies, stresses the concept of globalisation of the operations and has been named “Global Value Chains” (Harland et al., 1999; Sturgeon, 2002; Gereffi et al., 2005). Global value chains aims at developing new geographical markets, bringing the products close to the customers, while keeping the manufacturing efficient through overseas off-shoring or outsourcing. In order to achieve these objectives, global value chain relies on supply-customer agreements that, depending on the specific objective, can be more or less transactional.

According to OM scholars, supply networks are characterised by a driving strategic objectives, namely to achieve cost efficiency, responsive operations or globalisation enhancement, that managers pursue through the networking strategy; such strategic objective can be achieved through specific operative objectives (production flexibility, lead-time reduction, long term cost reduction, operative costs decrease, new market development and so forth) which concern supply chain drivers (facility, inventories, transportation, information and so forth) and through specific inter firm relations (relational collaborative or more transactional) with suppliers and customers.

3.4 Conceptual framework

The OM perspective to networks suggests an approach to IFRs that has never been investigated by the strategic management literature. Indeed, strategic management scholars have never investigated whether inter-firm objectives, which managers pursue within alliances, are in some way related each other with a particular strategic need. This would implies that is possible to group inter-firm objectives into homogeneous clusters which are characterised by the achievement of a particular *strategic need*.

Furthermore, if is possible to group inter-firm objectives into clusters each one characterised by a strategic needs, is also possible to hypothesize that the strategic

need characterising the cluster is correlated with a particular alliance typology, so that the each strategic need is pursued by a particular typology of alliances.

The above motivations have inspired the research questions discussed in this study and already presented in Chapter 1: (a) Is it possible to group specific inter-firm objectives in homogeneous clusters characterised by a unique strategic need that managers want to fulfil through alliances? (b) Are these clusters correlated with particular alliance types? By answering to these research questions, I aim at contributing to the relevant literature on IFRs.

In the next section I explain and formulate the theoretical base of such new approach; I critically review the relevant literature concerning specific inter-firm objectives in alliances and I design a conceptual framework hypothesising that basically three principal *strategic needs* provide a sounding explanations to understand why firms establish strategic alliances (hypothesis 1). Furthermore, by reviewing the relevant literature concerning alliances typologies I try to hypothesize a link between a bunch of specific inter firm objectives characterised by a specific strategic need and a particular typology of alliance (outsourcing, alliances, joint-venture and so on) (hypothesis 2 set).

3.5 Conceptual framework: defining hypothesis 1

3.5.1 Inter-firm objectives related to efficiency and effectiveness strategic need

In strategic literature several scholars have highlighted how strategic alliances can enhance efficiency and effectiveness of a firm focusing on a set of specific inter-firm objectives mainly concerning cost, time, quality and financial risk reduction (Gulati, 1998). This is also demonstrated in a survey conducted by Elmuti (Elmuti, 2003) of a sample of 1500 organizations throughout the United States. When the focuses are fostering business efficiency, rationalizing through a more efficient allocation of resources and in lower unit production costs, promoting cost savings through contained or lower prices at all levels in the supply chain, IFRs' agreement became vitals.

Specifically, strategic alliances can enable partners to lower costs by taking advantage of *long-term economies* such as scale, scope, and/or experience effects (Contractor and Lorange, 1988; Varadarajan and Cunningham, 1995; Alvarez and Barney, 2001). It was demonstrated that when the production is characterized by learning by doing

and economies to achieve these benefits firms try to reduce costs by expanding their production. Long-term economies can be achieved when two or more firms pool their resources together, maximizing efficiency based on the project's needs. Inter-firm agreements also allow small companies to join together to compete against an industry giant. Moreover, also companies of different sizes may benefit from joining together; the large company offers its capital and resources in exchange for the efficiencies or innovations found at the smaller company. Several are the examples of companies that through joint venture or strategic outsourcing delivered significant cost savings and production efficiency by allowing the exploitation of economies of scale not achievable by the parties independently in smaller manufacturing plants (Hagedoorn, 1993).

Moreover, through strategic alliances companies enhance international competitiveness, rationalize efficiencies, and reduce operating costs in mature markets by increasing concentration and integrating production. Thus, strategic alliances have also been undertaken to reduce *operative cost*. This has been surely observed in supplier-customer relationships, where strategic alliances allow reducing costs related to inventory, order processing and information sharing (Handfield, 1993; Van Laarhoven and Sharman, 1994; York Y. Woo et al., 2001). According to several scholars, outsourcing relationships are highly specific for reducing operative costs by externalising activities to high-specialised companies (Frayer et al., 2000; Elmuti, 2003).

Also *labour cost reduction* has been observed as an inter-firm objective in alliances (Sia and Bruton, 2005) and outsourcing contracts (Elmuti and Yunus, 2000); indeed, through manufacturing strategic alliances the production can be transferred to the lower cost locations which have the greatest comparative advantages thanks to lower sourcing costs (Contractor and Lorange, 1988). Several are the cases in which companies outsource manufacturing processes to firms from countries where labour is cheap or particular expertises exist, for example in the Asia-Pacific region. For example, General Electric contracted out the production of microwave ovens to Samsung of South Korea or Compaq uses Japanese suppliers to produce LCD screens and power management systems (Schniederjans et al., 2005). Nike's manufacturing chain is based on a high level of subcontracting agreements distributed among Malaysia, Thailand and China where they find low wage, semi-skilled labour resources (Kumar and Malegeant, 2006).

As far as time related objectives are concerned, strategic alliances are developed both to reduce lead times and time to market. *Lead-time reduction* is particularly observed in supply chain oriented alliances whose objective is to achieve time responsiveness (Perry and Rumpf, 1999; Hoyt and Huq, 2000; Bhatnagar and Viswanathan, 2000; Hertz, 2001). Furthermore, the outsourcing of electronics manufacturing through contract manufacturing produces low-cost, high-quality products with short lead times (Lonsdale and Cox, 2000). Particularly, the result of outsourcing in HP's case has been the reduction of lead times from many months to a matter of days, and, consequently, the protection of its competitive position (Duysters et al., 1999; Lonsdale and Cox, 2000).

Time to market reduction was observed as one of the primary motivations for alliances, together with access partner's resources and cost reduction by Yasuda et al. (Yasuda, 2005). Faster a firm develops new products and brings them to market, more likely it is to capture first-mover advantages. This occurrence is more evident in high-tech and pharmaceutical industry (De Man and Duysters, 2005), where the relative effectiveness of patent protection leads to patent races in which the winner takes all existing scenarios (Gilbert and Newbery, 1982; Tirole, 1988). Strategic alliances have the potential to expedite development times, since resources will be on hand when needed, especially at short notice (Piachaud, 2002; Power et al., 2004). This development time reduction has been observed in several case studies such as in the outsourcing deal between Rolls Royce Aerospace Group's and EDS (DiRomualdo and Gurbaxani, 1998).

Quality improvements provide additional advantages to accomplish the strategic need of efficiency and effectiveness since through alliances firms are able to reduce scrap and defect rates. *Quality* objectives, *product* and *process*, are achieved especially in supply chain strategic alliances where quality improvements can be obtained through partnerships with critical suppliers (Saraph et al., 1989; Flynn et al., 1994; Ahire et al., 1996). Supplier quality improvement is viewed as two-dimensional (Carter and Ellram, 1994): there may be improvement owing to the modification of product designs (product quality improvement) or to implementation of process analysis techniques (process quality improvement). Quality improvements provide efficient/effectiveness advantages as through the alliance both firms are able to reduce scrap and defect rates (Leenders and Blenkhorn, 1988; Larson, 1992; Pilling and Zhang, 1992; Magrath and Hardy, 1994). Strategic alliances have been often linked to

quality improvement (Lau and Hurley 1997; Kotabe et al., 1998). For instance, IT investments and production outsourcing are associated with lower plant cost and higher product quality improvement (Bardhan et al., 2006) and if a firm is experiencing internal process quality problems, it may turn to outsourcing to improve the process quality (Graf and Mudambi, 2005).

Motives for strategic allying may be moreover related to the reduction of *financial risk* of the firm taking part in complex projects. Excellent examples of strategic alliances realized to share and reduce risks associated to new developments have been observed in alliances between biotechnology and pharmaceutical companies (McCutchen and Swamidass, 2004). The R&D costs associated to the development of new drugs are usually really huge and several are the critical risks. There is no guarantee that at the end a new drug can be found and commercialized and even if such drug is successfully developed there is no guarantee that the company is the first one in the industry to arrive at the result. All these reasons make sense to involve other companies in the project through a collaborative agreement to share the previous risks. In addition outsourcing agreements have been indicated as risk reduction strategies (Shepherd et al., 2000); indeed, by outsourcing non-critical functions, a company can leverage its financial resources, share its financial risk, and allow management to concentrate on core competence.

Standardization of product/process has become a domain of firm strategizing and it provides additional advantages to realize the need of efficiency/effectiveness. Indeed, once a winning standard is established, the manufacturers market uncertainties, and consequently the production costs, are reduced (Keil, 2002). Firms that are able to control this standard obtain higher returns while the other firms might be effectively locked out of the market. There are several studies in strategy literature that analyse how firms create standards through alliances (Axelrod et al., 1995; Wade, 1995) and several are the initiatives such as Bluetooth, SyncML, or Symbian, in which a small number of firms try to develop a joint standard through joint R&D agreement or R&D strategic alliance. The largest strength of standardization through alliances lies in enabling rapid standardization while decreasing the uncertainty that is caused by a large number of competing technologies (Keil, 2002).

3.5.2 *Inter-firm objectives related to knowledge and learning strategic need*

The acquisition of knowledge and the development of organizational learning are also primary reasons why firms establish alliances. A considerable number of scholars describe the use of alliances to acquire new capabilities, new knowledge and skills from alliance partner's capabilities, as being able to provide a superior competitive advantage (Kogut, 1988; Cohen and Levinthal, 1990; Hamel, 1991; Mowery et al. 1996; Inkpen and Beamish 1997; Inkpen 1998). They also found that the cooperative learning helps firms to overcome limitations in their own resource by extending at the same time the application of their core competencies to achieve competitive advantages (Hagedoorn, 1995; Mitchell and Singh, 1996; Lei et al., 1996; Zahra et al., 1999). The need of knowledge and learning can be fulfilled through strategic alliances by pursuing the following set of inter-firm objectives (Inkpen, 1998): sharing complementary resources from different partners, developing new capabilities and skills, developing innovative products and new process technologies.

As several researchers have demonstrated one of the most cited reason underlying strategic alliances formation is to seek out knowledge by *acquiring new knowledge and skills* from the allied partner (Hamel, 1991; Powell and Brantley, 1992; Mody, 1993). Knowledge creation obtained by sharing resources such as technologies, know-how, organisational practices have been observed in several manufacturing contexts (Inkpen, 2000) and, recently, in the biopharmaceutical field (Zhang et al., 2007). In the automotive industry, it was demonstrated that the acquisition of knowledge was the main objective in the joint venture between GM and Toyota, since GM hoped to learn the efficient production system of Toyota in the small car segment and transfer it in its plants (Contractor and Lorange, 1988; Glaister and Buckley, 1996). Moreover, strategic alliances, combining some of the incentive structures of markets with the monitoring capabilities and administrative controls associated with hierarchy, have advantages over conventional market-based contracts in gaining the access to tacit knowledge (Inkpen, 1998).

By definition, according to the RBV perspective, strategic alliances involve *sharing and pooling of complementary resources*. From the literature of resource-based view is known that the firm is a collection of heterogeneous, valuable, rare and difficult to imitate resources, semi-permanently tied to the organization that are a potential source of competitive advantage (Wernerfelt, 1984; Das and Teng, 2000; Gulati et al., 2000).

The same literature sustains also the premise that few organizations are self-sufficient with respect to critical and strategic resources (Pfeffer and Salancik, 1978). Because of companies are characterized by an idiosyncratic bunch of resources in order to remain competitive they need to make pooling of additional complementary resources with other companies. By forming alliances with partners who offer these resources reduces the uncertainty and manages the dependence (Brouthers et al., 1995; Vyas et al., 1995; Tsang, 1998).

Moreover, in a market place characterized by rapid changes, firms must be able to adapt quickly by innovating their products, processes or services. The problem is that organizational inertia and constraints due to administrative culture make it difficult for firms to internally develop the capabilities required to deal with these changing conditions (Bartlett and Ghoshal, 1989; Hannah and Freeman, 1989). For these reasons, it has been illustrated how alliances may be used to bring together different issues, which foster the *innovation process* (Contractor and Lorange, 1988; Kogut, 1988). The alliance partner allows firms to improve the new product development process as well as shorten critical lead-times to bring new products to market faster. Therefore, when the main objectives are significant and quick innovations, these are likely to result from the fusing of complementary alliance partners, rather than to be achieved by one firm acting alone. Moreover, the knowledge exchange required for innovative product and process development renewal requires close collaboration between companies that improves the transfer of knowledge between people (Narula and Hagedoorn, 1999).

3.5.3 Inter-firm objectives related to global market access strategic need

Motives for forming strategic alliances extend beyond pure financial and knowledge/learning objectives, to encompass also the creation of new market opportunities (Varadarajan and Cunningham, 1995; Johansson, 1995; Rackham et al., 1996; Hitt et al., 2001). Historically, firms have tried to enter in new and foreign markets and businesses to research growth and profitability using different entry strategies, such as strategic alliances (Contractor and Lorange 1988; Buckley, 1992). Strategic alliances whose primary purpose is to fulfil the need to globalize the market are focused on a set of specific inter-firm objectives mainly concerning new market penetration, developing of new business segments and increasing market share.

The alliance with foreign firms that are familiar with the local environment, legal and political regulations, regulatory barriers to entry, as well as local distribution channels, advertising agencies and that have in-depth knowledge of local markets may contribute to enhancing the penetration and/or development of *new market* (Varadarajan and Cunningham, 1995). At an international level, combining activities of two geographically separated companies for particular markets supports internationalization and globalization of companies that lack of competences and experiences to follow such a strategic move independently. Therefore many firms seek to exploit the opportunities of new markets by building links with local partners in order to gain global market access (Buckley, 1992). A significant example of this is the joint venture among Siemens Energy and Shanghai Electric that was an important for Siemens to enforce its market penetration in the huge Chinese energy market (Siemens Press, 2010). Otherwise, a classical example of big international company that would penetrate in a foreign market using the joint venture formula with a local partner is the joint venture agreement signed in 2010 by Peugeot automaker with Chinese partner Chang'an Automobile (Reed, 2010).

Another way to become more global is to broaden the product line by *developing new business segments*. In markets that are visibly decreasing, there are few strategies that companies can use to survive in the long run; the diversification into new segments outside the sector already covered is a likely option. In literature, IFRs are mentioned for their ability to create new markets and products, to provide market-entry and to expand the product range of both partners. As illustrated by different alliances in the automotive industry, such as U.S. manufacturing company GM's alliances with Japanese competitor Isuzu and Suzuki or Chrysler and Mitsubishi, firms enter into strategic alliances in order to extend existing business segments and, consequently, foster globalization (Contractor and Lorange, 1988). Moreover, in 2009 the two industry giants Bosch and Samsung created a joint venture named SB LiMotive to develop lithium-ion batteries and enter in an explored business segment (Bosch Media Service, 2008). Then, strategic alliances also allow firms to diversify into attractive, but unfamiliar, business areas, providing a less risky mean of entering new markets.

Finally, firm can improve its global presence, strengthen its competitive success, and secure its positions consolidating its *market share* (Buckley, 1992; Eisenhardt and Schoonhoven, 1996; Barringer and Harrison, 2000; Das and Teng, 2000). To increase market share a company can either take customers from its competitors or attract new

customers. Among all the benefits already discuss partnerships, joint ventures and strategic alliances in general can offer a significant option to broaden existing customer base. Thus, creating alliances allow at expanding the customer base by selling more to existing customers, selling into new markets, and focusing marketing efforts on retaining customers. Is shown in literature how always more often companies create joint ventures and partnerships with the purpose of building a bigger and more targeted customer base (Kogut, 1991; Contractor and Lorange, 2002). Indeed, if a potential partner has a customer base that can be a potential market for the company products, creating strategic alliances allows sharing and combining this base.

3.5.4 Hypothesis 1 formulation

From the above discussion I locate 16 inter-firm objectives listed in Table 2. The literature analysis suggests how inter-firm objectives from A to I are mainly related with *efficiency/effectiveness needs*, i.e. such inter-firm objectives are a mean to pursue efficiency/effectiveness. On the other hand, objectives from J to M are mainly related to *knowledge/learning needs*, i.e. such inter-firm objectives are a mean to acquire new knowledge and learning. Finally, objectives from N to P are mainly concerned to *global market access needs*, i.e. such inter-firm objectives are a mean to globalize markets and production.

Code	Inter-firm objectives
A	Long term economies
B	Reducing operative cost
C	Reducing labour cost
D	Reducing lead time
E	Reducing time to market
F	Improving product quality
G	Improving process quality
H	Reducing financial risk
I	Standardization of product and process
J	Acquiring and developing new knowledge
K	Sharing and pooling complementary resources
L	Developing innovative product
M	Developing innovative production process
N	Entering and developing new markets
O	Entering and/or developing new business segments
P	Improving market share

Table 2 Inter-firm objectives

According to strategic need perspective to IFRs, managers basically intend to fulfill three strategic needs when they make IFRs' decisions: efficiency/effectiveness, knowledge and learning and global market access. This implies that inter-firm objectives that contribute to obtain the same strategic need are pursued in strong correlation each other, that is manager pursues them in cluster when they make inter-firm agreements. These clusters are named according to the three strategic needs which are for sake of conciseness: *Efficiency* referring to efficiency and effectiveness, *Knowledge* referring to knowledge and learning, and *Globalization* referring to global market access. Clusters are characterised by a strong internal correlation among the objectives and weak external correlation among objectives of different clusters. According to these reasonings the following hypothesis can be stated:

Hypothesis 1: *Inter-firm objectives can be grouped in the following clusters: (a) Efficiency cluster consisting of objectives from A to I; (b) Knowledge cluster consisting of objectives from J to M; (c) Globalisation cluster consisting of objectives from N to P.*

3.6 Conceptual framework: defining hypothesis 2 set

Having hypothesized that specific inter-firm objectives can be grouped into clusters each one characterised by a strategic need who is pursued by forming strategic alliances, in this section I would like to hypothesize that these strategic needs are

achieved through a particular typology of alliance such as outsourcing, off-shoring, alliance, partnership, and joint venture and the strategic needs previously identified.

As already predicted in Chapter 2, strategic alliances can be ranked on a continuum between contractual market agreements, i.e. the *market*, and complete internalization, i.e. the *hierarchy* as indicated in TCE language (Lorange and Roos, 1993; Narula and Hagedoorn, 1999). Between these two extremes a range of inter-firm organizational modes can be located depending on the degree of interorganizational interdependency and the level of internalization.

As it is well known, outsourcing is a “buy” decision, that is the externalizing some activities previously done inside; therefore, according to the main stream of literature on hybrids (Williamson, 1991; Menard, 1996), outsourcing is the closest governance form to the *market*.

Outsourcing and/or supplier-customer (vertical) agreements play an important role on fulfilling efficiency and/or effectiveness needs; indeed, in such case, companies “buy” efficiency/effectiveness from a partner who is able to provide it. Therefore, according to Organizational Economics studies (Williamson, 1991), when transaction relies more on external partner abilities, unless opportunism risk related to asset rents is not high, relationships should be more market oriented in order to keep production cost low and to rely on the efficiency of the market mechanism. Under this perspective, alliances whose main objective is to achieve efficiency/effectiveness are more related with governance forms close to the *market* such as outsourcing.

On the other hand, joint venture is a governance form that foresees the creation of a new company that internalises some assets or activities of the parent companies; therefore, it is the closest governance form to the *hierarchy*.

In IFRs that are more focused on resource sharing and pooling, companies share tangible and intangible assets in order to develop new technologies, new knowledge, new products, and so forth. In such case two issues are important: according to the RBV scholars (Barney, 1991; Gulati et al., 2000), the strategic impact of the resources pooled is important to develop sustainable advantage for the partners; furthermore, according to the Relational approach (Dyer and Singh, 1998; Lavie, 2006), the most important issue for obtaining a competitive advantage is to build a successful relationship with the partner. In this case, Organizational Economics studies suggest that when pooling important and strategic assets in a close relationship, the opportunism risk becomes high and rent-sharing problems must be solved; therefore,

governance forms need to be closer to a *hierarchy*. Thus, under this perspective, alliances whose main objective is satisfying the knowledge and learning need are more related with governance forms close to the *hierarchy* such as JV and alliance/partnership.

Finally, an alliance/partnership solution is generally a contractual arrangement among separate entities; therefore, in a continuum between *market* and *hierarchy*, it lays in the middle between outsourcing and JV.

According to Relational view scholars (Dyer and Singh, 1998) if the main objective is developing and penetrating new markets, the partner should be selected on the basis of relational characteristics such as trust, reputation, and willingness of sharing information and risk. Thus, in order to become global, a company can either develop strong and close joint ventures or alliances with local partners to distribute their products and services, or produce products and services in the local market in order to stay closer to final customers and better develop the local market itself. From the above considerations the following hypotheses can be stated:

Hypothesis 2a: *When the main strategic need is to gain efficiency/effectiveness, IFR governance forms are market oriented and therefore closer, in decreasing order, to outsourcing and non-equity alliances.*

Hypothesis 2b: *When the main strategic need is either to gain knowledge/learning or to globalize, IFR governance forms are more hierarchy oriented and therefore closer, in decreasing order, to joint ventures and alliances/partnerships.*

3.7 Conclusion

The aim of this chapter is twofold. First, it aims at showing that managers enter alliances to basically satisfy three strategic needs: *efficiency/effectiveness need*, *knowledge and learning need* and *global market access need*, each one characterized by a bunch of inter-firm objectives. As stated in the first hypothesis of conceptual framework companies enter into strategic alliances with complex and multiple inter-firm objectives. From the review of strategic literature and considering what declared by managers when sign an agreement, the notion that firm enters alliances just to satisfy one inter-firm objectives is not supported by this study. Instead, in the conceptual framework just developed I assume that, for example, reducing operative

costs is one of inter-firm objectives that is always achieved in strong correlation with others belonging to the Efficiency cluster. Or, acquiring new knowledge is another inter-firm objective that is always reached in strong correlation with others belonging to the Knowledge cluster. The same consideration occurs for all inter-firm objectives described in this chapter.

The second aim of this chapter is to understand if the three clusters are correlated with particular alliance types. In other words, following the considerations of the several theoretical approaches reviewed in this chapter, I assume that, when an IFR is established to fulfill efficiency/effectiveness strategic need, the contractual form used to formalize the agreement is more market oriented, such as outsourcing and alliance agreements. Whereas, when an inter-firm agreement is established to fulfill knowledge and learning or global market entry strategic needs the contractual form used to formalize the agreement is more hierarchy oriented, such as M&A, JV and non-equity alliance.

In the next chapter, I conduct an explorative study for testing the hypotheses of conceptual framework by using secondary data sources. I would like to prove through an empirical test that the previous three clusters exist, and that they are composed from a mixed portfolio of inter-firm objectives theoretically deducted from several theories. Moreover, I would like to verify, through the empirical investigation about the hypothesis set H2, that governance structure choices in the process of strategic alliance formation are affected by the strategic need perspective.

Chapter 4

EXPLORATIVE INVESTIGATION THROUGH A SECONDARY DATA ANALYSIS

4.1 Introduction

This chapter presents the key methodological considerations of this study. The principal aim here is to introduce the more practical side of methodology and support, from an empirical point of view, the conceptual framework defined in Chapter 3.

In order to test the framework, secondary data collected from economic and business articles are used. In here, a new methodology to reduce subjectiveness embedded in such data typology is developed and applied. The dataset definition for empirically test could put some lights on the use of such kind of secondary data sources in strategic management research.

The methodological criteria used to prove first and second hypothesis is explained in details in the chapter. Specifically, in order to prove hypothesis 1, a modified version of the classical *k-means* algorithm is developed. While, in order to test hypothesis 2 set, since the dependent variable is an ordinal one, an *ordered logit* model is applied.

It is quite important to consider that the same methodology presented here will be utilized in the next two chapters, when I validate the conceptual framework in two different industrial sectors: the Italian Machine Tool and the Italian Biotechnology and Pharmaceutical industries. Indeed, in order to develop a complete understanding of the research issues I decide to employ a multiple data source triangulation. Through triangulating I expect various data sources to lead to a singular proposition about the phenomenon studied.

The first two sections introduce the data utilize in the empirical analysis. In order to test hypothesis 1, the fourth section presents a modified version of the classical *k-means* algorithm. Whereas, in order to prove hypothesis 2 set, the fifth section presents an econometric model, the ordered logit regression. Finally, the last section discusses the results and considers the validity and reliability of the study and potential limitations.

4.2. Secondary data in the Strategic Management field

Secondary data analysis is commonly known in literature as “*second-hand analysis*” (Roth, 2007; Roth et al., 2008). It consists of analyzing data collected by someone else, not specifically for the research questions at hand, and using these data to get a better understanding of a theoretical concept (Stewart, 1984; Frankfort-Nachmias and Nachmias, 1992).

