SCHOOL OF ECONOMICS & BUSINESS ADMINISTRATION

INTEGRATING STRATEGY & FINANCE THROUGH STRATEGIC ALLIANCES: ORGANIZATIONAL LEARNING & VALUATION PERSPECTIVES

DOCTORAL DISSERTATION

IAN P. L. KWAN

PAMPLONA �֎ 2013

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PAMPLONA � 5 JULY 2013

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Dedicated to

My Mother & Father

Acknowledgements

Introduction

Integrating Strategy & Finance through Strategic Alliances: Organizational Learning & Valuation Perspectives

INTRODUCTION

The desire to integrate the vast fields of finance and strategy is not new. Scholars of both have long felt the need to unify them, each having much to say on their mutual subject in common – firms and the resources that they employ. Strategy for its part is fundamentally concerned about the choices that firms make to seize competitive advantage especially in regards to the directions they take and the resources they engage (Schendel and Patton, 1978). On the part of finance, its main concern is how capital markets value the choices firms make as going concerns (Myers, 1984). Although scholars from both fields have dialogued over the past 30 years over this mutual common ground, gaps still exist that provide opportunities for a continuing integration effort, but not without difficulties. The obstacles vary widely and include amongst other things very different languages and cultures in the respective research traditions (Myer, 1984), very different views on the notion of risk (Lubatkin and Schulze, 2003)[1], and even very different timeframes (Baden-Fuller, 2003)[2]. The bumpy history of the integration effort reflects to some extent these difficulties.

Myers' (1977) seminal idea on real options[3] that presented a way of valuing corporate liabilities provided an initial bridge between the two fields. In spite of Myers' later lament (1984: 126) that finance theory had until then little impact on strategic planning, a flurry of research followed that would soon develop the "real options approach" in ways that would have a major impact on the strategy literature (see for example, Bowman and Hurry, 1993; Kogut, 1991; Kogut and Kulatilaka, 1994; Chi,

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[1] Finance scholars view firm-specific risk as irrelevant because it can be diversified away in a portfolio of assets leaving only the systematic part of risk. For strategy scholars, however, firm-specific risk falls at the very heart of strategic management (Lubatkin and Schulze, 2003).

[2] Whereas finance scholars work in a timeframe where time is measured in seconds, where prices are set openly, and where economic modeling dominates, strategists focus on firms and managers whose decisions take time and where the value of these decisions will not be manifested for years (Badden-Fuller, 2003).

[3] Analogous to financial options, a real option confers a right on a firm to make further (large) investments in a project at a future date as time reveals more information by virtue of initial (small) investments made earlier in the project's life (Myer, 1977; Trigeorgis, 1996)

2000; Reuer and Tong, 2007). Yet the enthusiasm to unify strategy and finance through a real options approach waned. Several surveys would show that only between 6% and 27% of firms would use real options thinking in their capital budgeting processes (Graham and Harvey, 2000; Rigby and Gillies, 2000; Ryan and Ryan, 2002). Even Bowman, who provided some of the early momentum for the real options approach in the strategy field, expressed his reserve pointing to the inherent difficulties of the approach in strategic analysis (Bowman and Moskowitz, 2001). But despite these difficulties, scholars still continue their efforts to bring together finance and strategy evidenced by the various special issues aimed at this task (see Lubatkin and Schulze, 2003; Silverman and Villalonga, 2013).

Against this background, for me there have been at least two challenges to write a dissertation that bridges