The growing use of information and communication technologies to collect data has created numerous opportunities for research that employs secondary data. The availability of data collected by others as corporations, government agencies, news agencies, industry groups, and other parties is growing very rapidly. Moreover there are different sources where it is possible to find secondary data; they range from the private, e.g. organizational archives, to the highly public such as official statistics and newspaper articles; from material collected by individuals to data gathered by governments or organizations. Finally, in terms of their nature, they may be qualitative or quantitative (including financial), and recent or historical (Bryman, 1989).

A simple classification, that is not a comprehensive list of all secondary data sources available but, rather than a classification to illustrate their wide variety and the rich potential, is the following: paper-based sources, for example books, journals, periodicals, research reports, market reports, annual reports, newspapers and magazines; and electronic sources, as CD-ROMs, on-line databases, Internet, videos and broadcasts. All these sources have in common that some other parties, generally without research purpose, has collected them.

The major advantage of working with secondary data is the cost and time saving, since someone else has already collected the data and the researcher does not have to dedicate resources to this phase of research; another advantage of using secondary data set is that data are frequently cleaned and stored in electronic format so that the researcher can spend more time analysing the data. On the other hand, there are some drawbacks in using such a research approach; the most important issue concerns the reliability, the accuracy and the integrity of the available data. This is because usually is unknown who collected the data and what kind of trust and reliability can be done to the data collection phase. For such reason, the use of secondary data sourcing for

scientific research is usually suggested in the early stage of the research, the exploratory one, and during the phase of theory building, as in this part of the study.

The choice of primary or secondary data is not necessary an either/or question. Using both typologies of data is quite frequent in research works, and many authors strongly believe that using a multiple empirical approach, namely a methodological triangulation, is required in order to develop a complete understanding of the research issues (Singhal et al., 2008). Indeed, the principal aim of the triangulation is to improve the research quality by offering convergence and completeness in the researchers' knowledge of a complex phenomenon (Boyer and Swink, 2008). As already introduced in Chapter 1, in this study I use a triangulation of data sources to improve the validity of research and the evaluation of findings. Data triangulation refers simply to using several data sources; in this study three different sources are used, secondary data source, and two empirical surveys. The main assumption is that the bias inherent in any particular data source or investigator is cancelled out when used in conjunction with other data sources and investigators (Cowton, 1998; Harris, 2001). Thus, I use multiple data source triangulation basically for two purposes: to increase confidence in findings by identifying confirming or contradictory evidences and to make findings that could not be made using a single data source.

There is a significant body of empirical studies about inter-firm relationships, published in strategic journals that utilize secondary data set such as alliance databases (Schilling, 2008); the more important are Security Data Company (SDC), MERIT-CATI, CORE, Bioscan and Recombinant Capital (RECAP). Each database has strengths and limitations, which make it more suited to some type of research than others. From a comparative analysis of these databases, I noticed that, for the objective of this research, none satisfied my scopes. Indeed, none of these databases analyze inter-firm relationships from a managerial point of view, that is considering which are the strategic objectives that managers wish to pursuing through a given inter-firm relationship.

For example, SDC is a multi-sector database that collects a very wide range, between 1990 and 2005, of agreement typologies, such as joint venture, strategic alliances, research and development agreements, and supply and manufacturing agreements. SDC offers data including the name, the SIC code, the nationality of the participants, and the terms of the deal. But it is not possible to find any information regarding the inter-firm objectives the company wishes to achieve through the specific inter-firm

relation; the same holds for the MERIT-CATI database. Indeed, MERIT-CATI is a multi-sector database that focuses on technologic agreements involving transfer of technology or joint research and development and collects data from newspaper, journal articles, books, and company annual reports. The results of this brief analysis on existing alliance databases explain why, for the purpose of this study, is needed to build an *ad hoc* database collecting specific data from secondary sources able to answer to the research questions.

4.3. Characteristics of the sample and dataset definition

In order to empirically test the conceptual framework and to address the research questions I apply an approach very similar to that used by Yasuda (Yasuda, 2005). I build an *ad hoc* dataset collecting specific data from cases published in business and economic press. The dataset consists of data collected from articles and real case studies published in four economics and business journals, specifically Business week, Newsweek, The Economist and Financial Times in a horizon of 10 years. Data have been collected through several industrial sectors by electronic searching of keywords representing different governance structures prevalent in IFRs, i.e. outsourcing, off shoring, joint venture, alliance, partnership, consortia, and subcontracting. More specifically, data collection is realized by searching in different online journal articles outlining specific inter-firm relationships among two or more companies; from such articles the data constituting the sample are extracted.

A sample of 95 case studies is collected. Each case study provides information about the inter-firm objectives (listed in Table 2) manager wishes to pursue through the specific inter-firm agreement dealt in the case. Manager's intentions are either expressed by her/his direct declarations or journalist reporting about manager interview; such intentions are analyzed by the case evaluator who express a judgment about the presence and the importance of each inter-firm objective in the case by using the following scale:

- *3 = very significant*, the inter-firm objective is stressed with emphasis and/or repeated several times within the article;
- *2 = moderately significant*, the inter-firm objective is specifically mentioned in the article;
- *0 = not significant*, the inter-firm objective is never specified in the article.

The reason why this scale has been used, it will be clarified in the following. These data are collected for each article of the sample.

As the reader can notice, data are based on a judgment of the evaluator; of course, because of reader's interpretation in reading and understanding the article, such data can be affected by subjectivity. To overcome such limitation, two different analysts with the same cultural background have independently evaluated the same case.

Also, another limitation that might affect the dataset is the one concerning who wrote the article. Indeed, having selected articles from economic and business journals, the information might be influenced by the journalist views and/or by the ideological direction of the journal. Then, in order to reduce also this kind of subjectivity, for each case previously analyzed (*primary dataset*), another journal article, regarding the same agreement is found out by Google searching the company names involved in the agreement, the typology of agreement and the year in which the agreement is initialed (for example typing "sainsbury alliance skype 2006"). In this way a *validating dataset* for the same 95 cases of the *primary* one, is collected. The same two experts who have analyzed the cases of the primary dataset have also analyzed this validating dataset.

Therefore, each specific agreement (i.e. a case study) is codified in two different datasets, the primary, **I**, and the validating one, **II**, and by two different evaluators, *a* and *b*. I indicate with *i* ($i = 1, \dots, 95$) the index of the cases, with *j* ($j = 1, \dots, 16$) the index of the 16 inter-firm objectives of Table 1 of Chapter 3, with *h* ($h = \mathbf{I}, \mathbf{II}$) the dataset index and, finally with *k* ($k = a, b$) the evaluator index.

Let v_{ij}^{hk} be the evaluation of the k^{th} evaluator on the h^{th} dataset about the objective *j* of the case *i*. Let $\Delta_{ij}^h = |v_{ij}^{ha} - v_{ij}^{hb}|$ be the difference between the evaluations of *a* and *b*. Δ_{ij}^h can assume the following values: 0, *a* and *b* have provided the same evaluation; 1, *a* and *b* agree that the objective *j* is present in the case *i*, but they have provided different importance; 2, one of the two evaluators has recognized the objective *j* in the case *i*, while the other has not identified the objective itself; 3, one of the two evaluators has recognized the objective *j* as very significant in the case *i*, while the other has not identified it. As the reader can notice, by having used the previous scale of judgment, I obtain an assessment of evaluator differences as integer numbers from 0 to 3.

Firstly, in order to "clean" the two datasets of those cases introducing high level of disagreement, measured by $\sum_j \Delta_{ij}^l$, between the two evaluators, an ANOVA test is

applied independently and repeatedly to the two datasets Δ_{ij}^I and Δ_{ij}^II . In particular, for each dataset, the following hypothesis H0 is tested: “*there are no differences between two evaluations within the dataset*”; consequently, a 5% confidence interval ANOVA test has been applied to the initial 95 case studies. Each time the hypothesis H0 is rejected, the cases with the highest level of disagreement are deleted from the databases and the ANOVA test is repeated. After this recursive process the primary and the validating datasets result respectively of 86 and 83 case studies, which will be indicated respectively as **I'** and **II'**, that is by combining h and k , I am going to work with four sets of data $n = \{\mathbf{I}'^a, \mathbf{I}'^b, \mathbf{II}'^a, \mathbf{II}'^b\}$.

For each dataset, a symmetric correlation matrix whose generic element is the Pearson index, p_{jl}^n , is computed between the two vectors $\mathbf{v}_j^n = \{v_{1j}^n, \dots, v_{ij}^n, \dots, v_{Mj}^n\}$ and $\mathbf{v}_l^n = \{v_{1l}^n, \dots, v_{il}^n, \dots, v_{Ml}^n\}$, M being equal to 86 and 83 depending on the dataset, has been calculated. Of course, each correlation matrix reports values of p_{jl}^n , which resulted to have a statistical significance with a confidence interval of 5%.

4.4 Empirical Analysis: testing hypothesis 1

In order to test hypothesis 1, a modified version of the classical *k-means* algorithm has been developed. In this analysis inter-firm objectives in the datasets are grouped into clusters, such that groups are very different from each other and the objects in the same group are very similar to each other (Kantabutra and Couch, 1999). *K-means* is a data-mining algorithm that performs clustering. Classical *k-means* clustering divides a dataset into a number of groups such that similar items fall into same group. This algorithm uses an iterative procedure in order to cluster database (Ali et al., 2001). It takes the number of desired clusters and the initial means as inputs and produces final means as output.

In this study the purpose is to group strategic objectives into 3 clusters trying to maximize correlation among the objectives within the same cluster and minimize correlation among different clusters. Thus the following *k-means* model is formulated. Let x_{jc} be 1 if the objective j belongs to the cluster c , 0 otherwise. Of course, c assumes the following values: 1 = *Eff*, as Efficiency, 2 = *Kno*, as Knowledge and 3 = *Glo*, as Globalization.

For sake of clarity, I also indicate with p_{jl} the generic term of the correlation matrix, by omitting, at this time, the indication of the dataset.

The function expressing the total correlation within the three clusters is given by:

$$RWit = \sum_c \sum_{jl} p_{jl} \cdot x_{jc} \cdot x_{lc} \quad (1)$$

Equation (1) expresses that correlation index between objectives j and l will be summed up if and only if both the objectives belong to the same cluster c .

On the other hand, the function expressing the correlation between different clusters is given by:

$$RBet = \sum_{jl} p_{jl} \cdot x_{j1} \cdot x_{l2} + \sum_{jl} p_{jl} \cdot x_{j1} \cdot x_{l3} + \sum_{jl} p_{jl} \cdot x_{j2} \cdot x_{l3} \quad (2)$$

Equation (2) expresses that the correlation value between objectives j and l will be summed up only if both the objectives belong to the different clusters. Therefore, the *k-means* model is the following:

Objective function: Max (RWit – RBet)

Subject to:

$$\sum_c x_{jc} = 1, \forall j \quad (3)$$

$$\sum_j x_{jc} \geq 2, \forall c \quad (4)$$

Constraint (3) expresses that an objective must be assigned at least to one cluster, while (4) expresses that each cluster must be activated with at least two objectives in it.

As the reader can notice, the *k-means* model here proposed is an integer non-linear programming model. Although non linear, it is not difficult to solve, since the number of variables is quite limited. The problem has been solved by using the Lindo[®] Solver package. Table 3 reports the results of the clustering for all the datasets, with performance indexes.

Dataset (<i>n</i>)	Clusters	Objectives	RWit	RBet	Objective function
I^a	Eff	A, B, C, D, E, G, H, I	15.948	Eff,Kno 0.846	31.532
	Kno	F, J, K, L, M	9.252	Eff,Glo -0.87	
	Glo	N, O, P	5.634	Kno,Glo -0.67	
	Total		30.834	-0.7	
I^b	Eff	A, B, C, D, E, I, H	9.282	Eff,Kno -0.92	27.844
	Kno	F, G, J, K, L, M	10.486	Eff,Glo -0.09	
	Glo	N, O, P	6.612	Kno,Glo -0.46	
	Total		26.38	-1.46	
II^a	Eff	A, B, C, D, E, F, G, H, I	16.828	Eff,Kno -2	34.023
	Kno	J, K, L, M	7.404	Eff,Glo -2.12	
	Glo	N, O, P	5.945	Kno,Glo 0.266	
	Total		30.177	-3.85	
II^b	Eff	A, B, C, D, E, F, G, H, I	14.164	Eff,Kno -1.39	29.827
	Kno	J, K, L, M	7.065	Eff,Glo -2.11	
	Glo	N, O, P	5.65	Kno,Glo 0.562	
	Total		26.879	-2.94	

Table 3 Cluster analysis results

The *k-means* algorithm works appropriately. With the dataset **I^a**, the solution obtained provides a total internal correlation among the objectives within the cluster, $RWit = 30.834$; this is the sum of an internal correlation within the 3 clusters as depicted in the column *RWit* of Table 3. On the other hand, the total correlation among the clusters is quite low, being $RBet = -0.70$; this result is given by the sum of a correlation between the clusters in pairs as depicted in column *RBet* in Table 3. The same results are obtained for the other datasets and reported in Table 3.

It is to be noticed that the internal correlation of the clusters located by the algorithm is greater than the total internal correlation of the whole Pearson matrix. This means that the clustering provides a better internal correlation, even with an increased number of clusters. This is due to a good clusters separation that is measured by the low internal correlation among clusters. Moreover, the *k-means* algorithm has been tested with just two clusters activated for all the datasets. This basically means $c = 2$ in equations (1)-(4). By running the algorithm in this way, the optimal value of the objective function is lower than the one reported in Table 3 for all the datasets. This means that optimal clusters with $c = 2$ have a lower internal correlation and a higher external correlation than clusters with $c = 3$; therefore, how hypothesized, $c = 3$ is a better clustering for the objectives than $c = 2$. Hypothesis H1 appraisal according to the empirical findings is discussed in the next sub-section.

4.4.1 Appraisal hypothesis 1: results and discussions

Table 2 reports the results of the clustering for all the datasets. By analyzing these results, it is possible to evidence that: objectives A, B, C, D, E, H, I always characterize the Efficiency cluster; objectives J, K, L and M always characterize the Knowledge cluster; finally, objectives N, O and P always characterize the Globalization cluster.

On the other hand, objective G – *improving process quality* falls 3 times over 4 on the Efficiency cluster and F - *improving product quality* falls equally in the Efficiency and Knowledge clusters. The *k-means* algorithm is designed to put an objective just in one cluster for each dataset considered, as required by the constraint (3). However, since objective F falls equally in both clusters, according to the empirical results, is possible to conclude that:

- *Efficiency* cluster consists of the following inter-firm objectives: A, B, C, D, E, F, G, H, I;
- *Knowledge* cluster consists of the following inter-firm objectives: F, J, K, L, M;
- *Globalization* cluster consists of the following inter-firm objectives: N, O, P.

As far hypothesis H1 is concerned, it is strongly supported by empirical findings. Differently to what stated in H1, empirical results also put the inter-firm object F - *improving product quality*, among the objectives of the Knowledge cluster. On one hand this result is not surprising. Indeed, especially in case of high-tech and complex products, quality improvements are obtained also thanks to new technology developments, and therefore product quality improvement is strongly related with knowledge inter-firm objectives. On the other hand, it should be noticed that objective F position is strongly related with the dataset considered. Indeed, while in the primary dataset objective F falls into the Knowledge cluster, in the validating one, it falls into the Efficiency one.

These results highlights how deeper investigation is needed concerning quality objectives, and also, that inter-firm objective membership to cluster might depend on industry sector. However, hypothesis H1 is strongly supported by the empirical analysis and this leads to several conclusions reported in the final section of this chapter.

4.5 Empirical Analysis: testing hypothesis 2

In order to test hypothesis set H2, governance forms, which are present in the datasets, are grouped into three typologies:

- *Outsourcing (Out)*, collected cases concerning outsourcing, offshoring, and subcontracting;
- *Alliances (All)*, represents cases of alliances, partnerships and consortia;
- *Joint Venture (JV)*, accounts only for joint ventures agreements.

As discussed in Chapter 3, the above governance forms are located in a continuum between pure market transaction and hierarchy, outsourcing being the closest to the market and the JV the furthest. Therefore, an ordinal variable Y is associated to such governance forms; Y can vary from 1 to 3, being 1 the governance form closest to the market, i.e. *Out*, and 3 the furthest, i.e. *JV*.

Now, each case study i concerns just one governance agreement; however, each agreement may involve different inter-firm objectives; therefore, a generic case study i can be more or less involved with a specific cluster. For purpose of this study, it is useful to define a measure, as in (5), expressing the degree of membership of each case i to one of the three clusters previously defined, i.e. *Efficiency*, *Knowledge* and *Globalization*.

$$\mu_i^c = \frac{\sum_j v_{ij} \cdot x_{jc}}{3 \cdot N^c} \quad (5)$$

With $c = \text{Eff}, \text{Kno}$ and Glo and N^c being the number of inter-firm objectives characterizing the cluster c , that is $N^c = \{9, 5, 3\}$. The numerator of μ_i^c is the summation over all the objectives j which are present in case i and belonging, at the same time, to the cluster c ; this sum is normalized by dividing for the maximum value the numerator can reach, that is given by the product of N^c times the maximum value each evaluation can reach, i.e. 3. μ_i^c is computed for each dataset.

Now, by having indicated with Y_i the governance form associated to case i in order to test hypothesis set H2, I assume a multiple regression model as in (6):

$$Y_i = \alpha_i + \beta^{\text{Eff}} \cdot \mu_i^{\text{Eff}} + \beta^{\text{Kno}} \cdot \mu_i^{\text{Kno}} + \beta^{\text{Glo}} \cdot \mu_i^{\text{Glo}} + \varepsilon_i \quad (6)$$

According to H2a I expect a negative value for β^{Eff} , since more an IFR is an *Efficiency* one, i.e. an increasing value of μ_i^{Eff} , more the governance form should be oriented

towards the market, therefore a lower value of Y_i . From H2b I expect a positive value for β^{kno} and β^{Glo} .

Here, the dependent variable has an ordinal scale and since the difference in the degree of distance of a pure market transaction between different alliance governance forms is fixed and known, applying ordinary linear regression will produce biased results (Greene, 1990). Whereas, the most appropriate model for ordinal dependent variables is the *ordered probit* or *ordered logit* model. The criterion for selecting between the two models is linked to the study design, since the results of probit and logit are quite similar (Greene, 1990). Specifically, the assumption of the probit model is a normal distribution, which is more appropriate when the study design is experimental. In case of strategic management research the nature of the data is largely observational and for this reason it is more appropriate to assume a logistic model with a normal distribution. Moreover, since the dependent variable is a categorical one and can be ordered in any meaningful way, I choose an ordered logit regression instead of a multinomial one (Green, 1990). Indeed, multinomial logit regression is appropriate in cases where the response is not ordinal in nature as in ordered logit. Thus, four ordered logit regressions, one for each dataset, are specified to test H2. In Table 4, results are organized for each dataset.

The ordered logit model, also known as the proportional odds model, considers the odds ratio of an event independent for each category m , and constant for all categories. Essentially, this model simultaneously estimates $m-1$ multiple equations producing one set of coefficients for each independent variable so assuming parallel regression and expecting that the coefficients for the variables in the equations would not vary significantly if they were estimated separately. This assumption is called the *proportional odds* or the *parallel regression* assumption.

By using the *Brant* test (Williams, 2006) I check, for all four datasets, the parallel regression assumption to verify whether the parallel-line models are satisfied. If any of the test statistics are significant, this evidences the violation of the assumption and indicates that the ordered logit model may not be an appropriate specification to model reporting behavior. None variable is problematic with regards to the parallel regression assumption, since there are not significant tests, this means that the parallel assumption is not violated, and that ordered ordered logit model is appropriate to model reporting behavior. Hypothesis H2 set appraisal according to the empirical findings is discussed in the next sub-section.

Variables	<i>Dataset I^a</i>			<i>Dataset I^b</i>			<i>Dataset II^a</i>			<i>Dataset II^b</i>		
	Coefficients	Standard Error	Significant level	Coefficients	Standard Error	Significant level	Coefficients	Standard Error	Significant level	Coefficients	Standard Error	Significant level
μ^{Eff}	-4.30	1.48	0.004	-4.54	1.61	0.005	-3.72	1.50	0.014	-5.98	1.83	0.001
μ^{Kno}	2.86	0.93	0.002	2.26	0.99	0.023	2.60	1.03	0.012	2.65	0.93	0.004
μ^{Gio}	2.34	0.73	0.001	2.42	0.76	0.002	1.88	0.68	0.006	1.18	0.76	0.123
Log likelihood	-77.66			-79.2			-75.92			-72.81		
Likelihood ratio χ^2	33.47			30.38			26.21			32.43		
Pseudo R ²	0.177			0.160			0.147			0.182		
<i>n</i>	86			86			84			84		

Table 4 Ordered logit results

4.5.1 Appraisal hypothesis 2 set: results and discussions

The coefficients of the regression model in (6) are reported with their p -values and standard errors in Table 4. The negative signs of β^{Eff} in each dataset consistently support hypothesis H2a. Likewise, consistently with H2b coefficient β^{Kno} and β^{Glo} are positive. Only in the case of data set II^a the coefficient β^{Kno} , although slightly positive, it is not significant with a confidence interval at 95%. The empirical investigation about the hypothesis set H2 advances the understanding of governance structure choices in the process of strategic alliance formation.

Indeed, I proved that each strategic need is achieved by a particular typology of alliance such as outsourcing, alliance/partnership and joint venture. I found that when an inter-firm agreement is established to fulfill efficiency/effectiveness strategic needs, the contractual form used to formalize the agreement is more market oriented, such as outsourcing and alliances agreements. Whereas, when an inter-firm agreement is established to fulfill knowledge and learning or global market entry strategic needs the contractual form used to formalize the agreement is more hierarchy oriented, such as JV and non-equity alliance. Thus, findings from regression analysis allow concluding that the motivation to achieve a global strategy and the need to compensate for some absences or weaknesses in assets or competencies are strongly related with governance forms.

4.6 Conclusion

In this section I would like to discuss the principal outcomes of the research presented in this fourth chapter. It is to be noticed how the novelty of the study can be located both at theoretical and research methodological level. As described in the research questions in Chapter 1, the aim of the study is twofold. First, it aims at showing why managers enter alliances to basically satisfy three strategic needs: *efficiency/effectiveness*, *knowledge and learning* and *global market access*, each one characterized by a bunch of inter-firm objectives. Second, it aims at understanding if these clusters are correlated with particular alliance types. Here, through an empirical investigation I answered both of the questions.

The main finding from the appraisal of the first hypothesis is that companies enter into strategic alliances with complex and multiple inter-firm objectives. Indeed, the high internal correlation of the inter-firm objectives characterizing each cluster, compared

with the low external correlation, basically proves that firms want to realize a complex mixture of objectives from strategic alliances. For instance, the notion that firm enters alliances just to reduce its operative costs is not supported by the results presented here. Indeed, clustering shows that reducing operative costs is one of inter-firm objectives that is always achieved in strong correlation with others, belonging to the Efficiency cluster. The same consideration occurs to the other inter-firm objectives in the other two clusters, Knowledge and Globalization.

Furthermore, the empirical investigation about the hypothesis set H2 advances the understanding of governance structure choices in the process of strategic alliance formation, basically answering to the one of the most relevant theoretical question in the field: What types of contracts do firms use to formalize the alliance? According to the several theoretical approaches reviewed in section three, I proved that the three strategic needs are achieved by a particular typology of alliance such as outsourcing, alliance/partnership and joint venture.

From a theoretical perspective this finding leads up to several implications. First of all, observing the results of cluster analysis, I prove that three clusters exist, and that they are composed from a mixed portfolio of inter-firm objectives theoretically deducted from several theories. This finding demonstrates that even if each theoretical construction is useful to explain the alliances formation, it is also insufficient to explain the coexistence of different objectives in one strategic need. On its own, this means that none of the previous theoretical rationales are holistic. They each explain the formation of strategic alliances from a narrow point of view that is insufficient to capture the complexity of the strategic alliance formation. Therefore, the suggestion is that blending together various theoretical streams, such as Positioning school, Resource based view, Relational view, Evolutionary perspective, Transaction cost economics, and Institutional theory, provides a more useful mean in understanding the formation of strategic alliances.

From a methodological perspective, the approach used regards the use of dispersed textual information for research purposes. Indeed, most of the available information on a company is in the shape of documents, reports, manuals, web pages, journal articles and so forth. Indeed, a recent study indicates that 80% of a company's available information is contained in text (Tan, 1999). Typically, such textual information is unstructured and extracting meaningful information can be time-consuming and difficult. Actually, in order this information to be used for research

purpose they need to be codified in specific dataset, by extracting from text the necessary information.

From this point of view, such information can be considered as “secondary data”, since the textual information itself are provided for the purpose of the research; on the other hand, the construction of the dataset deriving from the textual information, is designed for the specific purpose of the research. Therefore, in order to use textual secondary data source, a methodology is needed to extract required information and to set them in a data set.

One of the most used methodologies is content analysis. According to Holsti (Holsti, 1969) content analysis is "any technique for making inferences by objectively and systematically identifying specified characteristics of message". It is used to determine the presence of certain words, concepts, themes, or phrases within text and to quantify their presence in an objective manner. It has strict procedures and criteria for selecting data, and the inclusion and exclusion of content is done systematically according to consistently applied rules. Content analysis is particularly useful for those who want to enumerate qualitative data to help establish frequencies and relationships within available textual information. In the research presented in this study, however, content analysis is not useful to build the required dataset; in this case, the information to be retrieved from the text needs a semantic interpretation from an expert. For instance the two phrases “gaining long term advantage from scale economies” and “reducing long term cost by increasing the dimension of the production” are not considered synonymous from a content analysis parser because they do not contain the same words or words synonymous; therefore, in order to catch the same concept from them, a semantic interpretation by an expert is needed.

In this case the use of human expert evaluation is necessary to build the required dataset. However, when using expert assessment, subjectivity is to be faced, while content analysis is free from such a problem. Furthermore, when information is retrieved from journal articles, another subjectivity introduced by the text source (the journal and/or the journalist in this case) is also to be faced. It is to be noticed, that this second kind of subjectivity can also affect content analysis when it uses journal textual information. The novelty of the proposed methodological approach for secondary dataset includes the evaluation of the subjectivity that affects these typologies of data. More specifically, two approaches are used to reduce subjectivity when using such datasets. First of all, in order to reduce the subjectivity in the expert

evaluation, a multiple evaluation (double in this case) plus an ANOVA procedure to eliminate those cases whose variability is higher than the natural variance of the data set are used. Second of all, in order to reduce the subjectivity due to the journalist/journal view a validating dataset is constructed. Of course, the use of intelligent semantic software parser could provide objective evaluation by making unnecessary the multiple expert evaluations plus the ANOVA analysis. However, up to my knowledge, no intelligent semantic software parsers are available for the specific of the research context faced in this study.

In conclusion, even if this empirical research advances the understanding on strategic alliance formation, these findings are subject to the several limitations, which point to directions for further researches presented in the following chapters. Here, the main threat to the external validity of this analysis is probably using secondary data sources. This narrows the scope of generalizability. Therefore, results provided in this chapter can be located at explorative level. While in this level theoretical hypotheses are confirmed, I would like to conduct a confirmatory analysis through a survey research methodology. Indeed, I validate the conceptual framework in two different industrial sectors: the Italian Machine Tool industry, and the Italian Biotechnology and Pharmaceutical industry. This is the path of further two chapters of this study.

Chapter 5

STRATEGIC NEED PERSPECTIVE TO INTER-FIRM RELATIONSHIPS: A CONFIRMATIVE ANALYSIS IN THE ITALIAN MACHINE TOOL INDUSTRY

5.1 Introduction

Today's competitive environment is characterized by an intensified competition resulting from market saturation, increasing demand for customized products and increasing technological innovation requirements. These facts have dramatically affected the character of manufacturing production requiring a high degree of flexibility, low-cost/low-volume manufacturing skills and short delivery times. To meet the requirements of today's market the rate of formation of strategic alliances has increased significantly over the last two decades in the manufacturing industry showing how the potential benefits provided by building long-term cooperative relationships are the right answer to an increasingly competitive environment (Dyer and Singh, 1998; Hagedoorn, 2002; Dyer et al., 2004).

This chapter, appraising the nature of Italian's Machine Tool (MT) industry, examines the conceptual approach to strategic alliance's formation, exposed in Chapter 3, within the Italian machine building companies. The main purpose of this chapter is to contextualize the conceptual framework, developed in Chapter 3 and empirically validated through a secondary data analysis in Chapter 4, by using primary data from an industrial manufacturing sector. I would like to validate the results obtained with the previous analysis by applying the same approach in the machine tools sector to greatly enhance both the validity and reliability of the research. In this way I can generalize the result across different settings. Therefore, I carried out a survey in collaboration with UCIMU, the Association of Italian Manufacturers of Machine Tools. I argue that MT industry is a good test-based since through collaboration agreements MT companies have developed their key competencies and strategies to compete effectively improving flexibility and quality, stimulating innovation, reducing lead times, and reaching new foreign market while simultaneously keeping costs down.

The chapter is organized as it follows. The chapter begins with a brief outlook of the machine tool industry. It moves on contextualizing the conceptual framework in the specific industry context. Then, it presents sample data, empirical analysis and results. Finally, the last section discusses the results and considers the validity and reliability of the study and potential limitations.

5.2 Research context: the Machine Tool industry

In the MT industry, Italy can claim an exceptional level of competitiveness being the fourth producer worldwide and the third in term of export (UCIMU, 2009). The structural model of this industry is characterized by a typical Italian production: small and medium enterprises, mainly localized in few areas and frequently owned and controller by families.

Starting from the sixties, in which the model was a vertical integrated one and the production was entirely carried out in-house, the way to produce of the Italian MT firms is deeply changed. Nowadays, MT builders basically leave outside the production of standardized components because of small scale and, sometimes, also the design of machines and software planning because of lack of skilled resources in-house. From a case study analysis Poledrini (Poledrini, 2008) finds that Italian MT firms are increasing the collaboration agreements with their strategic suppliers because of a shrinking of knowledge. Moreover, Grossman and Helpman (Grossman and Helpman, 2005) emphasize how firms create agreements with overseas local partner to expand set of activities and reach a global context.

As it is possible to notice all the previous changes are the consequences of a necessity to fulfill a strategic need. So, the MT industry is a very interesting test-bed for analysing the creation of strategic alliances. Indeed, the MT is a complex knowledge based product, in which it is possible to achieve innovation through the integration of multidisciplinary expertise such as electronics, mechatronics, kinematics, new materials and so forth. From this point of view the manufacturer of machine tools is a “knowledge integrator”. Indeed, in the MT industry, innovation is developed by building dynamic inter-firm relationships in which MT manufacturers integrate, in their products, specific knowledge coming from different industries such as electronics (i.e., controls), electrical (i.e., linear motors), new materials (i.e., composite materials), etc. Therefore, there is a strategic need of *knowledge and*

learning to innovate in this industry. In an industry where the knowledge base is so complex and the expertise are widely dispersed, in order to innovate and develop new and competitive products firms create alliances, such as for example the partnership signed in 2009 between MAG and Samputensili (Samputenili News, 2009). The purpose of the partnership is to coordinate sales, application expertise and service operations for the joint gear manufacturing products. Specifically, integrating complementary technology and combining manufacturing's processes knowledge, the principal aim of the agreement is a common product development plan for a new generation of gear machining centers.

However, the industry is not characterized only by product innovation needs. The growing competition pressures due both to the presence of new competitors coming from Korea and China characterized by a lower labour costs, and the increasing market globalization, is shifting the competition towards the Asiatic economies. Considering such perspective, the MT builders have to accomplish an *efficiency and effectiveness* strategic need to improve the competitiveness of the industry and reach an advantage. Example of this is the agreement of merger between Favretto and Maccanodora in 2006 (Marketpress Info, 2006). Among the several aims of this strategic cooperation the principal is to create an Italian's premier MT company characterized by high level of diversification, flexibility of production, and scale positions in a dynamic market.

Finally, it is to note that Italian MT industry has always been characterized by close producer-user relationships and the tendency to customize final products according to users' needs. Furthermore, since the MT builder requires staying close to the final customer for issues such as maintenance, support, training, follow-up development and product customization, the market globalization needs more and more the presence of MT manufacturers in foreign countries. A relevant example is the strategic alliance signed in 2010 between FMT-Future Manufacturing Technology and IMT-Italian Machine Tools (Axent news, 2010). With this alliance is created a new European master in one of the highest technological content area: the holding is today the biggest group in Italy and one the first in Europe among those companies specialized in the very high-precision machine tools. The main objective of this project is to create a holding able to expanding its presence in emerging markets to exploit the higher rate of growth of foreign countries and significantly increase the its local market share.

Such considerations express a global market access strategic need that can be accomplished by making inter-firm relationships with local partners, who have a deeper knowledge of customers and foreign manufacturing markets, allowing to face coordination issues with final customers.

These issues show how the question of inter-firm relationships in an industry such as MT is strategic for firm competitiveness. Indeed, considering a survey conducted by UCIMU in the nineties that recorded the trend of agreements in the industrial automation field, it is possible to notice how this tendency is changed in the last two decades (Rolfo, 1993). UCIMU's survey underlines only 41 cases of agreements concluded by Italian manufacturers in the period between 1980 and 1991. The comparison of these results with those obtained with our survey reveals a more consistent number of agreements by Italian MT builders, showing how the use of strategic alliance and outsourcing agreements is becoming strategic for this industry.

5.3 Contextualizing the theoretical framework in the Machine Tool industry

In the following two sub-sections I contextualize the general conceptual framework taking into consideration the specific features of Italian MT industry. Specifically, considering the explanations made before in section two, I modify the composition of previous clusters including or eliminating specific inter-firm objectives. Therefore, compared with the general conceptual model of Chapter 3, here the clusters are always composed from a mixed portfolio of inter-firm objectives but this mix is different. The most important advantage of contextualizing a theoretical model is that researchers can investigate deeply into the underlying logics and structures behind the phenomena, and not simply to catalog them (Weick, 1999).

5.3.1 Contextualizing hypothesis 1

In strategic literature several scholars have highlighted how strategic alliances can enhance efficiency and effectiveness of a firm focusing on a set of specific inter-firm objectives mainly concerning cost, time, quality and financial risk reduction (Gulati, 1998). From a survey conducted by Elmuti (Elmuti, 2003) it was demonstrated that strategic alliances can enable partners to lower costs by taking advantage of *long-term economies* such as scale, scope, and/or experience effects (Contractor and Lorange, 1988; Varadarajan and Cunningham, 1995; Alvarez and Barney, 2001). In particular,

in the MT industry, it has been estimated that the average cost per unit of new machine tools tends to decline by 20 per cent each time the cumulated output is doubled, due to improvement in efficiency through learning by individuals and organizations (Pratten, 1971). Therefore, in a production where learning is an important issue, firms use strategic agreements to specialize the production reducing average costs.

Strategic alliances have also been undertaken to reduce *operative cost*. The attention of manufacturers is focused on reducing their operating costs, but they may not be able to achieve this objective just buying more productive machinery. According to several scholars, outsourcing relationships are highly specific for reducing operative costs by externalising activities to high-specialised companies (Frayer et al., 2000; Elmuti, 2003). Moreover, in many supplier-customer relationships has been observed that strategic alliances allow reducing costs related to inventory, order processing and information sharing (Van Laarhoven and Sharman, 1994).

Also *labour cost reduction* has been observed as an inter-firm objective in alliances (Sia and Bruton, 2005) and outsourcing contracts. This is especially true in the MT industry, in which the final product is manually assembled and the incidence of the labour cost over the total cost is quite significant. Then through manufacturing strategic alliances the production can be transferred to the lower cost developing countries (Contractor and Lorange, 1988).

As far as time related objectives are concerned, strategic alliances are developed both to reduce lead times and time to market. *Lead-time reduction* is particularly observed in supply chain oriented alliances whose objective is to achieve time responsiveness (Perry et al., 1999). The MT companies try to reduce the production lead-time in order to allow customer to start production as soon as possible improving, in this way, their satisfaction; of course the selection of an excellent supplier is the key to obtain this advantage. Furthermore, also in the MT industry, the outsourcing of electronics manufacturing through contract manufacturing produces low-cost, high-quality products with short lead times (Lonsdale and Cox, 2000).

Time to market reduction was observed as one of the primary motivations for alliances in Yasuda (Yasuda, 2005). European machine tool builders had successfully coped with competition from the Japanese and Koreans reducing the time to introduce new products to market by shifting its operations to “buy-in” parts rather than manufacture them in-house (Kulwant et al., 1994). Thus, strategic alliances as well as outsourcing

have the potential to expedite development times, since resources will be on hand when needed, especially at short notice (Power et al., 2004).

Quality improvements provide additional advantages to accomplish the strategic need of efficiency and effectiveness since through alliances firms are able to reduce scrap and defect rates. The strategic focus of the majority of MT manufacturers was found to emphasize product quality recognizing that quality along with customer services and delivery times are important factors that may differentiate one machine tool from another (Shaw, 1995). *Product quality* objective is achieved especially in supply chain strategic alliances where quality improvements can be obtained through partnerships with critical suppliers by modifying the product design (Carter and Ellram, 1994). Consistently with this argument, research has shown that many firms using repeated supplier interactions are able to produce new products in less time, at a lower cost, and with higher quality (Birou and Fawcett, 1994). On the other hand, being the production process characterised by manually assembled operations of low volumes, process quality is not a significant objective for achieving efficiency in MT industry. Finally a specific inter-firm objective, closely related to the sector peculiarity, is the *production flexibility*. Generally, MT sales are strongly cyclic and the plant may need either more volume to meet unexpectedly high success rates or less volume when unsuccessful bids are made. Flexibility, one of the basic characteristics of any production process, provides significant advantages to accomplish the strategic need of efficiency and effectiveness (Vickery et al., 1999). Since the main source of variability for one organization is the quantities in demand, thus volume flexibility is required. In order to become volume flexible firms may choose among different strategies such as creating inter-firm relationships with strategic suppliers that allows firm to use their competencies and incorporate their capabilities into firm's manufacturing strategies (Narasimhan and Das, 1999). Moreover, outsourcing and strategic alliances enable organizations to manage the source of demand and/or to enhance control of the inputs through ownership of supply and distribution channels (Cooper et. al, 1997).

The acquisition of knowledge and the development of organizational learning are also primary reasons why firms establish alliances. A considerable number of scholars describe the use of alliances to acquire new capabilities, new knowledge and skills from alliance partner's capabilities, as being able to provide a superior competitive

advantage (Kogut, 1988; Hamel, 1991; Mowery et al., 1996; Inkpen, 1998). The need of knowledge and learning can be fulfilled through strategic alliances by pursuing the following set of inter-firm objectives (Inkpen, 1998): developing new capabilities and skills, developing innovative products and new process technologies.

As several researchers have demonstrated one of the most cited reason underlying strategic alliances formation is to seek out knowledge by *acquiring new knowledge and skills* from the allied partner (Hamel, 1991; Powell and Brantley, 1992; Mody, 1993). Being the machine tool a knowledge-based product, certainly a key critical factor in the development of the industry is the continuous acquisition of new external knowledge and the re-building of the internal knowledge base via cooperation such as in R&D alliances (Wengel and Shapira, 2004; Liang-Chih Chen, 2009). Therefore, the need of R&D capabilities depends on both the internal knowledge base and the degree of new access to the external knowledge base such as technologies, know-how, and organisational practices (Inkpen, 2000). The access to this external knowledge can, in several forms, including informal learning, licensing, strategic alliance, co-development, and so on. In the automotive industry, for instance, it was demonstrated that the acquisition of knowledge was the main objective in the joint venture between GM and Toyota (Buckley, 1992; Contractor and Lorange, 1988).

In a market place characterized by rapid changes, manufacturing companies must be able to adapt quickly by innovating their products, processes or services. Innovations in the MT industry is typically incremental and is based on the application of novel combination of knowledge arising from the builder' persistent efforts to satisfy requests from their customers (Lissoni, 2001). Several examples in this industry show that knowledge linkages established by MT firms with their local production networks, i.e. with users, suppliers and public research institutes by using strategic relationships are especially conducive to technology acquisition and innovation. A recent work on Taiwanese MT industry has illustrated how the transnational strategic alliances can be effective instruments of technology acquisition for Taiwanese firms (Liang-Chih Chen, 2009). In countries like Japan, Korean and China MT companies, cooperating directly with technology owners, use strategic alliances, such as licensing agreements, to acquire advanced technology as well as design and production know-how to build up new learning and capabilities able to innovate processes and products. Strategic alliances contributing significantly to the acquisition of information about external sources facilitate the innovation process. Therefore, when the main objectives

are significant and quick innovations, these are likely to result from the fusing of complementary alliance partners, rather than to be achieved by one firm acting alone (Narula and Hagedoorn, 1999).

Finally, another inter-firm objective strictly related to the industry under investigation is the *product diversification*. Indeed, in the MT industry firms are mainly specialized in one or two types of machines for which they can usually offer a certain range of models customized on customer needs.

The diversification within the sector has concerned the shift of several firms towards the production of cells and Flexible Manufacturing Systems (FMS). This shift has involved the acquisition of new know-how as well as the need to integrate equipment produced by outside sources. Forming alliances with firms providing complementary resources is becoming the primary strategy to spread the production mix for achieving a sustained competitive advantage in the global marketplace (Osborn and Hagedoorn, 1997; Dyer and Singh, 1998). Specifically, scholars (Gomes-Casseres, 1989; Farjoun, 1998) have proved that diversify product range through international joint venture or alliances provides learning opportunities through exposure to new markets, internalization of new concepts or ideas from new cultures, access to complementary partner resources, and exposure to new competitors and terms of competition.

Motives for formation of strategic alliances extend beyond pure financial and knowledge/learning objectives, to encompass also the creation of new market opportunities (Varadarajan and Cunningham, 1995; Hitt et al., 2001). Historically, firms have tried to enter in new and foreign markets and businesses to research growth and profitability using different entry strategies, such as strategic alliances (Contractor and Lorange 1988; Glaister and Buckley, 1996). Strategic alliances whose primary purpose is to fulfil the need to globalize the market are focused on a set of specific inter-firm objectives mainly concerning new market penetration, developing of new business segments and increasing market share.

It has been shown that the MT industry is primarily an export oriented one, with manufacturing outside the home country (Jones et al., 1992; Young and Hood, 1992). In servicing foreign markets through exports, companies are thus faced with a choice of creating strategic alliances with local agents or distributors, that are familiar with the local environment, legal and political regulations, regulatory barriers to entry as well as local distribution channels and advertising agencies. These partners having an

in-depth knowledge of local markets may contribute to enhancing the penetration and/or development of *new market* (Varadarajan and Cunningham, 1995). Therefore many firms seek to exploit the opportunities of new markets by building links with local partners in order to gain global market access (Glaister and Buckley, 1996).

Another way to become more global is to *develop new business sector*. As illustrated by different alliances in the automotive industry, such as U.S. manufacturing company GM's alliances with Japanese competitor Isuzu and Suzuki or Chrysler and Mitsubishi, firms enter into strategic alliances in order to extend existing business segments and, consequently, foster globalization (Contractor and Lorange, 1988). In the MT industry developing new segment concerns the entry of groups not belonging to the traditional MT sector (Rolfo, 1993). Then, strategic alliances also allow manufacturing companies to diversify into attractive, but unfamiliar, business areas, providing a less risky means of entering new markets.

Finally, firms can improve the access to new markets and strengthen their competitive success by securing stronger positions through consolidation of firm's existing *market share* (Glaister and Buckley, 1996; Eisenhardt and Schoonhoven, 1996; Barringer and Harrison, 2000; Das and Teng, 2000). In order to protect competitive position in the home market, firm makes cooperative agreements to be able to access new global markets. Moreover, these agreements improve existing market share and lay the foundation for future alliances with the same partners in foreign markets. Caterpillar's alliance with Japanese Mitsubishi is an illustrative example of the use of the strategic alliances as a strategy to confine competition overseas in order's to protect market position in the home market (Varadarajan and Cunningham, 1995).

From the above discussion I locate 14 inter-firm objectives listed in Table 5. The literature analysis on IFRs and strategic agreements in the MT industry suggests how inter-firm objectives from A to G are mainly related with *efficiency/effectiveness needs*, i.e. such inter-firm objectives are a mean to pursue efficiency/effectiveness. On the other hand, objectives from H to K are mainly related to *knowledge/learning needs* and, finally, objectives from L to N are mainly concerned to *global market access needs*.

Code	Inter-firm objectives
A	Long term economies
B	Reducing labour cost
C	Reducing operative cost
D	Reducing lead time
E	Reducing time to market
F	Improving product quality
G	Improving production volume flexibility
H	Acquiring and developing new knowledge
I	Developing innovative product
J	Developing innovative production process
K	Diversifying product mix
L	Entering and developing new markets
M	Entering and/or developing new business segments
N	Improving market share

Table 5 Inter-firm objectives in Machine tool industry

As already explained for the general conceptual framework, also here managers of machine tool companies basically pursue strategic needs when they make IFR decisions. This implies that inter-firm objectives that contribute to obtain the same strategic need are pursued in strong correlation each other, that is manager pursues them in cluster when they make inter-firm agreements. These clusters are named according to the three strategic needs: *Efficiency*, *Knowledge*, and *Globalization*. Clusters are characterised by a strong internal correlation among the objectives and weak external correlation among objectives of different clusters. According to this reasoning the following hypothesis can be stated:

Hypothesis 1: *Inter-firm objectives can be grouped in the following clusters: (a) Efficiency cluster consisting of objectives from A to G; (b) Knowledge cluster consisting of objectives from H to K; (c) Globalisation cluster consisting of objectives from L to N.*

5.3.2 Contextualizing hypothesis 2 set

In this section I would like to proof that, also in this specific context, the three strategic needs are achieved by a particular typology of alliance such as outsourcing, off-shoring, alliance, partnership, and so on.

As already predicted in Chapter 1 and Chapter 3, strategic alliances can be ranked on a continuum between contractual market agreements, i.e. the *market*, and complete

internalization, i.e. the *hierarchy*. Between these two extremes a range of inter-firm organizational modes can be located depending on the degree of interorganizational interdependency and the level of internalization.

Unlike the previous research context in which are represented governance forms like outsourcing, off-shoring, subcontracting, alliance, partnership, consortia and joint venture, in the MT industry I also consider a new form of IFRs, namely merger and acquisition. In Chapter 2 I already discussed why M&A are considered among the strategic alliance forms.

As it is well known, outsourcing is a “buy” decision, that is a company decide to externalize some activities previously done inside; therefore, according to the main stream of literature on hybrids (Williamson, 1991; Menard, 1996), outsourcing is the closest governance form to the *market*. On the other hand, joint venture is a governance form that foresees the creation of a new company that internalises some assets or activities of the parent companies; therefore, it is a governance form closer to the *hierarchy*. Whereas, an alliance/partnership solution is generally a contractual arrangement among separate entities; therefore, in a continuum between *market* and *hierarchy*, it lays in the middle between outsourcing and JV. Finally, a Merger or an Acquisition (M&A), is defined as a distinct alternative between strategic alliances and other inter-firm relationships (Barney, 2002) and it is considered a “make” solution because of is a governance form that internalises the assets or the activities to be accomplished during the inter-firm relationship. Therefore M&A is a governance form closest to a *hierarchy*.

Remaining valid the same theoretical considerations depicted in Chapter 3, the following hypotheses can be stated:

Hypothesis 2a: *When the main strategic need is to gain efficiency/effectiveness, IFR governance forms are market oriented and therefore closer, in decreasing order, to outsourcing and non-equity alliances.*

Hypothesis 2b: *When the main strategic need is either to gain knowledge/learning or to globalize, IFR governance forms are more hierarchy oriented and therefore closer, in decreasing order, to merger and acquisition, joint ventures and alliances/partnerships.*

5.4 Characteristics of the sample and data collection

In order to empirically test the theoretical framework, a survey is carried out in collaboration with the Association of Italian Manufacturers of Machine Tools, UCIMU. The survey is conducted through a mailed survey questionnaire, reported in Appendix, that is pre-tested, and subsequently administered and analysed. Among 205 MT Italian builders, which are member of UCIMU association, I selected a list of 100 MT firms characterized by a “special UCIMU mark”. This mark qualifies the company as firm with quality features that promotes technical ability, functional efficiency and production system organization. This is a very significant sample of the industry, since its firms collect about the 50% of the total turnover and about the 70% of the total export of the industry (UCIMU, 2009). This pre-screening ensured that the firm respondents are qualified to report on the firm’s general behavioural tendencies and attitudes towards IFRs. 11 companies of this initial sample are omitted by the analysis; since, 10 companies are in receivership or in redundancy fund, while one of them is more oriented to robots production. The remaining sample of 89 companies, composed of 13 large, 54 medium and 22 small companies, is consistent with the structure of industry.

Among 205 pre-screening firms, 89 questionnaires are delivered and 33 returned and within this sample, are collected 83 agreements: 23 alliances/partnerships; 5 joint ventures; 25 mergers and acquisitions; and, 30 outsourcing. I received 33 completed questionnaires, with a response rate of 37%. Because of a significant number of companies in the survey sample failed to respond I controlled if there is a difference between respondents and non-respondents evaluating non-response bias (Armstrong and Overton, 1977). Comparing the respondents with the non-respondents on company sales volume and number of employees, and comparing the early and late respondents on the model variables, that is the inter-firm objectives (Armstrong and Overton, 1977), the *t*-tests showed no significant differences, suggesting that response bias is not a significant problem in this study.

A theory-testing questionnaire is designed. I pre-tested the questionnaire through in-depth interviews with executives from a small number of firms. I interviewed respondents and discussed the goals and objectives of the study in general terms, after which they completed the questionnaire. During the survey I assured that every

section of the questionnaire is addressed by the person in the company having the right knowledge to proper respond to the questions.

The test of the hypotheses requires that the respondent, through the questionnaire, is able to assign values to specific variables. Therefore, I included in the questionnaire questions associated to the variables object of this study.

Firstly, I asked each company to list the inter-firm agreements addressed in the last ten years. Inter-firm agreements are grouped in: outsourcing, alliances, joint ventures and merger and acquisition. In order to address hypothesis 1, for each inter-firm agreement mentioned by the company, I asked the respondent manager to assess how important is each one of the strategic objective listed in Table 5 for pursuing the strategic needs. In order to do that, I used multiple-item Likert scale. For assessing the set of hypotheses 2 I have associated to each inter-firm agreement typology the list of strategic objective importance.

5.5 Empirical Analysis: testing hypothesis 1

As previously mentioned, I collected 33 questionnaire containing 83 agreements that are the unit of analysis. Let indicate with j the agreement index, $j = 1, \dots, 83$ and with $i = 1, \dots, 14$ the inter-firm's objective index. Let also indicate with v_{ij} the importance of the i^{th} inter-firm objective in the j^{th} agreement.

Variables	Obs	Mean	Std. Dev.	Min	Maz
A	83	2.216	1.506	1	5
B	83	2.289	1.518	1	5
C	83	1.807	1.365	1	5
D	83	2.518	1.355	1	5
E	83	2.240	1.312	1	5
F	83	2.253	1.480	1	5
G	83	2.216	1.473	1	5
H	83	2.469	1.640	1	5
I	83	2.180	1.466	1	5
J	83	1.638	1.042	1	5
K	83	2.337	1.712	1	5
L	83	2.650	1.837	1	5
M	83	2.746	1.846	1	5
N	83	2.638	1.784	1	5

Table 6 Descriptive statistics of machine tool industry data

First of all descriptive statistics have been provided for the inter-firm objectives. Table 6 reports the mean, the standard deviation, the minimum and the maximum for each

inter-firm objective i . In order to test hypothesis 1, as already done in the previous chapter, I developed a modified version of the classical k -means algorithm. Since the model and the resolutions are the same I refer to Chapter 4 for the explanation of k -means clustering analysis, reporting here just the results. Table 7 reports the results of the clustering with performance indexes.

Clusters	Objectives	RWit	RBet	Objective function
Eff	B, C, D, E, G	7.087	Eff,Kno	0.51
Kno	A, F, H, I, J, K	15.996	Eff,Glo	-1.140
Glo	L, M, N	7.538	Kno,Glo	0.63
		30.62		0.00

Table 7 Initial cluster results

The k -means algorithm works appropriately. The solution obtained provides a total internal correlation among the objectives within the cluster, $RWit = 30.62$; this is the sum of an internal correlation within the 3 clusters as depicted in the column $RWit$ of Table 7. On the other hand, the total correlation among the clusters is $RBet = 0$; this result is given by the sum of a correlation between the clusters in pairs as depicted in column $RBet$ in Table 7. The correlation within the three clusters of Table 7 is equal to the total correlation of the Pearson matrix involving all the 14 objectives. This testifies a good clusters separation. Moreover, the k -means algorithm is tested with just two clusters activated for all the datasets. By running the algorithm in this way, the optimal value of the objective function is lower than the one reported in Table 7. This means that optimal clusters with $c = 2$ have a lower internal correlation and a higher external correlation than clusters with $c = 3$; therefore, how hypothesized, $c = 3$ is a better clustering for the objectives than $c = 2$.

By analyzing the clustering analysis results in Table 7 is possible to conclude that:

- *Efficiency/effectiveness* cluster consists of the following inter-firm objectives: B, C, D, E, G;
- *Knowledge and learning* cluster consists of the following inter-firm objectives: A, F, H, I, J, K;
- *Global market access* cluster consists of the following inter-firm objectives: L, M, N.

A robustness analysis is conducted aimed at understanding if the solution obtained is well separated from other possible clusters. As a matter of fact, I found another possible clustering, whose characteristics have been reported in Table 8.

Clusters	Objectives	RWit	RBet	Objective function
Eff	A, B, C, D, E, G	9.67	Eff,Kno	0.53
Kno	F, H, I, J, K	13.37	Eff,Glo	-1.140
Glo	L, M, N	7.54	Kno,Glo	0.63
		30.58		0.02

Table 8 Alternative cluster results

As the reader can notice the clustering in Table 8 differs from the one in Table 7, just because the position of the objective A - *long term economies*, that here falls in the Efficiency cluster, while in the previous one in the Knowledge cluster. Also it should be noticed that the solution in Table 8 differs from the one in Table 7 just for 0.2% less than the previous solution.

From this analysis it comes that inter-firm objective A can be indifferently clustered in the Efficiency and Knowledge clusters. Both the clusters will be considered for the appraisal of hypothesis set 2, while hypothesis H1 appraisal, according to the empirical findings, is discussed in the next section.

5.5.1 Appraisal hypothesis 1: results and discussions

Table 7 and Table 8 report respectively the results of the initial and alternative clustering analysis with performance indexes. As far hypothesis H1 is concerned, while Globalization cluster is fully confirmed since it contains all the predicted inter-firm objectives, composition of Efficiency and Knowledge clusters needs some further discussions. Indeed, cluster analysis results differ from hypothesis 1 only for the position of inter-firm objective F - *improving product quality*, while the objective A - *long term economies*, as already highlighted, can be indifferently clustered under Efficiency and Knowledge clusters.

The following discussion can find useful insights from the analysis of the Pearson indexes (those different from 0) of the two inter-firm objectives under discussion with other inter-firm objectives, whose values are organized in Table 9.

	A	B	F	G	H	I	J	L
A	1	0.48	0.5	0.31	0	0.31	0	0
F	0.5	0	1	0	0.48	0.61	0.42	-0.28

Table 9 Pearson index of inter-firm objectives A and F

Regarding A - *long term economies*, it should be observed how long-term economies mainly concern with scale/scope and learning economies. As it is well known scale/scope economies are more related with production scale dimension. Lee and Lim (Lee and Lim, 2001) have pointed out how, in MT industry, the important knowledge about production cannot simply be embodied in production equipment, since the equipment used in the production process is a usually general-purpose machine. Indeed, Kotha and Nair (Kotha and Nair, 1995) well describe as scale/scope economies are obtained in machine tool industry by standardizing components and designing modular machine, so that machine manufacturer can subcontracting standard components to low-cost and high-volume specialized suppliers. This is even truer for Italian manufacturer that, as already pointed out, have smaller dimension compared with their German or Japanese competitors. In conclusion, MT builders are final assemblers therefore the skills accumulated by the workforce are more important than equipment. The above considerations lead to the conclusion that long-term economies in MT industry are closely related to “learning by doing” effect.

Moreover, it should notice from Table 9 how objective A - *long term economies* has a strong correlation with inter-firm objective B - *reducing labor cost* (0.48), and objective G - *improving production volume flexibility* (0.31), both belonging to the Efficiency cluster. This is quite evident since the increased manpower productivity gained by the “learning by doing” effect allows reducing the labor cost and, in the same time, increases the maximum production capacity obtainable by the available operators, i.e. the production volume flexibility. On the other hand, A - *long term economies* is strong correlated with inter-firm objective F - *improving product quality* (0.50), and I - *developing innovative product* (0.31) both falling in Knowledge cluster. The reason why A and F are strongly related is quite evident too; indeed, while operators acquire expertise through learning they also improve the quality of the product. Less evident, but still significant is the relation between A and I; indeed, as the MT industry absorbs the technology from electronic and mechatronics, assembling activity requires those knowledge and skills necessary to accomplish tasks

characterized by a high technical complexity. Therefore, more operators become skilled, more they are able to support product innovation. By comparing the Pearson indexes of A with the other inter-firm objective results evident why A can be indifferently clustered in the Efficiency and Knowledge clusters and, furthermore, how the belonging of such inter-firm objective to the Knowledge cluster depends on the position of the inter-firm objective F.

Of course much of the reasoning previously done holds also for quality improvement. From Table 9, F - *improving product quality* is strongly correlated with inter-firm objectives H - *acquiring and developing new knowledge*, I - *developing innovative product* and J - *developing innovative production process* evidencing how quality improvement, in the MT industry, is perceived as objective related to knowledge need instead of efficiency need. Indeed, since volumes are low and product highly customized, issues such as statistical control process have low impact in the machine quality. On the other hand, in this industry, quality improvement is essentially related with vertical differentiation, that is higher performances of the machine (higher precision, higher productivity, less energy consumption, and so forth) and/or with customization, that is the ability to meet specific requirements of the customer (for example a customized tool handling system). Then, it is quite evident that in order to improve quality, firms need to improve their technological knowledge and the ability to understand and solve customer's problems. This is the reason why quality improvement is seen as a way to satisfy knowledge and learning need. Furthermore, the reader should notice how the position of F - *improving product quality* was uncertain in the secondary data clusters, since the inter-firm objective "product quality" was included once in the Efficiency and once in the Knowledge cluster. The result here, testify how, depending on industry, product quality can be more related to knowledge needs than efficiency ones.

Summing up, the different position of objective A - *long term economies* suggests how the belonging of inter-firm objectives to the three clusters can be industry dependent. Indeed, while quality improvement in most of the manufacturing industries is seen as a way to improve efficiency through scraps recalls and warranty costs reduction, in the MT industry quality is more related to knowledge need.

5.6 Empirical Analysis: testing hypothesis 2 set

In order to test hypothesis set H2, governance forms have been grouped into three typologies:

- *Outsourcing (Out)*, within this typology I collected cases concerning outsourcing and offshoring;
- *Alliances (All)*, this category represents cases of alliances and partnerships;
- *Merger and Acquisition (M&A)* and *Joint Venture (JV)*, M&A and JV have been grouped together because in the sample only 6 JVs are present, therefore, they are considered together with M&A agreements.

As previously discussed the above governance forms are located in a continuum between pure market transaction and hierarchy, outsourcing being the closest to the market and M&A the furthest. Therefore, an ordinal variable Y is associated to such governance forms; Y can vary from 1 to 3, being 1 the governance form closest to the market, i.e. *Out*, and 3 the furthest, i.e. *JV* and *M&A*. The reader should notice that joint venture and merger and acquisition have been considered together as the closest form to hierarchy.

Now, each agreement j involves just one governance typology; however, each agreement may involve different inter-firm objectives; therefore, a generic agreement j can be more or less involved with a specific cluster. Thus, it is useful to define a measure, as in (7), expressing the degree of membership of each agreement j to one of the three clusters previously defined, i.e. *Efficiency*, *Knowledge* and *Globalization*.

$$\mu_j^c = \frac{\sum_i v_{j,i} \cdot x_{i,c}}{5 \cdot N^c} \quad (7)$$

With $c = \text{Eff}, \text{Kno}$ and Glo and N^c being the number of inter-firm objectives characterizing the cluster c , that is $N^c = \{5, 6, 3\}$. The numerator of μ_j^c is the summation over all the objectives i which are present in the agreement j and belonging, at the same time, to the cluster c ; this sum is normalized by dividing for the maximum value the numerator can reach, that is given by the product of N^c times the maximum value each evaluation can reach, i.e. 5.

Now, by having indicated with Y_j the governance form associated to case j in order to test hypotheses set H2, I assume a multiple regression model as in (8):

$$Y_j = \alpha_j + \beta^{Eff} \mu_j^{Eff} + \beta^{Kno} \mu_j^{Kno} + \beta^{Glo} \mu_j^{Glo} + \varepsilon_j \quad (8)$$

According to H2a I expect a negative value for β^{Eff} , since more an IFR is an *Efficiency* one, i.e. an increasing value of μ_j^{Eff} , more the governance form should be oriented towards the market, therefore a lower value of Y_j . From H2b I expect a positive value for β^{Kno} and β^{Glo} .

As in model presented in Chapter 4, the dependent variable has an ordinal scale and according to the considerations already done the appropriate model is the *ordered logit*. The results of the ordered logit regression are organized in Table 10 for the initial clustering solution showed in Table 7, and in Table 11 for the alternative cluster of Table 8. The coefficients of the regression model in (8) have been reported with their p -values and standard errors.

Variables	Coefficients	Standard Error	Significant level
μ^{Eff}	-2.59	1.64	0.11
μ^{Kno}	6.86	1.50	0.00
μ^{Glo}	4.85	0.91	0.00
Log likelihood	-61.72		
Likelihood ratio χ^2	57.7		
Pseudo R ²	0.318		
n	83		

Table 10 Ordered logit results for initial clustering

Variables	Coefficients	Standard Error	Significant level
μ^{Eff}	-2.77	1.68	0.09
μ^{Kno}	6.03	1.28	0.00
μ^{Glo}	4.82	0.91	0.00
Log likelihood	-61.47		
Likelihood ratio χ^2	58.1		
Pseudo R ²	0.32		
n	83		

Table 11 Ordered logit results for alternative clustering

The ordered logit model, also known as the proportional odds model, considers the odds ratio of an event independent for each category m , and constant for all categories. Essentially, this model simultaneously estimates $m-1$ multiple equations producing one set of coefficients, as in Table 10 and 11, for each independent variable so assuming parallel regression and expecting that the coefficients for the variables in

the equations would not vary significantly if they are estimated separately. This assumption is called the *proportional odds* or the *parallel regression* assumption. By using the *Brant* test (Williams, 2006) I check, both for initial and alternative clustering, the parallel regression assumption to verify whether the parallel-line models are satisfied. If any of the test statistics are significant, this evidences the violation of the assumption and indicates that the ordered logit model may not be an appropriate specification to model reporting behavior. The results of the Brant test are reported in Table 12.

	<i>Initial clustering</i>	<i>Alternative clustering</i>
Variables	Brant test p>chi2	Brant test p>chi2
μ^{Eff}	0.364	0.800
μ^{Kno}	0.934	0.947
μ^{Glo}	0.008**	0.009**

**p≤0.05, *p≤0.10

Table 12 Brant test of parallel regression assumption for initial and alternative clustering

Looks at the significance of the results in Table 12, both the Brant tests for the initial and alternative clustering suggest that just the variable μ^{Glo} is problematic with regards to the parallel regression assumption, since it has a significant test, whereas the other two variables μ^{Eff} and μ^{Kno} do not appear to violate the assumption.

Therefore, I would need different models to describe the relationship between each pair of outcome groups. A solution could be use a non-ordinal model such as the multinomial logistic regression, but in this case I lost important information due to the ordinal nature of the dependent variable. Another alternative (Fu, 1998) in which the parallel-lines assumption is not violated and the ordinal information are supported is the *Generalized Ordered Logit* (GOLM). GOLM can fit models that are less restrictive than ordered logit model, whose assumptions are often violated how in this case, but they are more interpretable than non-ordinal method, such as multinomial logistic regression (Williams, 2006). More specifically, since in this model just one variable does not meet the parallel regression assumption I apply a *partial* proportional odds model, estimated by a GOLM regression, in which some variables meet the assumption while others do not. The results are organized in Table 13 for the initial clustering and in Table 14 for the alternative clustering. A detailed appraisal of

hypothesis H2a and H2b, according to the empirical findings of Table 13 and 14 is discussed in the next section.

Variables	Coefficients	<i>Model 1</i>		<i>Model 2</i>		
		Standard Error	Significant level	Coefficients	Standard Error	Significant level
μ^{Eff}	-2.52	1.69	0.13	-2.52	1.69	0.13
μ^{Kno}	6.95	1.55	0.00	6.95	1.55	0.00
μ^{Glo}	7.44	1.50	0.00	3.26	1.25	0.00
Log likelihood	-55.94					
Likelihood ratio χ^2	69.25					
Pseudo R ²	0.382					
<i>n</i>	83					

Table 13 Generalized ordered logit results for initial clustering

Variables	Coefficients	<i>Model 1</i>		<i>Model 2</i>		
		Standard Error	Significant level	Coefficients	Standard Error	Significant level
μ^{Eff}	-2.54	1.71	0.13	-2.54	1.71	0.13
μ^{Kno}	6.05	1.32	0.00	6.05	1.32	0.00
μ^{Glo}	7.39	1.50	0.00	3.24	0.96	0.00
Log likelihood	-55.83					
Likelihood ratio χ^2	69.47					
Pseudo R ²	0.385					
<i>n</i>	83					

Table 14 Generalized ordered logit results for alternative clustering

5.6.1 Appraisal hypothesis 2 set: results and discussions

The GOLM allows explanatory variables to having different effects on each category. Indeed, the model estimates a set of coefficients for each $m-1$ category at which the dependent variable can be dichotomized becoming equivalent to a series of binary logistic regression in which categories are combined. Specifically, in this case the categories are numbered 1, 2 and 3. The first panel of coefficients (*Model 1*) can be interpreted as those from a binary logit regression where the dependent variable is recoded as 1 (Outsourcing) vs. 2 and 3 (Alliance/partnership and M&A). The second panel of coefficients (*Model 2*) can be interpreted as those from a binary logit regression where the dependent variable is recoded as 1 and 2 (Outsourcing and Alliance/partnership) vs. 3 (M&A).

Through the partial proportional odds model, estimated by a generalized ordered logit regression, the interpretation of μ^{Eff} and μ^{Kno} variables that meet the parallel lines

assumption is easily interpretable since it follows the same interpretation as in an ordered logit regression. From Table 13 and 14, the coefficient of μ^{Eff} is negative as expected but not significant. Whereas, the coefficient of μ^{Kno} is positive as expected and is highly significant. This means that more an inter-firm relationship is Knowledge oriented, i.e. a high value of μ^{Kno} , more the governance form is oriented towards a hierarchical form, i.e. a high value of Y_j .

Regarding the variable μ^{Glo} is necessary to examine the pattern of coefficients through the two models. The coefficients of μ^{Glo} are consistently positive and significant just in the first model in both regressions. Positive coefficients mean that high values on μ^{Glo} make higher values on the dependent variable Y_j more likely, as hypothesized in H2b. I would expect that in Model 2, in which Alliance/partnership and outsourcing are put together and compared to M&A, the coefficients of μ^{Glo} decrease remaining significant. Whereas, even if the coefficients decrease when moving from alliance/partnership and M&A together (Model 1) toward M&A alone (Model 2), they are not significant, meaning that the ordering scale hypothesized in H2b cannot be confirmed by the data. Thus, M&A does not support those agreements that have a high value of μ^{Glo} , that is M&A and Alliance/partnership are used in the same way to fulfill a strategic need of globalization.

Summarizing, the analysis verifies how the foreseen linkages between governance forms and clusters of strategic needs are confirmed. It should be notice how H2b is fully confirmed by results of Table 13 and 14 since the β coefficients are, for both Knowledge and Globalization clusters, highly positive and significant in both the regression analysis conducted. As far H2a is concerned, the hypothesis cannot be confirmed since the β coefficients, even if negative as expected in both results, are not significant.

Thus, also by using primary data from a survey of Italian machine tool builders, I proved, with exception of the Efficiency cluster, that each strategic need is essentially achieved by a particular typology of alliance. Findings from regression analysis allow concluding that the motivation to achieve a global strategy and the need to compensate for some absences or weaknesses in assets or competencies are strongly related with governance forms.

5.7 Discussion

This chapter contextualizes the general framework, developed in Chapter 3 and empirically validated through a secondary data analysis in Chapter 4, by using primary data from an industrial manufacturing sector. That is, I conduct a confirmatory analysis to validate the results obtained with the previous analysis by applying the same approach in the Italian machine tool sector.

The empirical analysis in the MT industry, confirms how the conceptual framework, operationalized through hypotheses H1 and H2a and H2b, is substantially supported also in this research context. The main finding from the appraisal of the first hypothesis is that machine tool builders enter into strategic alliances with complex and multiple inter-firm objectives. As already occurred in the secondary data analysis, also by using primary data of a specific industrial settings, it is proved that firms want to realize a complex mixture of objectives from strategic alliances, and those mix of objectives are means for pursuing three basic strategic needs: improving efficiency/effectiveness, acquiring knowledge, and foster globalization. Indeed, this is basically confirmed by the high internal correlation of the inter-firm objectives characterizing each cluster, compared with the low external correlation. Moreover, this results lead to the same theoretical explanations made in Chapter 4.

The main finding from the appraisal of the second hypothesis is that exists a linkage between governance forms and cluster of strategic needs. Indeed, as already demonstrated in Chapter 4, I proved that the two strategic needs are achieved by a particular typology of alliance such as alliance/partnership, joint venture and merger and acquisitions, while it was not possible to confirm that efficiency based relationship are essentially obtained through outsourcing agreements.

Through the further investigation of this conceptual approach in a different industry in the next chapter I would like to understand how inter-firm objective' position in clusters differs depending on specific industries. Thus, a detailed evaluation and a deeply comparison of clusters' composition, according to the empirical findings of Chapter 4, 5 and 6 is discussed in the final chapter.

Chapter 6

STRATEGIC NEED PERSPECTIVE TO INTER-FIRM RELATIONSHIPS: A CONFIRMATIVE ANALYSIS IN THE ITALIAN BIOTECHNOLOGY AND PHARMACEUTICAL INDUSTRY

6.1 Introduction

Over the last 30 years inter-firm relationships have evolved into a strategic tool with which biotechnology and pharmaceutical companies effectively exploit and share technologies and products. In this industry, strategic alliances such as biotech/biotech, pharma/biotech, pharma/pharma, and drug delivery have increased both in number and value (Roijsackers and Hagedoorn, 2006). Recent researches in the field showed how the potential benefits provided by building long-term cooperative relationships with suppliers, competitors and partners are the right answer to an increasingly competitive environment (McCutchen and Swamidass, 2004). Indeed, today's biotech and pharma companies compete in an environment characterized by an intensified competition resulting from market saturation, increasing demand for shortest product life cycle and increasing technological innovation requirements. Moreover, these companies are faced with globalisation issues, through international mergers or acquisitions and establishing global sales programs for their products. These facts have dramatically influences the way of strategizing of biotechnology and pharmaceutical companies; to meet the requirements of today's market the rate of formation of strategic alliances has increased significantly over the last two decades (Hagedoorn, 2002).

The main purpose of this chapter is to contextualize the conceptual framework, already validated through the secondary data analysis in Chapter 4 and the empirical survey in Chapter 5, by using primary data from another Italian industrial manufacturing sector, the biotechnology and pharmaceutical. I would like to validate the results obtained with the previous two analyses by applying the same approach in the Italian bio/pharma industry to enhance both the validity and reliability of the research and to understand if the industry matters. For this second empirical survey, I choose bio/pharma context since strategic alliances are becoming increasingly important in this sector so, I argue that this industry might be another good test-based

for the conceptual model. Taking a closer look at the biotech and pharma industry, I would like to demonstrate that through collaboration agreements these companies develop their key competencies and strategies to compete effectively improving flexibility and quality, stimulating innovation, reducing lead times, and reaching new foreign market while simultaneously keeping costs down.

The following section presents a brief outlook on the bio-pharma industry. Section three motivates and supports the theoretical approach in the specific industry. Methodology and empirical investigations are summarized in section four and five. Finally, interpretations of the empirical investigation, building on the results of the research, are reserved for the last section.

6.2 Research context: the Biotechnology and Pharmaceutical industry

There is no doubt that the biotechnology and pharmaceutical industry is facing challenging times. The industry is under unprecedented pressure caused by the rising of R&D costs, tougher stance of regulatory demands while patent expiries and healthcare cost-containment policies decrease revenues. The issues involved to these challenges are very complex and cover a wide variety of areas including R&D, commercial, political and geographical to name a few.

The expiry of patents on blockbuster drugs, and the subsequent decline in revenues generated by original brands, is undoubtedly the major factor behind recent poor sales. Pfizer, for example, faced a big challenge in 2009, since *Lipitor*, world's best-selling pharmaceutical brand, with 2008 sales of \$12.4bn (Ernst & Young's report, 2009), was exposed to generic competition for the first time. Almost all the big pharma companies are exposure to patent expiries during the next five years. Increasing the competition among producers when patents no longer protect drugs, leads to significant price reduction of generic medicines. New competitors have to sustain fewer costs in creating the generic drug, since the Big Pharma have already sustained the higher costs of research, development and trial. The costs of these generic drugs are so low that many developing countries, such as Thailand, China, India and so on, can easily afford them, entering in competition with Western companies.

Moreover, while the expiry of patents on major blockbuster brands is a key factor of competition growth, bio/pharma cost-containment policies employed by governments or third-party have also played an important role. And, while revenues generated by

established blockbuster products are under growing pressure, costs associated with research, development and commercialization of new drugs and molecules continue to rise. Furthermore, since the most common and “easy” disease targets are already reached, covering the gaps in the healthcare market requires more complex drugs that are more expensive and take longer to develop, considering also the limited period of commercial exclusivity.

Finally, although the innovation process in bio/pharma industry is similar with that in other high-tech sector, it is shown that each 100 research projects only one drug reach the final market (Moran, 2007). Therefore, the fulfillment of the early-stage pipeline is another important issue that companies are coping with.

Most of the industry's leading players are already pursuing strategies designed to cope with this new challenging environments by implementing measures designed to make existing businesses leaner and fitter. Their primary efforts are strength pipelines cutting the overall costs, rationalizing the existing business and improving levels of efficiency; increase levels of investment in developing countries looking beyond traditional core markets; maintain high level of technological innovation in their R&D activities. To reach these objectives companies turn to strategic collaborative agreements in order to facilitate drug development, to lower the cost and risk of launching innovative drugs on their own and expanding their market boundaries. As it is possible to notice, this basically means that companies create strategic alliances to satisfy the three strategic needs described in Chapter 3.

The bio/pharma industry is a knowledge-intensive industry, since the whole value chain is built on knowledge and technology transfer. Under a regime of rapid technological development, research discovery are so broadly distributed that a single firm can hardly have all the internal capabilities and knowledge required for success in innovation. In this industry where the knowledge base is both complex and expanding and the sources of expertise are widely dispersed and tacit, the innovation can be found in networks of learning, rather than in individual firms. For example, Roche signed an agreement with strategic partner Genentech, a leading biotechnology company that allows Roche to exploiting the historical competences and knowledge in the field of cancer research of biotech partner to strengthen the focus on innovation and accelerate the search for new solutions for unmet medical needs (Roche, 2009). GlaxoSmithKline Inc. for example, has signed research alliance with organizations such as Cellzome and the Harvard Stem Cell Institute to strengthen their early-stage of

R&D. By exploiting the competences and know-how of academia structures GSK added significant breadth and scale to its R&D activities (GlaxoSmithKline Inc., 2008). Therefore, following such considerations there is a strategic need of *knowledge and learning* to innovate in this industry.

However, the industry is not characterized only by continuous innovation needs. Indeed, both competition from generics and pricing pressures in the healthcare market create pressures to reduce costs in all parts of the bio/pharma value chain. According to the data from the Centre for Medicines Research International, while both the averages of global R&D expenditure and development time increased, the number of new drugs that successfully reached the market is declining year by year (Harris, 2009). In these circumstances, the in-house R&D of the bio/pharma companies is no longer efficient or productive enough to full up their pipelines. In other words, bio/pharma companies need the external R&D resources to enhance their competitiveness. Example of this is the agreement between Pfizer and Wyeth (Press Release, 2009). Among the several aims of this strategic cooperation the principal is to create a lower, more flexible cost base able to create world's premier biopharmaceutical company characterized by diversification, flexibility, and scale positions in a dynamic global health care environment. Another case is Merck's recent merger with its customer Schering Plough (Merck, 2009), a move aimed at reducing the development time enhancing pipeline synergies. Therefore, considering such perspective, the bio/pharma companies have to accomplish an *efficiency and effectiveness* strategic need to improve the competitiveness of the industry and reach an advantage.

Finally, the industry is not characterized only by cost-cutting needs; indeed, companies are also looking to move into several high-growth areas and abroad geographical markets. Global expansion remains high on the agenda of these companies: branded pharmaceutical firms are expanding their presence in emerging markets to exploit the higher rate of growth of these countries compared to traditional markets. In May 2002 Novartis announced to move its research units to Cambridge, Massachusetts. Company's decision to invest in US is motivated by the concentration of the life science expertise in the Boston area, such as the university and hospital researchers who are the key producers of potentially commercializable intellectual property and the rapidly growing biotech companies as potential partners in collaborative developments (Dyer, 2002). Another example is the partnerships with

foreign partners of companies like AstraZeneca and GlaxoSmithKline (The Times, 2009) that have focused on the emerging markets such as China and India respectively, as largely unexploited potential 's focus on. Such considerations express a *global market access* strategic need that can be accomplished by making IFRs with local partners, who have a deeper knowledge of customers and foreign manufacturing markets, allowing to face coordination issues with final customers.

Summing up, it is possible to notice how all the challenges that the bio/pharma industry are facing with lead up to a necessity to fulfill one of the three strategic needs explained in the previous chapters. So, like MT industry also bio-pharma is a very interesting test-bed for analysing the creation of strategic alliances.

6.3 Contextualizing the theoretical framework in the Biotechnology and Pharmaceutical industry

As already done for the MT industry survey in Chapter 5, in the following two subsections I contextualize the general conceptual framework taking into consideration the specific features of another Italian manufacturing sector, the bio/pharma industry. Specifically, considering the explanations made here in section two, I modify the composition of previous clusters including or eliminating specific inter-firm objectives. Therefore, compared with the general framework of Chapter 3 and the validating model of Chapter 5, here the clusters are always composed from a mixed portfolio of inter-firm objectives but this mix is once again different.

6.3.1 Contextualizing hypothesis 1

As already explained in section two, also in bio/pharma industry strategic alliances can enhance efficiency and effectiveness of a company basically by focusing on a set of specific inter-firm objectives mainly concerning cost, time, quality and financial risk reduction (Gulati, 1998).

I have already described in previous chapters as strategic alliances can enable partners to lower costs by taking advantage of *long-term economies* such as scale, scope, and/or experience effects (Contractor and Lorange, 1988; Varadarajan and Cunningham, 1995; Alvarez and Barney, 2001). Scale and scope economies in R&D are important determinants of the pharmaceutical industry performance (Cockburn and Henderson, 2006). Creating strategic cooperation confers three principal

advantages in performing R&D in bio/pharma industry. First of all, strategic alliances may be able to spread the fixed costs of research over a larger sales base. Second, alliances may have advantages in the financial markets. Lastly, strategic alliance may be able to exploit economies of scale and scope in the conduct of research itself. Indeed, one of the principal objectives of an R&D alliance is create larger laboratories in which is possible to buy more specialized equipment, so that experimental activities will be more effective. These considerations are consistent with the notion that bio/pharma R&D programs require increasing economies of scale (Cockburn and Henderson, 1996). For small and medium firms to improve the productivity of their research programs, they can engage in R&D acquisitions or alliances to increase their scale.

Labour cost reduction has been observed as an inter-firm objective in strategic alliances (Sia and Bruton, 2005). As in other manufacturing industries, like MT sector, also in bio/pharma industry low currency values in Eastern Europe, India and China both with local talent pools and broad usage of English language have created a supply of low-cost labor that is increasingly being used by Western companies to contain their costs in order to compete more effectively. Thus, a rising number of outsourcing and alliances are created with Eastern Europe, India and China companies to take advantages of low labor costs. To reduce the impact of labour costs, companies tend to use flexible automation systems, able to produce several numbers of products, and to transfer toward lower cost developing countries their low-technological activities creating agreements with local producers (Houston et al., 2001). Unlike drug discovery that is technology-intensive and requires specialized equipment and expertise, bio/pharma companies usually outsource clinical testing activities which are labor-intensive and involve large numbers of human capital and clinical study administrators.

Quality improvements, both in product and process, provide additional advantages to accomplish the strategic need of efficiency and effectiveness. Therefore, another important reason for forming strategic alliances is to outsource business areas, like marketing, production, accounting, sales, or virtually any other process, to a company which can do it better and cheaper. In bio/pharma industry researchers have highlighted as, improved quality was a primary formation motive for material supplier alliances (Hoffmann and Schlosser, 2001). Indeed, especially leading pharmaceutical companies have realized that their suppliers often have critical expertise that, if

included in the development or in the manufacturing process, can improve the final product and the way to produce it in terms of quality (Liker and Choi, 2006). Integrating and involving strategic suppliers earlier in the design and development process is one of the approaches to gain competitive advantage for companies which are facing global competition and markets that demand for innovative and higher quality (Demmy and Petrini, 1992). Thus, closer relationships between manufacturers, together with their material, logistic and service suppliers offer significant opportunities to create strategic advantage and achieve improved performance and efficiency. For these reasons several large pharmaceutical companies outsource not just routine commodity-like operations, but parts of their internal value chain considered core competence to the organization (Elmuti and Kathawala, 2001).

Finally risk sharing or risk reduction has been proposed in several studies (Kogut, 1988; Hagedoorn, 1993; Wheelen and Hungar, 2000) as important justifications for joining strategic alliances. For instance, many researchers identified risk control and risk reduction in R&D as a key rationale for R&D-related alliances. This is especially true in those strategic alliances realized to share and reduce risks associated to new development observed in the bio/pharma industry. The R&D costs associated to the development of new drugs are usually really huge as well as the critical risks (Chu et al., 2010). There is no guarantee that at the end a new drug can be found and commercialized and, even if such drug is successfully developed, there is no guarantee that the company is the first one in the industry to achieve the result. All these reasons make sense to involve other companies in research project through a collaborative agreement since sharing risk increases both the chances of success, and the economic benefits that successful new products bring (Das and Teng, 1998).

After the analysis of two different datasets, secondary and primary, it is already recognized how acquiring of new knowledge and developing of organizational learning are also primary reasons why firms establish alliances. This is especially true in bio/pharma industry (Powell, 1998). The need of knowledge and learning can be fulfilled through strategic alliances by pursuing the following set of inter-firm objectives (Inkpen, 1998): developing new capabilities and skills, sharing and pooling complementary assets, reducing new product development time and developing innovative products and new process technologies.

From the most influential literature of strategic alliance formation, RBV theory and Relational view (see Chapter 2 for an extended review), the wish of firms to obtain access to *complementary assets* owned by other companies has been considered a key motive for forming alliance (Penrose, 1959; Wernerfelt, 1984; Kogut, 1988; Das and Teng, 2000; Gulati et al., 2000; Kale et al., 2000; Grant and Baden Fuller, 2004). More competencies are complementary, more allied parties should be able to take advantage of each other. This is related to the fact that firm is a collection of heterogeneous, valuable, rare and difficult to imitate resources and strategic alliances give companies the possibility to pool resources to learn each other. Thus, the access to complementary techniques and know-how makes able companies to learn the partners' specialized capabilities taking advantages from this reciprocal learning. A consistent number of scholars (Rothaermel, 2001a; 2001b) showed how alliances in the bio/pharma industry seem to be driven by a search for mutually complementary assets. Indeed, in industries that exhibit rapid change in the technological environment, such as bio/pharma, companies rarely possess all assets and capabilities to compete in all business areas (Doz & Hamel, 1997). Thus, in these sectors alliances can be a way to combine for instance new technology with the existing market access of a firm. This is especially true for the biotechnology companies that generally lack the specialized complementary assets, such as for example manufacturing capacity, brand, sales force, distribution channels or customer care capabilities that are needed to exploit commercially their innovative thoughts. Due to the lack of sufficient funding and time they are not able to internally develop these complementary assets; so, especially smaller companies prefer to specialize in R&D activities by obtaining the access to those assets through strategic IFRs with leading pharmaceutical companies (Gomes-Casseres, 1997; Carpenter and Petersen, 2002a, 2002b).

In an era of rapid and changing technological advances a firm's survival and growth depends on its ability to introduce new products to the market. Such question became particularly important in high technology industry such as biotech and pharma industry. Indeed, especially in the drug discovering and developing a lot of firms experience intensive pressure developing drugs faster and cheaper. In this specific industry, company's competitive survival is based on firm's ability to rapidly develop new products and bring them to market to gain early cash flows, external visibility and early market share (Deeds and Hill, 1996). Firms can no longer rely on the internal technological competence and market knowledge in developing and bringing products

to the market in the shorter time (Teece, 2000). Deeds and Hill (Deeds and Hill, 1996) argue that forming strategic alliances allows to access to complimentary assets needed in the new product development process decreasing a firm's rate of new product development time. This is quite reasonable because in order to develop a new product a number of complementary assets have to be integrated, and strategic alliances are an effective way of quickly assembling the required set of complementary assets. Therefore, *reducing new product development time* creating strategic collaborations allows at satisfying a strategic need of knowledge and learning.

The learning motivation for engaging in alliances and *new knowledge acquisition* have been a growing theme in alliance literature, particularly with respect to technology-based industry (Contractor and Lorange, 1988; Hamel, 1991; Dunning and Gugler, 1993; Doz and Hamel, 1997; Inkpen, 1998). As explained in the previous section, being the bio/pharma sector a knowledge-base industry, certainly a key critical factor in the development of the industry is the continuous acquisition of new external knowledge and the re-building of the internal knowledge base via cooperation such as in R&D alliances (Bierly and Chakrabarti, 1996). In this industry strategic alliances not only promote the interaction and learning between firms, universities and research institutions, but also internalize external know-how and knowledge and activate the firm's internal resources (Forrest and Martin, 1992; Sheen, 1992; Teece, 1992). In bio/pharma literature on strategic alliances, scholars define downstream alliances, that is alliances with pharmaceutical, chemical and marketing firms, and upstream alliances, that is alliances with universities, research institutes, government labs, hospitals and industry associations. Alliances with downstream partners might provide access to complementary knowledge critical to fruitful development and commercialization: knowledge of the final market, marketing and distribution skills, and know-how in managing clinical trials (Pisano, 1990). Also alliances with upstream partners might be a source of new knowledge critical to succeed especially in patent races (Liebeskind et al., 1996). The interaction opportunities create within such alliances might generate new ideas and incentive the sharing of experience necessary for interorganizational learning (Powell et al., 1996). This is particularly true in collaboration agreements with universities, research institutes, and government labs.

Prior researches provide evidences that firm's strategic alliances have a positive impact on its innovativeness (Shan et al., 1994), especially in a high-technology

industry such as bio/pharma industry characterized by rapid and continuous changes. Indeed, to remain competitive in a marketplace characterized by rapid changes, companies must be able to adapt quickly by *innovating their products, processes or services*. Greis et al., in their work (Greis et al., 1995) build a conceptual framework to illustrate the motives of strategic alliances in the bio/pharma industry. According to their suggestions one of the most important motivation for allying is company's need to secure the complementary knowledge necessary to support the innovation activities of the firm. This is quite reasonable since strategic alliances might be considered as a vehicle to obtain strategic assets, such as knowledge and skill, necessary to develop and commercialize new drugs that are not currently held in the internal asset portfolio. For example, many of the R&D alliances between pharmaceutical and biotechnology firms are structured so that the pharma firm, in exchange for funding a research project, acquires the right to observe its biotech partner in the development process of a new drug or molecule, acquiring new external knowledge while innovating.

I have previously demonstrated as motives for formation of strategic alliances extend beyond pure financial and knowledge/learning objectives, to encompass also the creation of new market opportunities (Varadarajan and Cunningham, 1995; Hitt et al., 2001). Strategic alliances whose primary purpose is to fulfil the need to globalize the market are focused on a set of specific inter-firm objectives mainly concerning new market penetration, and increasing market share.

In literature is well recognized that strategic alliances are effective strategies to overcome the skills and resource gaps encountered in gaining access to *new markets*. Reviewing many strategic alliances is demonstrated that these agreements strongly support companies for facilitating entry into foreign markets and increase market presences (Collins and Doorley, 1991; Lei and Slocu, 1991). This phenomenon is evident also in bio/pharma context, where the increasing international competition forces them to pursue international strategies including international strategic alliances. The reason behind the formation of alliances among bio/pharma firms and foreign partners is to secure fast and reliable access to the new market or to previously closed markets utilizing partners' distribution expertise and established network. Thus, they build international inter-firm partnerships as international source of R&D, source of political regulations and regulatory barriers to entry, and knowledge of local distribution channels and advertising agencies. Therefore, many firms seek to exploit

the opportunities of new markets by building links with local partners in order to gain global market access (Buckley, 1992).

Finally, firms can improve the access to new markets and strengthen their competitive success by securing stronger positions through consolidation of firm's existing *market share* (Buckley, 1992; Eisenhardt and Schoonhoven, 1996; Barringer and Harrison, 2000; Das and Teng, 2000). Bio/pharma companies in order to protect their competitive position in the domestic market make strategic alliances that allow them to access new global markets. At the same time these agreements improve their existing market share and lay the foundation for future alliances with the same partners in foreign markets (Greis et al., 1995; McCutchen and Swamidass, 2004). Significant examples of this are the most recent M&A agreements between Pfizer and Wyeth, Merck and Schering-Plough and Roche and Genentech, in which the main objectives was improve their existing market share diversifying their business into new technologies, therapy areas and markets (Datamonitor, 2009). Specifically, over the past ten years, Pfizer has entered into three transformational M&A agreements that have almost double its pharmaceutical market share from 4.5% to 8.4% becoming a global company in the healthcare market.

As already done in the previous chapters, following the above discussion I located 12 inter-firm objectives listed in Table 15. The literature analysis on biotech and pharma strategic alliances suggests how inter-firm objectives from A to E are mainly related with *efficiency/effectiveness needs*, i.e. such inter-firm objectives are a mean to pursue efficiency/effectiveness. On the other hand, objectives from F to J are mainly related to *knowledge/learning needs* and, finally, objectives K and L are mainly concerned to *global market access needs*.

Code	Inter-firm objectives
A	Long term economies
B	Reducing labour cost
C	Improving product quality
D	Improving process quality
E	Reducing risk
F	Sharing complementary assets
G	Reducing new product development time
H	Acquiring and developing new knowledge
I	Developing innovative product
J	Developing innovative production process
K	Entering and developing new markets
L	Improving market share

Table 15 Inter-firm objectives in bio/pharma industry

As explained for the general framework, and for the confirmative analysis in the MT industry, also here bio/pharma managers basically pursue strategic needs when they sign strategic alliances. Therefore, also in this industry inter-firm objectives that contribute to obtain the same strategic need are pursued in strong correlation each other that is manager pursues them in cluster when they make inter-firm agreements. I continue to call these clusters according to the three strategic needs: *Efficiency*, *Knowledge* and *Globalization*. Clusters are characterised by a strong internal correlation among the objectives and weak external correlation among objectives of different clusters. According to these reasonings the following hypothesis can be stated:

Hypothesis 1: *Inter-firm objectives can be grouped in the following clusters: (a) Efficiency cluster consisting of objectives from A to E; (b) Knowledge cluster consisting of objectives from F to I; (c) Globalisation cluster consisting of objectives K and L.*

6.3.2 Contextualizing hypothesis 2 set

As for the hypothesis 2 set in generic conceptual framework and in the MT context, in this section I would like to proof that, also in the bio/pharma industry the three strategic needs are achieved by a particular typology of alliance such as outsourcing, alliance, partnership, joint venture and merger and acquisition.

Since I have already motivated the theoretical explanations that lead to ranking strategic alliances on a continuum between contractual market agreements, i.e. the

market, and complete internalization, i.e. the *hierarchy*, the following hypotheses can be stated:

Hypothesis 2a: *When the main strategic need is to gain efficiency/effectiveness, IFR governance forms are market oriented and therefore closer, in decreasing order, to outsourcing and non-equity alliances.*

Hypothesis 2b: *When the main strategic need is either to gain knowledge/learning or to globalize, IFR governance forms are more hierarchy oriented and therefore closer, in decreasing order, to merger and acquisition, joint ventures and alliances/partnerships.*

6.4 Characteristics of the sample and data collection

The data utilized in this study come from an emailed survey of Italian biotechnology and pharmaceutical firms engaged in strategic alliances. The survey has been carried out in collaboration with Farindustria, the Italian Association of Biotechnology and Pharmaceutical companies. Farindustria initially contacted 200 associated companies, but only 52 expressed their willingness to participate. Over the 52 questionnaires delivered 39 are returned, and within this sample, are collected a total of 154 agreements: 53 alliances/partnerships; 7 joint ventures; 38 mergers and acquisitions; and, 56 outsourcing.

Since a consistent number of bio/pharma companies in the sample failed to respond I controlled if there is a difference between respondents and non-respondents evaluating non-response bias (Armstrong and Overton, 1977). Comparing the respondents with the non-respondents on company sales volume and number of employees, and comparing the early and late respondents on the model variables, that is the inter-firm objectives (Armstrong and Overton, 1977), the *t*-tests showed no significant differences, suggesting that also in this case response bias is not a significant problem in this study.

Also in this survey a theory-testing questionnaire is designed. The questionnaire, reported in Appendix, is pre-tested through in-depth interviews with executives. After having interviewed respondents and discussed with them the objectives of the study, I used their suggestions to complete the questionnaire. Also in this survey, I assured

that every section of the questionnaire is addressed by the person in the company having the right knowledge to properly respond to the questions.

The test of the hypotheses requires that the respondent, through the questionnaire, is able to assign values to specific variables. Therefore, I included in the questionnaire questions associated to the variables object of this study.

I adapted the same questionnaire submitted to MT industry companies at bio/pharma sector. Therefore, in the first section of the questionnaire I asked each company to list the inter-firm agreements addressed in the last ten years. Also in this survey, inter-firm agreements are grouped in: outsourcing, alliances, joint ventures and merger and acquisition. In order to address hypothesis 1, for each inter-firm agreement mentioned by the company, I asked the respondent manager to assess how important is each one of the strategic objective listed in Table 15 for pursuing the strategic needs. In order to do that, I used multiple-item Likert scale. For assessing the set of hypotheses 2 I have associated to each inter-firm agreement typology the list of strategic objective importance.

6.5 Empirical Analysis: testing hypothesis 1

As already stated, I collected 39 questionnaire containing 154 agreements that are the unit of analysis. Let indicate with j the agreement index, $j = 1, \dots, 154$ and with $i = 1, \dots, 12$ the inter-firm objectives index. Let also indicate with v_{ij} the importance of the i^{th} inter-firm objective in the j^{th} agreement. First of all descriptive statistics have been provided for the inter-firm objectives. Table 16 reports the mean, the standard deviation, the minimum and the maximum for each inter-firm objective i .

Variables	Obs	Mean	Std. Dev.	Min	Maz
A	154	1.720	1.340	1	5
B	154	1.311	0.859	1	5
C	154	1.616	1.103	1	5
D	154	1.525	1.049	1	5
E	154	1.675	1.193	1	5
F	154	2.558	1.699	1	5
G	154	1.967	1.514	1	5
H	154	2.240	1.525	1	5
I	154	1.733	1.313	1	5
J	154	1.422	0.927	1	5
K	154	1.844	1.486	1	5
L	154	2.779	1.819	1	5

Table 16 Descriptive statistics of bio/pharma industry data

In order to test hypothesis 1, as already done in Chapter 4 and 5, I developed a modified version of the classical *k-means algorithm*. Since the model and the resolutions are the same I refer to Chapter 4 for the explanation of *k-means* clustering analysis, reporting here just the results. Table 17 reports the results of the clustering with performance indexes.

Clusters	Objectives	RWit	RBet	Objective function
Eff	A, B	2.50	Eff, Kno	0.205
Kno	C, D, F, G, H, I, J	15.822	Eff, Glo	-0.440
Glo	E, K, L	4.680	Kno, Glo	0.150
		23.00		23.087
			-0.085	

Table 17 Cluster results

The *k-means* algorithm works appropriately. The solution obtained provides a total internal correlation among the objectives within the cluster, $RWit = 23.0$; this is the sum of an internal correlation within the 3 clusters as depicted in the column *RWit* of Table 17. On the other hand, the total correlation among the clusters is $RBet = -0.085$; this result is given by the sum of a correlation between the clusters in pairs as depicted in column *RBet* in Table 17. Also in this case, the reader should know how the total internal correlation among the three clusters is greater than the total correlation within the Pearson matrix containing all the 12 inter-firm objectives. This reveals a good separation of the three clusters detected. Moreover, the *k-means* algorithm is tested with just two clusters activated for all the datasets. By running the algorithm in this

way, the optimal value of the objective function is lower than the one reported in Table 17. This means that optimal clusters with $c = 2$ have a lower internal correlation and a higher external correlation than clusters with $c = 3$; therefore, as hypothesized, $c = 3$ is a better clustering for the objectives than $c = 2$.

By analyzing the clustering results in Table 17 it is possible to conclude that:

- *Efficiency/effectiveness* cluster consists of the inter-firm objectives A and B;
- *Knowledge and learning* cluster consists of the following inter-firm objectives: C, D, F, G, H, I, J;
- *Global market access* cluster consists of the following inter-firm objectives: E, K, M.

6.5.1 Appraisal hypothesis 1: results and discussions

Table 17 reports the results of clustering analysis with performance indexes. As far as the Efficiency cluster is concerned, it is partially supported by the empirical findings. Indeed, differently to what stated in H1, empirical results put the inter-firm objectives C - *improving product quality* and D - *improving process quality* among the objectives of the Knowledge cluster and inter-firm objective E - *reducing risk*, among the objectives of the Globalization clusters. Whereas, as far as the objective of Knowledge and Globalization cluster, their hypothesized positions are fully supported by the empirical findings.

Summing up, cluster analysis results differ from hypothesis 1 for the position of inter-firm objectives C - *improving product quality*, D - *improving process quality*, and E - *reducing risk*. It is important to underline that all these objectives are hypothesized within Efficiency clusters. Reasonable explanations can be done for this different positioning.

In order to understand why C - *improving product quality* is grouped in the Knowledge cluster, it should be underlined how this objective has a correlation of 0.40 with the objective G - *reducing new product development time*, of 0.19 with H - *acquiring and developing new knowledge*, of 0.16 with I - *developing innovative production process*, and, of course, of 0.52 with D - *improving process quality*. From the above analysis it comes how the quality of pharmaceutical products essentially depends not from the manufacture characteristics, but on the technologies used to produce it. Therefore, product quality is more related with knowledge acquisition than

efficiency need. Indeed, to improve the quality of a pharmaceutical product, companies try to develop better knowledge and technologies able to improve its therapeutic capabilities. So, it is not surprising that C - *improving product quality* is grouped in the Knowledge cluster. Furthermore, this result is in accordance with the clustering obtained by the MT sample, and, partially with the result obtained in Chapter 4 from the secondary data analysis.

As far inter-firm objective D - *improving process quality* is concerned, it has a correlation value of 0.20 with B - *reducing labor cost*, i.e. and efficiency need objective, so that the position of D is essentially due to the position of its counterpart objective C - *improving product quality*.

E - *Risk reduction* has a positive correlation with F - *sharing complementary assets* (0.28), K - *entering and developing new markets* (0.22) and L - *improving market share* (0.25), while it has no significant correlation with efficiency inter-firm objectives. As I have already mentioned, the correlation between E and F is quite expected, because sharing complimentary assets allows reducing the risk. However, the empirical results reveal how, in the bio/pharma industry, the risk reduction is assumed closely related with the possibility to penetrate new markets, K, and improving market share, L. Indeed, globalization allows increasing the sales volume reducing the incidence of R&D cost and, therefore, reducing the risk due to sunk research and development costs.

Summing up, the different position of objectives C - *improving product quality*, D - *improving process quality*, and E - *reducing risk* might suggest how the belonging of inter-firm objectives to the three clusters is industry dependent. Indeed, for example, while quality improvement in most of the manufacturing industries is seen as a way to improve efficiency through scraps, recalls and warranty costs reduction, in the bio/pharma and MT industry, quality results more related to knowledge need. Considering the results of the three empirical analyses, and looking at the different positioning of several inter-firm objectives in one cluster rather than another one, a question arises: Does industry matter? The intuition is that the industrial context in which the alliances are embedded directly affects the inter-firm relationship formation. For example, the intensity of industry competition, or the specific product characteristics might influence whether firm decides to create an alliance to compete for greater market share, to cooperate with other firms for particular strategic advantages, or to internationalize by entering foreign markets. These reasonings are

discussed in the next chapter, in which is presented a deeply comparison of clusters' composition obtained through secondary analysis, and survey analysis.

6.6 Empirical Analysis: testing hypothesis 2 set

In order to test hypothesis set H2, governance forms have been grouped into three typologies:

- *Outsourcing (Out)*, within this typology I collected cases concerning outsourcing;
- *Alliances (All)*, this category represents cases of alliances and partnerships;
- *Merger and Acquisition (M&A)* and *Joint Venture (JV)*, M&A and JV have been grouped together because in the sample only 7 JVs are present, therefore, they are considered together with M&A agreements.

As previously discussed the above governance forms are located in a continuum between pure market transaction and hierarchy, outsourcing being the closest to the market and M&A the furthest. Therefore, an ordinal variable Y is associated to such governance forms; Y can vary from 1 to 3, being 1 the governance form closest to the market, i.e. *Out*, and 3 the furthest, i.e. *JV* and *M&A*.

Now, each agreement j involves just one governance typology; however, each agreement may involve different inter-firm objectives; therefore, a generic agreement j can be more or less involved with a specific cluster. Thus, as already defined in Chapter 5, I define a measure, as in (9), expressing the degree of membership of each agreement j to one of the three clusters previously defined, i.e. *Efficiency*, *Knowledge* and *Globalization*.

$$\mu_j^c = \frac{\sum_i v_{j,i} \cdot x_{i,c}}{5 \cdot N^c} \quad (9)$$

With $c = \text{Eff}, \text{Kno}$ and Glo and N^c being the number of inter-firm objectives characterizing the cluster c , that is $N^c = \{2, 7, 3\}$. The numerator of μ_j^c is the summation over all the objectives i which are present in the agreement j and belonging, at the same time, to the cluster c ; this sum is normalized by dividing for the maximum value the numerator can reach, that is given by the product of N^c times the maximum value each evaluation can reach, i.e. 5.

Now, by having indicated with Y_j the governance form associated to case j in order to test hypotheses set H2, I again assume a multiple regression model as in (10):

$$Y_j = \alpha_j + \beta^{Eff} \mu_j^{Eff} + \beta^{Kno} \mu_j^{Kno} + \beta^{Glo} \mu_j^{Glo} + \varepsilon_j \quad (10)$$

According to H2a I expect a negative value for β^{Eff} , since more an IFR is an *Efficiency* one, i.e. an increasing value of μ_j^{Eff} , more the governance form should be oriented towards the market, therefore a lower value of Y_j . From H2b I expect a positive value for β^{Kno} and β^{Glo} .

As in models presented in Chapter 4 and 5, the dependent variable has an ordinal scale and according to the considerations already done the appropriate model is the *ordered logit*.

Again, by using the *Brant* test (Williams, 2006) I check the parallel regression assumption to verify whether the parallel-line models are satisfied. If any of the test statistics are significant, this evidences the violation of the assumption and indicates that the ordered logit model may not be an appropriate specification to model reporting behavior. The results of the Brant test are reported in Table 18.

Variables	Brant test p>chi2
μ^{Eff}	0.795
μ^{Kno}	0.015**
μ^{Glo}	0.000**

**p≤0.05,*p≤0.10

Table 18 Brant test of parallel regression assumption

Looks at the significance of the results in Table 18, the Brant test suggests that just the variable μ^{Eff} does not appear to violate the assumption, whereas the other two variables μ^{Kno} and μ^{Glo} are problematic with regards to the parallel regression assumption, since they have a significant test.

Therefore, for the same reasons exposed in Chapter 5, I use *Generalized Ordered Logit* (GOLM). Specifically, since in this model two variables on three do not meet the parallel regression assumption I apply a *partial* proportional odds model, estimated by a GOLM regression, in which some variables meet the assumption while others do not. The results are organized in Table 19. A detailed appraisal of

hypothesis H2a and H2b, according to the empirical findings of Table 19 is discussed in the next section.

Variables	Coefficients	Model 1		Model 2		
		Standard Error	Significant level	Coefficients	Standard Error	Significant level
μ^{Eff}	-2.60	1.10	0.01	-2.60	1.10	0.01
μ^{Kno}	6.41	1.76	0.00	0.21	1.17	0.72
μ^{Glo}	7.06	1.34	0.00	0.29	0.82	0.64
Log likelihood	-135.43					
Likelihood ratio χ^2	36.71					
Pseudo R ²	0.196					
<i>n</i>	154					

Table 19 Generalized ordered logit results

6.6.1 Appraisal hypothesis 2 set: results and discussions

As already explained, the GOLM allows explanatory variables to having different effects on each category. See Chapter 5 for explanations. Through the partial proportional odds model, estimated by a generalized ordered logit regression, the interpretation of μ^{Eff} variable that meets the parallel lines assumption is easily interpretable since it follows the same interpretation as in an ordered logit regression. From Table 19, the coefficient of μ^{Eff} is negative as expected and is highly significant. Meaning that more an inter-firm relationship is Efficiency oriented, i.e. a high value of μ^{Eff} , more the governance form is oriented towards the market, i.e. a lower value of Y_j .

Regarding the variable μ^{Kno} and μ^{Glo} is necessary to examine the pattern of coefficients through the two models. The first panel of coefficients (*Model 1*) can be interpreted as those from a binary logit regression where the dependent variable is recoded as 1 (Outsourcing) vs. 2 and 3 (Alliance/partnership and M&A). The second panel of coefficients (*Model 2*) can be interpreted as those from a binary logit regression where the dependent variable is recoded as 1 and 2 (Outsourcing and Alliance/partnership) vs. 3 (M&A). The coefficients of μ^{Kno} and μ^{Glo} are consistently positive and significant just in the first model. Positive coefficients mean that high values on μ^{Kno} and μ^{Glo} make higher values on the dependent variable Y_j more likely, as hypothesized in H2b. That is, in Model 1 in which Alliance/partnership and M&A are put together and compared to outsourcing, Alliance/partnership and M&A support a knowledge and globalization need whereas outsourcing an efficiency need, as hypothesize in H2a.

Following the same reasoning I would expect that in Model 2, in which Alliance/partnership and outsourcing are put together and compared to M&A, the coefficients of μ^{Kno} and μ^{Glo} decrease remaining significant. Whereas, even if the coefficients decrease when moving from alliance/partnership and M&A together (Model 1) toward M&A alone (Model 2), they are not significant, meaning that the ordering scale hypothesized in H2b is not followed by the data. Thus, M&A does not support those agreements that have a high value of μ^{Kno} and more high value of μ^{Glo} , that is M&A and Alliance/partnership are used in the same way to fulfill a strategic need of and globalization.

Summarizing, also this analysis sanctions how the foreseen linkages between governance forms and clusters of strategic needs are confirmed. It should be notice how H2a is fully confirmed by results of Table 19 since the β coefficients are highly positive and significant. As far H2b is concerned, the hypothesis is not fully confirmed since the β coefficients are negative as expected and significant just in Model 1. Thus, also by using primary data from a survey of Italian Biotechnology and Pharmaceutical companies, as already done with MT industry, I again proved that each strategic need is achieved by a particular typology of alliance. The different results of primary analysis compared to secondary analysis on H2a might suggest how the foreseen linkages between governance form and clusters of strategic needs is industry dependent making arise again the question: Does industry matter? Once again, the intuition is that the industrial context in which the alliances are embedded directly affects the inter-firm relationship formation. These reasonings are discussed in the next chapter, in which is presented a deeply comparison of findings obtained through secondary analysis, and survey analysis.

6.7 Discussion

This chapter shows how the question of IFRs in an industry such as biotechnology and pharmaceutical is strategic for firm competitiveness. As reported in bio/pharma' company annual reports and in the recent literature on IFRs, the frequency of firms participating in inter-firm collaborations has increased dramatically over the last twenty years. Several companies, such as SmithKline/Beecham, Marion/Merrell, Bristol-Myers/Squibb, and Rhone-Poulec/Rorer, chose to create strategic alliances to gain control over distribution channels, expand market coverage of products, achieve

economies of scale, access capabilities that may be difficult to develop in-house, share R&D costs, and reduce the time of development of pipeline (Pisano, 1997).

This chapter contextualizes the conceptual framework, validated through a secondary data analysis in Chapter 4 and primary data analysis of Italian MT industry in Chapter 5, by using another set of primary data from a survey of Italian bio/pharma industry. That is, I conduct another confirmatory analysis, validating the results obtained with the previous analysis, by applying the same approach in the Italian bio/pharma industry.

The results of this empirical analysis once again confirm how the conceptual framework, operationalized through hypotheses H1 and H2a and H2b, is substantially confirmed. Also in this industry, bio/pharma companies enter into strategic alliances with a complex mixture of inter-firm objectives and those mix of objectives are meant for pursuing three basic strategic needs: improving efficiency/effectiveness, acquiring knowledge, foster globalization. These results lead to the same theoretical explanations made in Chapter 4 and 5.

The main finding from the appraisal of the second hypothesis is that exist a linkage between governance forms and clusters of strategic needs. Indeed, as already demonstrated in Chapter 4 and 5, I proved that also in bio/pharma industry the three strategic needs are achieved by a particular typology of alliance such as outsourcing, alliance/partnership, joint venture and merger and acquisitions. Therefore, a detailed evaluation and a deeply comparison of clusters' composition, according to the empirical findings of Chapter 4, 5 and 6 is discussed in the next chapter.

Chapter 7

DISCUSSIONS AND CONCLUSIONS

7.1 Introduction

This final chapter aims at drawing together the study and its main contributions. The findings and suggestions are critically reviewed and potential limitations of the study are highlighted.

The organization of the chapter is divided into six sections. This chapter begins with the summary and conclusions of the present study. Hence, the main theoretical contributions of this study are presented in section three. Section four and section five highlight the implications that respectively arise from the hypothesis 1 and hypothesis 2 set appraisal. Finally, the limitations of the study and suggestions for further research are outlined at the end of this chapter.

7.2 Summary and conclusions

Reviewing the most influential theoretical and empirical explanations on the process of strategic alliances formation it is notable that firms enter into strategic alliances for various reasons. Besides theoretical considerations, managers enter alliances to pursue several *inter-firm objectives* such as accruing market power, sharing risk and investment, building new competence and skills, entering new markets, enhancing innovativeness, developing new products, achieving economies of scale and scope, reducing cost and improving flexibility. The literature on motivation for alliance formation is rich, fragmented and produces an impressive list of reasons for why organizations enter into an alliance. The review of several theoretical explanations and conceptual models, has suggested that managers pursue different inter-firm objectives in alliances and that the formation of alliances depends on firms' strategic needs and organization's attributes.

Basically, the main purpose of this study was to show that managers enter alliances to basically satisfy three *strategic needs*: efficiency/effectiveness, knowledge and learning and global market access needs. Moreover, the operation management perspective to networks suggests an approach to IFRs that has never been investigated

by the strategic management literature. Indeed, strategic management scholars have never investigated whether inter-firm objectives, which managers pursue within alliances, are in some way related each other with a particular strategic need. This would implies that is possible to group inter-firm objectives into homogeneous clusters which are characterised by the achievement of a particular *strategic need*. Furthermore, if is possible to group inter-firm objectives into clusters each one characterised by a strategic needs, is also possible to hypothesize that the strategic need characterising the cluster is correlated with a particular alliance typology, so that each strategic need is pursued by a particular typology of alliances.

Therefore, through the conceptual framework defined in Chapter 3 two research questions were addressed:

- Is it possible to group specific inter-firm objectives in clusters characterised by a unique strategic need that managers want to fulfil through alliances?
- Are these clusters correlated with particular alliance typologies?

In Chapter 3, I critically reviewed the relevant literature concerning specific inter-firm objectives in alliances to design a conceptual framework that basically hypothesizes that three principal *strategic needs* provide a sounding explanations to understand why firms establish strategic alliances. Moreover, by reviewing the relevant literature concerning alliance typologies I have tried to hypothesize a link between a bunch of specific inter firm objectives characterised by a specific strategic need and a particular typology of alliance (outsourcing, alliances, joint-venture and so on).

In Chapter 4, I conducted an explorative analysis to test the hypotheses of conceptual framework by using secondary data sources. Thus, through an empirical test I proved that the previous three clusters exist, and that they are composed from a mixed portfolio of inter-firm objectives theoretically deducted from several theories. Moreover, I verified, through the empirical investigation about the hypothesis set H2, that governance structure choices in the process of strategic alliance formation are affect by the strategic need perspective.

Since the findings from the explorative analysis of Chapter 4 were subject to several limitations, such as the external validity and the generalizability of the results due to the use of secondary data, in Chapter 5 and 6 I have conducted a confirmatory analysis through a survey research methodology. In Chapter 5, I have validated the results obtained with the previous analysis by applying the same approach in the

Italian sectors of the machine tools. The empirical analysis in the machine tool industry, have substantially confirmed the conceptual framework, operationalized through hypotheses H1, H2a and H2b, also in this research context. Whereas, in Chapter 6, I have contextualized the conceptual framework by using another set of primary data from a survey of Italian biotechnology and pharmaceutical industry. This further confirmatory analysis has validated the results obtained with the previous analysis; the results again have confirmed that also in this industry, companies enter into strategic alliances with a complex mixture of inter-firm objectives and those mix of objectives are meant for pursuing three basic strategic needs and that exist a linkage between governance form and clusters of strategic needs.

7.3 Theoretical contribution to strategic alliance literature

The different areas in the strategic management field, reviewed in Chapter 2 and summarized in Table 1, have all made valuable contributions to the strategic alliance topic responding to the question “why firms established alliances?”. The findings from empirical investigations lead up to several theoretical contributions to this strand of literature.

First of all, observing the results of clustering analysis, I proved that three clusters exist, and that they are composed from a mixed portfolio of inter-firm objectives theoretically deduced from several theories. This finding demonstrates that even if each theoretical construction is useful to explain the alliance formation, it is also insufficient to explain the coexistence of different objectives in one strategic need. On its own, this means that none of the theoretical rationales presented in this study are holistic. They each explain the formation of strategic alliances from a narrow point of view that is insufficient to capture the complexity of the strategic alliance formation.

Thus, this study introduces a new approach to alliance formation that is the *strategic need* perspective to overcome this theoretical limitation. This perspective, blending together various theoretical streams, provides a more useful mean in understanding the formation of strategic alliances. In this study, I offered theoretical bases for this approach underlying how it provides a working foundation to explain why firms establish strategic alliances. As summarised in Table 20, each perspective justifies one or more strategic need from a strategic alliance point of view. So, for example, the Positioning school, Relational view and Institutional theory lead to theoretical

explanations of *Global market access strategic need*. Following the considerations of Positioning school, firms create alliance to maximizing the presence of the company in several markets enhancing their bargaining power; according to Relational scholars, companies exploit the idiosyncratic relations with foreign companies to expand into unfamiliar markets; and finally, for the Institutional theorists, alliances are developed to enhance a firm's status and image by tapping into the reputation of more established partners. Thus, even if each theoretical construction is useful to explain the alliances formation, to capture the complexity of one strategic need, such as for example the *Global market access*, is necessary to combine together different theories in a unique approach.

Perspective	Theory Focus	Strategic alliance dimension	Strategic need perspective
<i>Positioning school</i>	Firm performance is predicted by industry properties. Company's external environment controls companies' strategic behaviour.	Strategic alliances are a mean to compete with an allied partner against other alliances and to obtain a specific desired position in the market.	<i>Global market access strategic need</i> : firms use alliance to maximizing the presence of the company in several markets enhancing their market power.
<i>Resource Based view</i>	Competitive advantage depends on possessing bundle of unique, rare, durable, and inimitable resources.	Strategic alliances allow to possess or to acquire resources that are lacking; resource pooling is the principal aim.	<i>Efficiency/effectiveness and Knowledge/learning strategic need</i> : forming alliances allows companies to gain access to resources that make them more efficient; alliances are motivated to access to complementary assets, to acquire know-how, and internalize new skills.

<i>Relational view</i>	Competitiveness arises from the network of inter-firm relationships in which one firm is embedded. Idiosyncratic inter-firm linkages may be a source of relational rents and competitive advantage.	Strategic alliances generate competitive advantages since they move the relationship away from the attributes of market transaction in which relationships are not rare or difficult to imitate.	<i>Knowledge/learning and Global market access strategic need:</i> firms enter into alliances to transfer tacit knowledge that is easily transferred through repeated inter-firm relationships; companies exploit the idiosyncratic relations with foreign companies to expand into unfamiliar markets.
<i>Evolutionary perspective</i>	Dynamic models explain the strategy formation considering changes that occur in companies over time. Focus on how companies behave and how the environment affects these behaviors.	Strategic alliances evolve over time and all the phases of an alliance are important, not just the initial conditions. Learning through cooperation.	<i>Knowledge and learning strategic need:</i> firms enter into strategic alliances to learn the new technology from their partners and, in turn, enhance their own competencies.
<i>Transaction cost economics</i>	Existence of the firm; boundary of the firm. Minimizing transaction cost choosing the most efficient mode between market and hierarchy.	Strategic alliance might be the most efficient governance form to manage the transaction.	<i>Efficiency/effectiveness strategic need:</i> alliances are contractual relationships in which companies agree to jointly carry out one or several tasks which are difficult or too costly to carry out alone.
<i>Institutional theory</i>	Institutional environments impose pressures on organizations to appear legitimate and conform to prevailing social norms.	To legitimate themselves (increases reputation, image, prestige and so on) companies participate in strategic alliances.	<i>Global market access strategic need:</i> alliances are developed to enhance a firm's status and image by tapping into the reputation of more established partners.

Table 20 Contribute of major theories to *strategic need* perspective

7.4 Implications from Hypothesis 1 assessment

As already explained in Chapter 1, in this study multiple sources of data are used to address the same phenomenon and this to increase the reliability of the data and

strength of the results. Indeed, I applied a multiple data source triangulation to seek confirmation from several data and reliability of results. Specifically, I validated the results obtained with the secondary data analysis in Chapter 4, by applying the same conceptual approach in two different Italian industries in Chapter 5 and 6. Thus, in this section, merging all the results obtained from the appraisal of hypothesis 1, I would like to generalize the results and underlie how the differences depend on the context under analysis.

First of all, the main finding from the appraisal of the first hypothesis in both primary and secondary data analyses is that companies enter into strategic alliances with complex and multiple inter-firm objectives. Indeed, in all three settings each clusters is characterized by high internal correlation, compared with the low external correlation. Moreover, it was stressed that the internal correlation of the clusters located by the algorithm is greater than the total internal correlation of the whole Pearson matrix. This means that the in all three settings there is always a good cluster separation that is measured by the low internal correlation among clusters. Thus, following these results, I have answered to the first research question of this study: “*Is it possible to group specific inter-firm objectives in clusters characterised by a unique strategic need that managers want to fulfil through alliances?*”. Following the empirical findings, it is possible to group inter-firm objectives in specific clusters, each one characterized by a strategic needs that companies intend to fulfil by forming strategic alliances.

As already anticipated in the previous chapters, and summarized here in Table 21, looking at the composition of each cluster is possible to notice that, depending on the settings under analysis, the mixture of inter-firm objectives that characterized each cluster changes. Investigating the conceptual approach in different industries I offered a deeply understanding of how inter-firm objective’ position in clusters differs depending on specific industries.

To contextualize the general conceptual framework I took into consideration the specific features of machine tool industry; I modified the composition of previous clusters including or eliminating specific inter-firm objectives. For example, compared to the general conceptual framework of Chapter 3, I have considered the inter-firm objective *improving production volume flexibility* and *diversifying product mix* that are objectives strictly related to the industry under investigation. Therefore, compared with the general conceptual model of Chapter 3, here the clusters are

always composed from a mixed portfolio of inter-firm objectives, but this mix is different. It is worthy to notice, how in the MT clusters the inter-firm objectives *long term economies* can be indifferently clustered in Efficiency and Knowledge clusters; as explained in Chapter 5, this is due to the particular meaning assumed by inter-firm objective *long term economies* in the MT industry. This is also true for the inter-firm objective *improving product quality*, that while clustered in both Efficiency and Knowledge clusters in the cross-industry analysis conducted in Chapter 4, in the MT industry finds a more fitting position in the Knowledge cluster because of specific characteristics of the machine tools.

These differences suggest how the belonging of inter-firm objectives to the three clusters is industry dependent. Indeed, while quality improvement in most of the manufacturing industries is seen as a way to improve efficiency through scraps recalls and warranty cost reduction, in the MT industry quality is more related to knowledge needs. Indeed, in this industry the engineering design and the important role of skilled human resources rather than science-based innovation plays a crucial role in technological development and competitive advantage. Moreover, MT industry is a typical light manufacturing industry associated with batches or discrete production runs, instead of heavy manufacturing usually associated to continuous processing as in the assembly of automobiles or the manufacture of gasoline and petroleum. Thus, while in heavy manufacturing long term economies are more related to volume production, and therefore to scale economies, in an industry strongly knowledge-based and highly skilled human resources, such as the machine tool, long term economies are of course related to efficiency achievement, but they are also related to the collaborative learning and for this reason clustered in the knowledge cluster.

Thus, summing up, despite of the secondary data clusters in which are collected agreements from several typologies of industry in a specific manufacturing sector the position of some inter-firm objective depends on the peculiarities of the context and for this reason, the composition of clusters vary among the two datasets.

The same considerations can be done for the analysis of the bio/pharma primary data, conducted in Chapter 6. Also in this context, to contextualize the general conceptual framework I took into consideration the specific features of biotechnology and pharmaceutical industry; I modified the composition of previous clusters including or eliminating specific inter-firm objectives. For example, compared to the general conceptual framework of Chapter 3, the literature analysis suggests how the inter-firm

objective *reducing new product development time* is more related with Knowledge and learning needs. Indeed, in this industry “time to market” is not a matter of engineering and manufacturing, as in the manufacturing industry, but it essentially depends on research and development issues. Therefore, the reduction of “time to market” in the pharmaceutical industry requires the acquisition of research knowledge and learning skills, so that this inter-firm objective is more related to a Knowledge cluster. This is the reason why, in the pharmaceutical industry the hypothesized cluster composition is different from that of Chapter 3 and 4. Nevertheless, the empirical results for the pharmaceutical industry reveal other interesting differences in the clusters composition. More specifically, in this case, the main differences concern the position of *improving product* and *process quality* and *reducing financial risk*. As far as the product quality is concerned, the same reasoning of the machine tool industry holds; indeed, *improving product quality* in the biotechnology and pharmaceutical industry essentially depends on R&D activities, so that the improvement of the quality of a bio/pharma product requires the acquisition of more knowledge. What can be difficult to understand is why process quality is belonging to the Knowledge/learning cluster. This is due to the strong correlation between the product and process quality that, as a matter of fact, can be in some sense questionable in this industry, but, in any case, is perceived strictly correlated by the respondents. Moreover, while in the other sectors, the financial risk reduction is more related to efficiency inter-firm objectives, in the bio/pharma context, globalization allows at increasing the sales volume reducing the incidence of R&D cost and, therefore, reducing the risk due to sunk research and development costs. For this reason, the objective reducing financial risk is clustered in Globalization cluster instead of in Efficiency cluster.

Summing up, these considerations lead to the conclusion that the industrial context of alliances exercises direct impacts on inter-firm relationship formation. Specifically, an industry may be classified along numerous dimensions, such as resource consumption levels, capital investment, labor scarcity, knowledge intensity, and technological innovation. This multidimensionality means that potentially many industry factors drive organizational strategies in seeking alliances for comparative advantage. And, since this multidimensionality influences the decision of a company to internalize certain activities or cooperate with other firms, it also affects the strategic need to fulfill through this cooperation. For example, it was demonstrated that rapid

technological changes, or the abrupt emergence of a competence-destroying technology, repeatedly shown in the bio/pharma industry, can shift toward a more knowledge intent the motivation for allying, compared to a mature industry in which the principal purpose for cooperating is acquire more efficiency in production.

Datasets	Efficiency cluster	Knowledge cluster	Globalization cluster
<i>Secondary data analysis</i>	<ul style="list-style-type: none"> -Long term economies -Reducing operative cost -Reducing labour cost -Reducing lead time -Reducing time to market -Improving product quality -Improving process quality -Reducing financial risk -Standardization of product and process 	<ul style="list-style-type: none"> -Improving product quality -Acquiring and developing new knowledge -Sharing and pooling complementary resources -Developing innovative product -Developing innovative production process 	<ul style="list-style-type: none"> -Entering and developing new markets -Entering and developing new business segment -Improving market share
<i>Machine tool's primary data analysis</i>	<ul style="list-style-type: none"> -Long term economies -Reducing operative cost -Reducing labour cost -Reducing lead time -Reducing time to market -Improving production volume flexibility 	<ul style="list-style-type: none"> -Long term economies -Improving product quality -Acquiring and developing new knowledge -Developing innovative product -Developing innovative production process -Diversifying product mix 	<ul style="list-style-type: none"> -Entering and developing new markets -Entering and developing new business segment -Improving market share
<i>Bio/Pharma's primary data analysis</i>	<ul style="list-style-type: none"> -Long term economies -Reducing labour cost 	<ul style="list-style-type: none"> -Improving product quality -Improving process quality -Sharing and pooling complementary resources -Reducing NPD time -Acquiring and developing new knowledge -Developing innovative product -Developing innovative production process 	<ul style="list-style-type: none"> -Reducing financial risk -Entering and developing new business segment -Improving market share

Table 21 Cluster results in all datasets of the study

7.5 Implications from Hypothesis 2 set assessment

Concrete understanding of the motives of firms to create strategic alliances provides additional insights to purely theoretical understanding of collaboration modes as an alternative to both markets and hierarchies. As explained in Chapter 2 and 3 several studies have argued that modes of collaboration can be ranked along the continuum between arms-length transactions and a fully integrated solution. At the same way, I argued that the governance modes used in this study, in all three datasets (outsourcing, subcontracting, franchising, alliances, partnerships, joint ventures and M&As) could also be ranked along the same continuum. Being outsourcing the mode with less hierarchical control and the most flexible form of cooperation, requiring a relatively low level of control over partners, is the governance form that comes closest to market transactions. On the other hand, M&As represent the highest level of vertical integration as the partner company is fully controlled by the investing firm, hence they are the governance mode that comes closest to hierarchical form.

Surely, one of the most important finding of this study is that I found empirical support for the proposition that different inter-firm modes can be ranked along a market-hierarchy continuum as has been argued by many scholars. The results of the Brant test prove that ranking governance choices to reflect the market-hierarchy continuum is fully supported by the data of the secondary analysis and partially from primary data. Thus, through the empirical analyses of Chapter 4, 5 and 6 I proved that each strategic need is achieved by a particular typology of alliance mode such as outsourcing, alliance/partnership and so offering an answer to the second research question of this study: *“Are the strategic clusters correlated with particular alliance typologies?”*.

Particularly, as summarized in Table 22, from the secondary data analysis I found that when an inter-firm agreement is established to fulfill efficiency/effectiveness strategic needs, the contractual form used to formalize the agreement is more market oriented, such as outsourcing and alliances agreements. Whereas, when an inter-firm agreement is established to fulfill knowledge and learning or global market entry strategic needs the contractual form used to formalize the agreement is more hierarchy oriented, such as JV and non-equity alliance.

The results of primary data analysis on machine tool industry don't confirm that when an inter-firm agreement is established to fulfill efficiency/effectiveness strategic

needs, the contractual form used to formalize the agreement is more market oriented, such as outsourcing and alliances agreements. While, it is confirmed that when an inter-firm agreement is established to fulfill knowledge and learning strategic need the contractual form used to formalize the agreement is more hierarchy oriented, such as JV and non-equity alliance. Whereas, when an inter-firm agreement is established to fulfill global market entry strategic need the contractual form used to formalize the agreement is indifferently alliances/partnerships, joint venture and M&As.

Finally, following the results of primary data analysis on bio/pharma industry, I found that when an inter-firm agreement is established to fulfill efficiency/effectiveness strategic needs, the contractual form used to formalize the agreement is more market oriented, such as outsourcing and alliances agreements. Whereas, when an inter-firm agreement is established to fulfill knowledge and learning or global market entry strategic needs the contractual form used to formalize the agreement is indifferently alliances/partnerships, joint venture and M&As.

Datasets	Efficiency/effectiveness strategic needs	Knowledge/learning strategic need	Global market entry strategic need
<i>Secondary data analysis</i>	The contractual form used to formalize the agreement is more market oriented, such as in increasing order outsourcing and alliances agreements	The contractual form used to formalize the agreement is more hierarchy oriented, such as in decreasing order JV and non-equity alliance	The contractual form used to formalize the agreement is more hierarchy oriented, such as in decreasing JV and non-equity alliance
<i>Machine tool's primary data analysis</i>	Not supported	The contractual form used to formalize the agreement is more hierarchy oriented, such as in decreasing order JV and M&As	The contractual form used to formalize the agreement is indifferently Alliances/Partnerships and M&As
<i>Bio/Pharma's primary data analysis</i>	The contractual form used to formalize the agreement is more market oriented, such as in increasing order outsourcing and alliances agreements	The contractual form used to formalize the agreement is indifferently Alliances/Partnerships and M&As	The contractual form used to formalize the agreement is indifferently Alliances/Partnerships and M&As

Table 22 Hypothesis 2 results in all datasets of the study

Summing up, the different results of primary analysis compared to secondary analysis suggested how the foreseen linkages between governance forms and clusters of strategic needs are industry dependent. Once again, the intuition was confirmed by industrial data analysis that is the industrial context in which the alliances are embedded directly affects the form of inter-firm relationship. In an industry such as bio/pharma and machine tool, characterized by rapid technological changes, strongly knowledge intensity, and highly technological innovative, I proved that companies apply complex interorganizational modes such as joint ventures and merger and acquisitions if they aim at improving innovative efforts, accessing new markets, intensifying organizational learning and so on. More specifically, when the aim is to fulfill a global market entry needs they indifferently use forms more market oriented such as alliance/partnerships and forms more structured such as M&A and Joint ventures.

7.6 Limitations of the study and further researches

It is important to consider all the previous findings in the light of several limitations associated with this study. At this point, several limitations have been seen.

The first consideration is the choice of the two industrial contexts. For this study, I choose two industries characterized by rapid technology changes that exhibit high levels of alliance formation compared to mature industries, which tend to exhibit consolidation and even decline. Specifically, following the OECD sectorial R&D intensity classification (OECD, 1997) pharmaceutical and biotechnology are high-tech sectors with R&D intensities between 10 and 15%; whereas, machine tool is medium-tech industry with R&D intensities ranging between 3 and about 5%; other industries such as food and beverages, oil and gas have a relatively low R&D intensity of below 1%. This choice might be seen as a limitation for the generalizability of the results, since this intensity of R&D could affect the composition of the cluster and the governance modes of the relationship. To overcome this limitation a possible development of this study is to test the conceptual model in different industries to generalize the results.

Also the second consideration follows an issue of generalizability of the results and concerns the geographical choice of the sample. While the secondary data analysis contains inter-firm agreements from different geographical markets, the two primary

analyses are embedded in a typical Italian manufacturing context. And, since several researches have demonstrated that motivations to ally differ based on the geographical position of the companies, future research should spread the analysis to foreign companies.

The third consideration regards the selection and definition of the inter-firm objectives. While the inter-firm objectives appear to reflect the relevant literature base as well as manager's perspective, additional objectives may exist which motivate alliance formation, especially in the two surveys. For example, some of the objectives may overlap, be constructed as too broad, such as for example *Improving product quality* or *Improving process quality*, or as excessively abstract, such as *Sharing and pooling complementary resources*.

Finally, future research should also extend the context by looking at different types of alliances, distinguish for example between licensing agreements, R&D agreements, marketing alliances etc. Moreover, since in the two survey samples the number of joint venture is quite limited, in the further development of this study should be considered a more significant number of these agreements.

Acknowledging these limitations and insisting on the conclusions, I believe that this study offers significant contributions to the relevant literature on strategic alliance formation within the strategic management field.

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APPENDICES



UCIMU-SISTEMI PER PRODURRE

**UCIMU – SISTEMI
PER PRODURRE**

Associazione Costruttori
Italiani Macchine Utensili

Robot e Automazione



Università degli Studi di Palermo

**UNIVERSITA' DEGLI
STUDI DI PALERMO**

**AN ANALYSIS OF THE INTER-FIRM STRATEGIES IN
THE ITALIAN MACHINE TOOL INDUSTRY**

QUESTIONNAIRE

1. Obiettivo dell'indagine

L'obiettivo principale del presente questionario è analizzare come i produttori italiani di macchine utensili stanno affrontando, attraverso il ricorso a strategie di reti di impresa, le seguenti sfide: la domanda crescente di innovazione, l'aumento della pressione competitiva e la necessità di penetrare nuovi mercati. In particolare, con l'indagine si intende esplorare: come i produttori del settore delle macchine utensili prendono decisioni riguardo la costituzione di reti di imprese; quali sono le principali caratteristiche di tali reti; se esistono delle best practice; quali sono le forme di governance più utilizzate dalle imprese per acquisire maggiore efficienza, conoscenza e diventare globali. L'indagine mira a fornire una conoscenza che può determinare un reale valore aggiunto per le aziende di tutto il settore; infatti, il risultato, in termini pratici per le imprese del settore, è una mappatura delle strategie di rete, dei modelli di governance delle reti e delle relazioni, l'identificazione di eventuali hubs e dei legami più rilevanti con gli altri settori industriali.

2. Struttura e modalità di compilazione del questionario

L'indagine sarà condotta attraverso la somministrazione del presente questionario, organizzato in sette sezioni. Ciascuna sezione del questionario presenta delle modalità di risposta, aperta o chiusa, che variano a seconda dei casi. Nelle domande a *risposta aperta* è richiesto all'intervistato di formulare la risposta nel momento della compilazione del questionario scrivendo la propria risposta nello spazio lasciato in bianco nella tabella a lato della domanda. Nelle domande a *risposta chiusa*, le scelte sono già formulate dall'intervistatore, ed è sufficiente apporre una crocetta su una delle opzioni presentate nelle tabelle. Nel questionario è, inoltre, presente un caso particolare di domanda a risposta chiusa, quella cioè costituita da una "scala", la *scala Likert* d'importanza. All'intervistato si chiede di indicare per ciascuna affermazione il grado d'importanza dato a quanto affermato dall'intervistatore. La scala utilizzata è una scala ad intervalli pentenari che esprimono ciascuno le seguenti dichiarazioni di importanza: 1. Per nulla importante; 2. Poco importante; 3. Di una certa importanza; 4. Importante; 5. Molto importante.

3. Informazioni dell'intervistato

Si prega compilare la tabella seguente, inserendo le informazioni essenziali sul soggetto che sta compilando il questionario.

Nome e Cognome	
Posizione aziendale	
Funzione aziendale	

E' molto importante rispondere a tutte le domande contenute nel questionario. Se non si è sicuri riguardo l'esatta risposta da dare ad una domanda, si prega di segnare comunque l'opzione che più si avvicina alla Vostra opinione e proseguire nella compilazione del questionario. Il questionario dovrebbe essere compilato in circa 30 minuti.

Sezione I – Informazioni generali sull'azienda

I.1. Specificare i principali dati anagrafici dell'azienda.

Denominazione/Ragione sociale	
Sede legale	
Indirizzo e-mail	

I.2. Indicare il fatturato dell'azienda degli ultimi tre anni.

	Fatturato (F) in milioni di euro			
	F < 2	2 < F ≤ 10	10 < F ≤ 50	F > 50
Fatturato 2006				
Fatturato 2007				
Fatturato 2008				

I.3. Indicare il numero dei dipendenti dell'azienda degli ultimi tre anni.

	Dipendenti (D)			
	D < 10	10 < D ≤ 50	50 < D ≤ 250	D > 250
Dipendenti 2006				
Dipendenti 2007				
Dipendenti 2008				

I.4. Indicare l'export in percentuale del fatturato negli ultimi 3 anni.

	Export (E)			
	E < 10%	10% < E ≤ 25%	25% < E ≤ 50%	E > 50%
Export % 2006				
Export % 2007				
Export % 2008				

I.5. Indicare qual' è l'attività produttiva *core* dell'azienda (si possono indicare più scelte).

Sistemi di produzione	
Centri di lavoro	
Componenti di macchine utensili	
Impianti per la produzione di metalli (es. laminatoi)	
Macchine a trasferta	
Macchine di misura	
Macchine utensili speciali	
Presse	
Robot	
Sistemi per la programmazione ed il controllo numerico	
Software CAD-CAE-CAM	
Altro (specificare)	

I.6. Indicare il mercato servito dall'azienda (si possono indicare più scelte).

Automobilistico	
Aeronautico	
Cantieristica	
Impiantistica	
Macchine di movimento terra e per l'edilizia	
Meccanica componenti	
Sistemi di trasporto	
White goods industry (industria degli elettrodomestici)	
Altro (specificare)	

Sezione II – Struttura manageriale e decisionale dell'azienda

II.1. Tra le figure aziendali elencate di seguito, indicare chi è il soggetto responsabile delle decisioni strategiche prese all'interno dell'azienda.

Imprenditore	
Consiglio di amministrazione	
Management	

II.2. Se presente in azienda, indicare com'è composto il Consiglio di Amministrazione (si possono indicare più scelte).

Solo membri della famiglia dell'imprenditore di riferimento	
Membri esterni	
Membri di imprese partecipanti	

II.3. Indicare, tra le opzioni riportate di seguito, il luogo in cui vengono prese le principali decisioni strategiche dell'azienda.

Italia	
Eestero	

II.4. Indicare, tra le opzioni riportate di seguito, quali funzioni aziendali sono presenti nell'organigramma aziendale (si possono indicare più scelte).

Acquisti/approvvigionamento	
Produzione	
Finanza e controllo	
Marketing	
Pianificazione strategica	
Progettazione	
Ricerca & Sviluppo	
Vendite	

II.5. Se presenti partecipazioni d'impresе italiane, indicare le percentuali di partecipazione dell'impresa principale.

< 25%	
Tra il 25% e il 50%	
> 50%	

II.6. Se presenti partecipazioni d'impresе non italiane, indicare le percentuali di partecipazione dell'impresa principale.

< 25%	
Tra il 25% e il 50%	
> 50%	

Sezione III – Livello di internazionalizzazione

III.1. Se presenti, indicare il numero degli **uffici di vendita** nelle aree geografiche evidenziate.

	Numero Uffici Vendita (UV)		
	$1 < UV \leq 3$	$4 < UV \leq 6$	$UV > 6$
Europa			
Nord America			
Giappone			
Cina			

Asia (altro)			
Sud America			

III.2. Se presenti, indicare il numero degli **stabilimenti di produzione propri** nelle aree geografiche evidenziate.

	Numero Stabilimenti Produzione (SP)		
	1 < SP ≤ 3	4 < SP ≤ 6	SP > 6
Europa			
Nord America			
Giappone			
Cina			
Asia (altro)			
Sud America			

III.3. Se presenti, indicare il numero delle **strutture di ricerca e sviluppo** nelle aree geografiche evidenziate.

	Numero Strutture R&S (RS)		
	1 < RS ≤ 3	4 < RS ≤ 6	RS > 6
Europa			
Nord America			
Giappone			
Cina			
Asia (altro)			
Sud America			

Sezione IV – Rete di fornitura

IV.1. Indicare il **numero di fornitori principali**, cioè quelli con cui si hanno transazioni ripetute, che costituiscono la rete di fornitura dell'impresa.

< 5 fornitori	
Tra 5 e 10 fornitori	
Tra 10 e 20 fornitori	
> 20 fornitori	

IV.2. Indicare la **durata media** della relazione istaurata con i fornitori principali della rete di fornitura.

< 2 anni	
Tra 2 e 5 anni	
Tra 5 e 10 anni	
> 10 anni	

IV.3. Indicare quanto l'azienda ritiene importanti le seguenti affermazioni per la gestione e lo sviluppo della rete di fornitura:

	1	2	3	4	5
Rinnovare i contratti con i fornitori al fine di aumentare la forza della relazione					
Sviluppare insieme ai principali fornitori nuove opportunità di business quali nuovi prodotti, nuovi segmenti di business e nuovi mercati					
Investire nella formazione e nell'aggiornamento degli skills dei propri fornitori principali					
Agevolare la creazione di relazioni bilaterali tra i fornitori all'interno della rete di fornitura al fine di migliorare il trasferimento di conoscenza e di best practice					
Investire nella standardizzazione delle interazioni tra i fornitori, per esempio codificando lo scambio delle informazioni, al fine di migliorare lo scambio di conoscenza e il livello di coordinamento					
Promuovere la presenza di un agente all'interno della rete di fornitura in grado di					

migliorare lo scambio di informazioni al fine di ridurre il rischio e aumentare la cooperazione all'interno della rete					
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IV.4. Indicare quanto l'azienda ritiene importanti le seguenti dimensioni al fine di consolidare le relazioni all'interno della rete di fornitura:

	1	2	3	4	5
Fiducia, reputazione e relazioni precedenti					
Risorse strategiche quali conoscenza, skills, asset tecnologici e produttivi					
Riduzione del rischio riguardante l'opportunità, problemi di hold-up e hold-out, e l'asimmetria informativa					
Migliorare l'efficienza e/o la prontezza e la flessibilità della rete di fornitura					

Sezione V – Obiettivi strategici

V.1. Indicare quanto l'azienda ritiene importante il raggiungimento di ciascun obiettivo strategico.

	1	2	3	4	5
Miglioramento dell'efficienza					
Sviluppo asset di conoscenza					
Sviluppo dei mercati					
Globalizzazione delle vendite e della produzione					

V.2. Indicare quanto l'azienda ritiene importante le seguenti dimensioni relative ad una strategia di efficienza.

	1	2	3	4	5
Ottenimento economie di scala					
Ottenimento economie di apprendimento					
Riduzione dei costi del lavoro					
Riduzione dei costi dei componenti					
Standardizzazione dei processi					
Standardizzazione dei prodotti					
Riduzione dei time to market					
Riduzione dei lead-time					
Incremento della qualità del prodotto					
Incremento della qualità del processo					

V.3. Indicare quanto l'azienda ritiene importante le seguenti dimensioni relative ad una strategia di sviluppo di conoscenza.

	1	2	3	4	5
Sviluppo know-how e skills (sviluppo di nuove: conoscenze tecnico-scientifiche, tecnologie processo/prodotto, conoscenza dei mercati e delle esigenze del cliente)					
Sviluppo di nuovi prodotti					
Sviluppo di nuovi processi (produttivi e organizzativi)					

V.4. Indicare quanto l'azienda ritiene importante le seguenti dimensioni relative ad una strategia di sviluppo dei mercati.

	1	2	3	4	5
Incremento (valore e/o volume) delle quote di mercato di mercati già serviti					
Sviluppo di nuovi segmenti di business (nuovi prodotti, nuovi clienti, nuovi canali di distribuzione)					

V.5. Indicare quanto l'azienda ritiene importante le seguenti dimensioni relative ad una strategia di globalizzazione.

	1	2	3	4	5

Penetrazione di nuovi mercati esteri					
Sviluppo di mercati esteri già serviti dall'azienda					

Sezione VI – Strategie di rete

VI.1. Indicare quanto l'azienda ritiene importante lo sviluppo di strategie di rete *ad hoc* (Outsourcing, Alleanze/Partnership, Joint Venture, Fusioni/Acquisizioni) al fine di realizzare i propri obiettivi strategici.

1. Per nulla importante	
2. Poco importante	
3. Di una certa importanza	
4. Importante	
5. Molto importante	

VI.2. Indicare quante operazioni di outsourcing, alleanze/partnership, joint venture e fusioni/acquisizioni sono state realizzate dall'azienda negli ultimi 10 anni.

Numero di operazioni di Outsourcing (O)		
$1 < O \leq 3$	$4 < O \leq 6$	$O > 6$

Numero di accordi di Alleanza/partnership (A)		
$1 < A \leq 3$	$4 < A \leq 6$	$A > 6$

Numero di accordi di Joint Venture (JV)		
$1 < JV \leq 2$	$3 < JV \leq 5$	$JV > 5$

Numero di operazioni di Fusione/acquisizione (F)		
$1 < F \leq 2$	$3 < F \leq 5$	$F > 5$

(a) Per ciascuna **operazione di outsourcing** realizzata dall'azienda negli ultimi dieci anni, si prega di rispondere alle seguenti domande duplicando la pagina e contrassegnando con un codice identificativo (O1, O2, ..On) ciascuna operazione.

Codice identificativo: _____

VI(a).1. Indicare la tipologia di attività che è stata esternalizzata (si possono indicare più scelte).

Produzione di componenti core	
Produzione di componenti non core	
Produzione di servizi core	
Produzione di servizi non core	

VI(a).2. Indicare la durata del contratto di outsourcing.

Numero di Anni (An)		
An < 1	1 < An ≤ 3	An > 3

VI(a).3. Indicare il numero di partner coinvolti nell'operazione di outsourcing.

Contratto bilaterale	
Contratto multilaterale	

VI(a).4. Indicare, tra le opzioni riportate di seguito, il settore di riferimento dell'azienda/e con cui si è realizzato l'accordo di outsourcing.

Componentistica elettronica	
CAD-CAM-CAE	
Commercializzazione e assistenza post-vendita	
Componentistica meccanica	
Macchine e dispositivi elettrici (motori, alternatori, etc.)	
Produzione di materiali non metallici	
Produzione di metalli e metallurgia	
Robot	
Servizi di engineering	
Servizi di facility management	
Servizi di logistica	
Servizi di manutenzione	
Servizi finanziari	
Sistemi di automazione	
Sistemi di material handling	
Software di programmazione e controllo	
Utensili e stampi	
Altro (specificare)	

(b) Per ciascun **accordo di alleanza/partnership** realizzato dall'azienda negli ultimi dieci anni, si prega di rispondere alle seguenti domande duplicando la pagina e contrassegnando con un codice identificativo (A1, A2, ...An) ciascuna operazione.

Codice identificativo: _____

VI(b).1. Indicare la tipologia di alleanza/partnership realizzata (si possono indicare più scelte).

Alleanza/partnership commerciale	
Alleanza/partnership produttiva	
Alleanza/partnership di ricerca	
Alleanza/partnership di sviluppo nuovi prodotti e servizi	
Alleanza/partnership finanziaria	

VI(b).2. Indicare se l'alleanza/partnership è di tipo orizzontale o verticale.

Alleanza/partnership orizzontale	
Alleanza/partnership verticale	

VI(b).3. Indicare la durata dell'accordo di alleanza/partnership.

Numero di anni (An)		
An < 3	3 < An ≤ 5	An > 5

VI(b).4. Indicare il numero di partner coinvolti nell'accordo di alleanza/partnership.

Contratto bilaterale	
Contratto multilaterale	

VI(b).5. Indicare, tra le opzioni riportate di seguito, il settore di riferimento dell'azienda/e con cui si è realizzato l'accordo di alleanza/partnership.

Componentistica elettronica	
CAD-CAM-CAE	
Commercializzazione e assistenza post-vendita	
Componentistica meccanica	
Macchine e dispositivi elettrici (motori, alternatori, etc.)	
Produzione di materiali non metallici	
Produzione di metalli e metallurgia	
Robot	
Servizi di engineering	
Servizi di facility management	
Servizi di logistica	
Servizi di manutenzione	
Servizi finanziari	
Sistemi di automazione	
Sistemi di material handling	
Software di programmazione e controllo	
Utensili e stampi	
Altro (specificare)	

(c) Per ciascun **accordo di joint venture** realizzato dall'azienda negli ultimi dieci anni, si prega di rispondere alle seguenti domande duplicando la pagina e contrassegnando con un codice identificativo (JV1, JV2, ...JVn) ciascuna operazione.

Codice identificativo: _____

VI(c).1. Indicare la tipologia di joint venture che è stata realizzata (si possono indicare più scelte).

Joint venture commerciale	
Joint venture produttiva	
Joint venture di ricerca	
Joint venture di sviluppo nuovi prodotti e servizi	
Joint venture finanziaria	

VI(c).2. Indicare se l'accordo di joint venture è di tipo orizzontale o verticale.

Joint venture orizzontale	
Joint venture verticale	

VI(c).3. Indicare la durata dell'accordo di joint venture.

Numero di Anni (An)		
An < 3	3 < An ≤ 5	An > 5

VI(c).4. Indicare il numero di partner coinvolti nell'accordo di joint venture.

Contratto bilaterale	
Contratto multilaterale	

VI(c).5. Indicare, tra le opzioni riportate di seguito, il settore di riferimento dell'azienda/e con cui si è realizzato l'accordo di joint venture.

Componentistica elettronica	
CAD-CAM-CAE	
Commercializzazione e assistenza post-vendita	
Componentistica meccanica	
Macchine e dispositivi elettrici (motori, alternatori, etc.)	
Produzione di materiali non metallici	
Produzione di metalli e metallurgia	
Robot	
Servizi di engineering	
Servizi di facility management	
Servizi di logistica	
Servizi di manutenzione	
Servizi finanziari	
Sistemi di automazione	
Sistemi di material handling	
Software di programmazione e controllo	
Utensili e stampi	
Altro (specificare)	

(d) Per ciascuna **operazione di fusione/acquisizione** realizzata dall'azienda negli ultimi dieci anni, si prega di rispondere alle seguenti domande duplicando la pagina e contrassegnando con un codice identificativo (F1, F2, ..Fn) ciascuna operazione.

Codice identificativo: _____

VI(d).1. Indicare la tipologia dell'operazione.

Fusione	
Acquisizione	

VI(d).2. Indicare se l'operazione di fusione/acquisizione riguarda:

Cliente	
Fornitore	
Azienda concorrente	

VI(d).3. L'operazione di fusione/acquisizione è stata preceduta da una operazione di alleanza/partnership o di joint venture?

SI	
NO	

VI(d).4. Indicare, tra le opzioni riportate di seguito, il settore di riferimento dell'azienda/e con cui si è realizzato la fusione/acquisizione.

Componentistica elettronica	
CAD-CAM-CAE	
Commercializzazione e assistenza post-vendita	
Componentistica meccanica	
Macchine e dispositivi elettrici (motori, alternatori, etc.)	
Produzione di materiali non metallici	
Produzione di metalli e metallurgia	
Robot	
Servizi di engineering	
Servizi di facility management	
Servizi di logistica	
Servizi di manutenzione	
Servizi finanziari	
Sistemi di automazione	
Sistemi di material handling	
Software di programmazione e controllo	
Utensili e stampi	
Altro (specificare)	

Sezione VII – Dimensioni strategiche delle strategie di rete

Per ciascuna **strategia di rete** (*outsourcing, alleanza/partnership, joint venture, acquisizioni/fusioni*) individuata nelle precedenti sezioni si prega di rispondere alla seguente domanda duplicando la pagina e indicando ciascuna operazione con lo stesso codice identificativo precedentemente utilizzato.

Codice identificativo: _____

VII.1. Indicare l'importanza delle seguenti dimensioni strategiche che si intendevano perseguire attraverso l'accordo rete.

	1	2	3	4	5
Riduzione dei costi dei componenti attraverso l'accordo con imprese specializzate nella produzione di componenti (economie di scala e di apprendimento)					
Riduzione dei costi di manodopera attraverso l'accordo di produzione con imprese localizzate in paesi a basso costo del lavoro					
Riduzione dei costi indiretti attraverso l'accordo con imprese fornitrici di attività fonti di spese generali					
Miglioramento del lead time della supply chain attraverso l'accordo con imprese specializzate*					
Miglioramento del time to market dei prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di standardizzazione dei prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Acquisizione know-how e skill necessari allo sviluppo di nuovi prodotti/tecnologie attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione tecnologica del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Ampliamento della gamma dei prodotti attraverso l'accordo con imprese specializzate*					
Incremento della flessibilità del volume di produzione attraverso l'accordo con un'impresa fornitrice di capacità produttiva					
Miglioramento delle quote di mercato esistenti attraverso l'accordo per la produzione di componenti e/o attraverso l'accordo con imprese fornitrici di servizi di commercializzazione e post-vendita					
Penetrazione di nuovi segmenti di business attraverso l'accordo con imprese fornitrici di servizi di commercializzazione, post vendita e marketing					
Penetrazione di mercati esteri attraverso l'accordo con imprese fornitrici di servizi di commercializzazione, post vendita e marketing					
Riduzione del rischio finanziario attraverso l'accordo per la realizzazione di attività capital intensive					
Riduzione del rischio di opportunismo attraverso l'accordo con imprese con cui già esistono relazioni di mercato					
Ottenimento di competenze complementari con il partner					
Condivisione di obiettivi strategici con il partner					
Condivisione di pregresse esperienze di collaborazione con il partner					

*imprese specializzate nella realizzazione di componenti e/o nelle fasi di progettazione e sviluppo prodotto



FARMINDUSTRIA



**UNIVERSITA' DEGLI
STUDI DI PALERMO**

Università degli Studi di Palermo

**AN ANALYSIS OF THE INTER-FIRM STRATEGIES IN
THE ITALIAN BIOTECHNOLOGY AND
PHARMACEUTICAL INDUSTRY**

QUESTIONNAIRE

1. Obiettivo dell'indagine

La competitività delle imprese nell'attuale contesto economico è sempre più basata sulla capacità delle imprese di creare reti competitive sia con partner complementari che con i propri competitors. In tale scenario, la strategia di rete diventa un elemento essenziale della strategia competitiva delle imprese, in particolare modo nei settori farmaceutico e biotecnologico. L'indagine empirica vuole analizzare quali strategie di rete le imprese italiane pharma e bio-tech intraprendono per affrontare la globalizzazione, per sviluppare nuove conoscenze necessarie a sviluppare nuovi prodotti e per migliorare la propria efficacia ed efficienza; inoltre, si vuole capire come si concretizzano in termini di governance proprio i rapporti tra le aziende farmaceutiche e quelle di biotecnologie. Il risultato dell'analisi empirica sarà la mappatura delle strategie di rete nel settore, l'individuazione delle best practice, l'individuazione di settori con cui si stabiliscono relazioni co-operative e competitive, indicazioni manageriali su come costruire rapporti di governance di successo tra imprese farmaceutiche e biotecnologiche.

2. Struttura e modalità di compilazione del questionario

L'indagine sarà condotta attraverso la somministrazione del presente questionario, organizzato in sei sezioni. Ciascuna sezione del questionario presenta delle modalità di risposta, aperta o chiusa, che variano a seconda dei casi. Nelle domande a *risposta aperta* è richiesto all'intervistato di formulare la risposta nel momento della compilazione del questionario scrivendo la propria risposta nello spazio lasciato in bianco nella tabella a lato della domanda. Nelle domande a *risposta chiusa*, le scelte sono già formulate dall'intervistatore, ed è sufficiente apporre una crocetta su una delle opzioni presentate nelle tabelle. Nel questionario è, inoltre, presente un caso particolare di domanda a risposta chiusa, quella cioè costituita da una "scala", la *scala Likert* d'importanza. All'intervistato si chiede di indicare per ciascuna affermazione il grado d'importanza dato a quanto affermato dall'intervistatore. La scala utilizzata è una scala ad intervalli pentenari che esprimono ciascuno le seguenti dichiarazioni di importanza: 1. Per nulla importante; 2. Poco importante; 3. Di una certa importanza; 4. Importante; 5. Molto importante.

3. Informazioni del/i compilatore/i dell'intervistato

Si prega di inserire le informazioni essenziali sul/i soggetto/i che sta compilando il questionario.

	Posizione aziendale	Funzione aziendale
Compilatore 1		
Compilatore 2		
Compilatore 3		

E' molto importante rispondere a tutte le domande contenute nel questionario. Se non si è sicuri riguardo l'esatta risposta da dare ad una domanda, si prega di segnare comunque l'opzione che più si avvicina alla Vostra opinione e proseguire nella compilazione del questionario. Il questionario dovrebbe essere compilato in circa 30 minuti.

Sezione I – Informazioni generali sull’impresa (se multinazionale specificare solo i dati relativi alla sede italiana)

I.1. Specificare i principali dati anagrafici dell’impresa.

Denominazione/Ragione sociale	
Sede legale	
Indirizzo e-mail	

I.2. Indicare da quanti anni l’impresa è presente nel settore.

	A < 2	2 < A ≤ 5	5 < A ≤ 10	10 < A ≤ 20	A > 20
Anni					

I.3. Indicare il fatturato (in milioni di euro), il numero dei dipendenti e l’export in percentuale del fatturato dell’impresa degli ultimi tre anni.

	F < 2	2 < F ≤ 10	10 < F ≤ 50	F > 50
Fatturato 2006				
Fatturato 2007				
Fatturato 2008				
	D < 10	10 < D ≤ 50	50 < D ≤ 250	D > 250
Dipendenti 2006				
Dipendenti 2007				
Dipendenti 2008				
	E < 10%	10% < E ≤ 25%	25% < E ≤ 50%	E > 50%
Export % 2006				
Export % 2007				
Export % 2008				

I.4. Indicare, segnando con una x la casella corrispondente, se sono presenti uffici di vendita, stabilimenti di produzione propri e strutture di ricerca e sviluppo nelle aree geografiche evidenziate.

	Uffici Vendita	Stabilimenti Produzione	Ricerca e Sviluppo
Europa			
Nord America			
Giappone			
Cina			
Asia (altro)			
Sud America			

Sezione II – Struttura manageriale e decisionale dell’impresa

Soggetto responsabile delle decisioni strategiche prese dall’impresa	
Imprenditore	
Management	
Incidenza delle attività R&S svolte internamente all’impresa relative ad un nuovo prodotto/tecnologia	
< 25%	
Tra il 25% e il 75%	
> 75%	
Se presente capitale d’imprese non italiane, indicare la percentuale dell’impresa principale	
< 25%	
Tra il 25% e il 50%	
> 50%	

Sezione III – Rete di fornitura

III.1. Indicare quanto l’impresa ritiene importanti le seguenti affermazioni per la gestione, lo sviluppo e il consolidamento delle relazioni all’interno della rete di fornitura.

	1	2	3	4	5
Rinnovare i contratti con i fornitori al fine di aumentare la forza della relazione					

Sviluppare insieme ai principali fornitori nuove opportunità quali nuovi prodotti, nuovi segmenti e nuovi mercati					
Investire nella formazione e nell'aggiornamento degli skills dei propri fornitori principali					
Agevolare la creazione di relazioni bilaterali tra i fornitori all'interno della rete di fornitura al fine di migliorare il trasferimento di conoscenza e di best practice					
Investire nella standardizzazione delle interazioni tra i fornitori (es. codificando lo scambio delle informazioni) al fine di migliorare lo scambio di conoscenza e il livello di coordinamento					
Promuovere la presenza di un agente all'interno della rete di fornitura in grado di migliorare lo scambio di informazioni per ridurre il rischio e aumentare la cooperazione all'interno della rete					
Fiducia, reputazione e relazioni precedenti					
Risorse strategiche quali conoscenza, skills, asset tecnologici e produttivi					
Riduzione del rischio riguardante l'opportunità e l'asimmetria informativa					
Migliorare l'efficienza e/o la prontezza e la flessibilità della rete di fornitura					

Sezione IV – Obiettivi strategici

IV.1. Indicare quanto l'impresa ritiene importante il raggiungimento di ciascun obiettivo strategico.

	1	2	3	4	5
Miglioramento dell'efficienza					
Sviluppo asset di conoscenza					
Sviluppo dei mercati					
Globalizzazione delle vendite e della produzione					

IV.2. Indicare quanto l'impresa ritiene importante le dimensioni relative ad una strategia di efficienza.

	1	2	3	4	5
Ottenimento economie di scala					
Ottenimento economie di apprendimento					
Riduzione dei costi del lavoro					
Riduzione dei costi dei componenti e delle materie prime					
Standardizzazione dei processi					
Standardizzazione dei prodotti					
Riduzione del tempo di sviluppo di nuovi prodotti					
Incremento della qualità del prodotto					
Incremento della qualità del processo					

IV.3. Indicare quanto l'impresa ritiene importante le dimensioni relative ad una strategia di sviluppo di conoscenza.

	1	2	3	4	5
Sviluppo know-how e skills (sviluppo di nuove: conoscenze tecnico-scientifiche, tecnologie processo/prodotto, conoscenza dei mercati e delle esigenze del cliente)					
Sviluppo di nuovi prodotti e tecnologie					

IV.4. Indicare quanto l'impresa ritiene importante le seguenti dimensioni relative ad una strategia di sviluppo dei mercati e della globalizzazione.

	1	2	3	4	5
Incremento (valore e/o volume) delle quote di mercato di mercati già serviti					
Sviluppo di nuovi segmenti (nuovi prodotti, nuovi segmenti di consumatori, nuovi canali di distribuzione)					
Penetrazione di nuovi mercati esteri					
Sviluppo di mercati esteri già serviti dall'impresa					

Sezione V – Strategie di rete

V.1. Indicare quanto l'impresa ritiene importante lo sviluppo di strategie di rete *ad hoc* (Outsourcing, Alleanze/Partnership, Joint Venture, Fusioni/Acquisizioni) al fine di realizzare i propri obiettivi strategici.

1. Per nulla importante	
2. Poco importante	
3. Di una certa importanza	
4. Importante	
5. Molto importante	

V.2. Indicare il numero di operazioni di outsourcing, alleanze/partnership, joint venture e fusioni/acquisizioni che sono state realizzate dall'impresa.

	Numero di operazioni
Operazioni di Outsourcing (Out) negli ultimi 5 anni	
Accordi di Alleanza/partnership (All) negli ultimi 10 anni	
Accordi di Joint Venture (JV) negli ultimi 10 anni	
Operazioni di Fusione/acquisizione (A/F) negli ultimi 10 anni	

V.3. Indicare quanto l'impresa ritiene importanti le seguenti affermazioni.

	1	2	3	4	5
Lo sviluppo di relazioni tra imprese farmaceutiche e di biotech è tanto più necessario quanto più scarse sono le risorse finanziarie a disposizione delle imprese biotech per sviluppare attività di R&S					
Lo sviluppo di relazioni tra imprese farmaceutiche e di biotecnologie è tanto più necessario quanto più la scadenza dei brevetti pone un problema di competitività alle imprese farmaceutiche					
Lo sviluppo di relazioni tra imprese farmaceutiche e di biotech è tanto più necessario quanto più l'impresa pharma basa la sua strategia commerciale nell'immissione di nuovi prodotti nel mercato					

V(a).1 Per le 5 operazioni di outsourcing più significative (Out 1, ..., 5) realizzate dall'impresa negli ultimi cinque anni, si prega di rispondere alle seguenti domande.

	Out 1	Out 2	Out 3	Out 4	Out 5
Tipologia di attività esternalizzata					
Produzione core					
Produzione non core					
Produzione di servizi core					
Produzione di servizi non core					
Durata del contratto di outsourcing					
Anni <1					
1 < Anni ≤ 3					
Anni > 3					
Numero partner coinvolti nell'operazione di outsourcing					
Contratto bilaterale					
Contratto multilaterale					
Settore di riferimento dell'impresa con cui si sono realizzate le operazioni					
Biotechologie					
Commercializzazione e assistenza post-vendita					
Enti di Ricerca e Sviluppo pubblici e privati					
Farmaceutica					
Impianti e Macchinari					
Industria dei materiali e principi attivi					
Packaging					
Servizi di engineering					
Servizi di facility management					
Servizi di logistica interna ed esterna					
Servizi di manutenzione					
Servizi finanziari					
Software gestionali					
Sviluppo pre-clinico					

Altro (specificare)					
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V(a).2. Indicare l'importanza delle seguenti **dimensioni strategiche**, che si intendevano perseguire attraverso le operazioni di **outsourcing**. Inserire il valore **1** se si ritiene l'affermazione **Per nulla importante**; **2. Poco importante**; **3. Di una certa importanza**; **4. Importante**; **5. Molto importante**.

	Out1	Out2	Out3	Out4	Out5
Riduzione dei costi di materie prime e componenti attraverso l'accordo con imprese in grado di sviluppare economie di scala e di apprendimento					
Riduzione dei costi di manodopera attraverso l'accordo di produzione con imprese localizzate in paesi a basso costo del lavoro					
Miglioramento del tempo di sviluppo di nuovi prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di standardizzazione dei prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Acquisizione conoscenze e competenze necessarie allo sviluppo di nuovi prodotti/tecnologie attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione tecnologica del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Miglioramento delle quote di mercato esistenti attraverso l'accordo con imprese di distribuzione e/o commercializzazione					
Penetrazione di mercati esteri attraverso l'accordo con imprese fornitrici di servizi di commercializzazione, post vendita e marketing					
Riduzione del rischio finanziario attraverso l'accordo per la realizzazione di attività capital intensive					
Riduzione del rischio di opportunismo attraverso l'accordo con imprese con cui già esistono relazioni di mercato					
Ottenimento di competenze complementari con il partner					
Condivisione di obiettivi strategici con il partner					
Condivisione di pregresse esperienze di collaborazione con il partner					

* nella realizzazione di materie prime e/o componenti e/o nelle fasi di progettazione e sviluppo prodotto

V(b).1 Per **5 accordi di alleanza/partnership** (All 1, ..., 5) realizzati dall'impresa negli **ultimi dieci anni**, si prega di rispondere alle seguenti domande.

	All 1	All 2	All 3	All 4	All 5
Tipologia di alleanza/partnership					
Alleanza/partnership commerciale					
Alleanza/partnership produttiva					
Alleanza/partnership di ricerca di base					
Alleanza/partnership di sviluppo nuovi prodotti e servizi					
Alleanza/partnership finanziaria					
Alleanza/partnership orizzontale o verticale					
Alleanza/partnership orizzontale					
Alleanza/partnership verticale					

Durata degli accordi di alleanza/partnership					
Anni <3					
3 < Anni ≤ 5					
Anni > 5					
Numero partner coinvolti negli accordi di alleanza/partnership					
Accordo bilaterale					
Accordo multilaterale					
Settore di riferimento dell'impresa con cui si sono realizzati gli accordi					
Biotechologie					
Commercializzazione e assistenza post-vendita					
Enti di Ricerca e Sviluppo pubblici e privati					
Farmaceutica					
Impianti e Macchinari					
Industria dei materiali e principi attivi					
Packaging					
Servizi di engineering					
Servizi di facility management					
Servizi di logistica interna ed esterna					
Servizi di manutenzione					
Servizi finanziari					
Software gestionali					
Sviluppo pre-clinico					
Altro (specificare)					

V(b).2. Indicare l'importanza delle seguenti **dimensioni strategiche**, che si intendevano perseguire attraverso gli accordi di **alleanza/partnership**. Inserire il valore **1** se si ritiene l'affermazione **Per nulla importante**; **2. Poco importante**; **3. Di una certa importanza**; **4. Importante**; **5. Molto importante**.

	Out1	Out2	Out3	Out4	Out5
Riduzione dei costi di materie prime e componenti attraverso l'accordo con imprese in grado di sviluppare economie di scala e di apprendimento					
Riduzione dei costi di manodopera attraverso l'accordo di produzione con imprese localizzate in paesi a basso costo del lavoro					
Miglioramento del tempo di sviluppo di nuovi prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di standardizzazione dei prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Acquisizione conoscenze e competenze necessarie allo sviluppo di nuovi prodotti/tecnologie attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione tecnologica del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Miglioramento delle quote di mercato esistenti attraverso l'accordo con imprese di distribuzione e/o commercializzazione					
Penetrazione di mercati esteri attraverso l'accordo con imprese fornitrici di servizi di commercializzazione, post vendita e marketing					
Riduzione del rischio finanziario attraverso l'accordo per					

la realizzazione di attività capital intensive					
Riduzione del rischio di opportunismo attraverso l'accordo con imprese con cui già esistono relazioni di mercato					
Ottenimento di competenze complementari con il partner					
Condivisione di obiettivi strategici con il partner					
Condivisione di pregresse esperienze di collaborazione con il partner					

* nella realizzazione di materie prime e/o componenti e/o nelle fasi di progettazione e sviluppo prodotto

V(c).1 Per i **5 accordi di joint venture (JV 1, ..., 5)** realizzati dall'impresa negli **ultimi dieci anni**, si prega di rispondere alle seguenti domande.

	JV 1	JV 2	JV 3	JV 4	JV 5
Tipologia di Joint Venture					
Joint venture commerciale					
Joint venture produttiva					
Joint venture di ricerca di base					
Joint venture di sviluppo nuovi prodotti e servizi					
Joint venture finanziaria					
Joint Venture orizzontale o verticale					
Joint Venture orizzontale					
Joint Venture verticale					
Durata degli accordi di joint venture					
Anni <3					
3 < Anni ≤ 5					
Anni > 5					
Numero partner coinvolti negli accordi di joint venture					
Accordo bilaterale					
Accordo multilaterale					
Settore di riferimento dell'impresa con cui si sono realizzati gli accordi					
Biotecnologie					
Commercializzazione e assistenza post-vendita					
Enti di Ricerca e Sviluppo pubblici e privati					
Farmaceutica					
Impianti e Macchinari					
Industria dei materiali e principi attivi					
Packaging					
Servizi di engineering					
Servizi di facility management					
Servizi di logistica interna ed esterna					
Servizi di manutenzione					
Servizi finanziari					
Software gestionali					
Sviluppo pre-clinico					
Altro (specificare)					

V(c).2. Indicare l'importanza delle seguenti **dimensioni strategiche**, che si intendevano perseguire attraverso gli accordi di **joint venture**. Inserire il valore **1** se si ritiene l'affermazione **Per nulla importante**; **2. Poco importante**; **3. Di una certa importanza**; **4. Importante**; **5. Molto importante**.

	Out1	Out2	Out3	Out4	Out5
Riduzione dei costi di materie prime e componenti attraverso l'accordo con imprese in grado di sviluppare economie di scala e di apprendimento					
Riduzione dei costi di manodopera attraverso l'accordo di produzione con imprese localizzate in paesi a basso costo del lavoro					
Miglioramento del tempo di sviluppo di nuovi prodotti					

attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di standardizzazione dei prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Acquisizione conoscenze e competenze necessarie allo sviluppo di nuovi prodotti/tecnologie attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione tecnologica del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Miglioramento delle quote di mercato esistenti attraverso l'accordo con imprese di distribuzione e/o commercializzazione					
Penetrazione di mercati esteri attraverso l'accordo con imprese fornitrici di servizi di commercializzazione, post vendita e marketing					
Riduzione del rischio finanziario attraverso l'accordo per la realizzazione di attività capital intensive					
Riduzione del rischio di opportunismo attraverso l'accordo con imprese con cui già esistono relazioni di mercato					
Ottenimento di competenze complementari con il partner					
Condivisione di obiettivi strategici con il partner					
Condivisione di pregresse esperienze di collaborazione con il partner					

* nella realizzazione di materie prime e/o componenti e/o nelle fasi di progettazione e sviluppo prodotto

V(d).1 Per le 5 operazioni di fusione/acquisizione (F/A 1, ..., 5) realizzate dall'impresa negli ultimi dieci anni, si prega di rispondere alle seguenti domande.

	F/A 1	F/A 2	F/A 3	F/A 4	F/A 5
Tipologia di operazione					
Fusione					
Acquisizione					
Soggetti coinvolti nelle operazioni di fusione/acquisizione					
Cliente					
Fornitore					
Impresa concorrente					
Operazioni di F/A precedute da operazioni di alleanza/partnership o JV					
Si					
No					
Settore di riferimento dell'impresa con cui si sono realizzate le operazioni					
Biotecnologie					
Commercializzazione e assistenza post-vendita					
Enti di Ricerca e Sviluppo pubblici e privati					
Farmaceutica					
Impianti e Macchinari					
Industria dei materiali e principi attivi					
Packaging					
Servizi di engineering					
Servizi di facility management					

Servizi di logistica interna ed esterna					
Servizi di manutenzione					
Servizi finanziari					
Software gestionali					
Sviluppo pre-clinico					
Altro (specificare)					

V(d).2. Indicare l'importanza delle seguenti **dimensioni strategiche**, che si intendevano perseguire attraverso le operazioni di **fusione/acquisizione**. Inserire il valore **1** se si ritiene l'affermazione **Per nulla importante**; **2. Poco importante**; **3. Di una certa importanza**; **4. Importante**; **5. Molto importante**.

	Out1	Out2	Out3	Out4	Out5
Riduzione dei costi di materie prime e componenti attraverso l'accordo con imprese in grado di sviluppare economie di scala e di apprendimento					
Riduzione dei costi di manodopera attraverso l'accordo di produzione con imprese localizzate in paesi a basso costo del lavoro					
Miglioramento del tempo di sviluppo di nuovi prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di standardizzazione dei prodotti attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento della qualità del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Acquisizione conoscenze e competenze necessarie allo sviluppo di nuovi prodotti/tecnologie attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione tecnologica del prodotto attraverso l'accordo con imprese specializzate*					
Miglioramento del grado di innovazione del processo produttivo attraverso l'accordo con imprese specializzate nella fase di produzione					
Miglioramento delle quote di mercato esistenti attraverso l'accordo con imprese di distribuzione e/o commercializzazione					
Penetrazione di mercati esteri attraverso l'accordo con imprese fornitrici di servizi di commercializzazione, post vendita e marketing					
Riduzione del rischio finanziario attraverso l'accordo per la realizzazione di attività capital intensive					
Riduzione del rischio di opportunismo attraverso l'accordo con imprese con cui già esistono relazioni di mercato					
Ottenimento di competenze complementari con il partner					
Condivisione di obiettivi strategici con il partner					
Condivisione di pregresse esperienze di collaborazione con il partner					

* nella realizzazione di materie prime e/o componenti e/o nelle fasi di progettazione e sviluppo prodotto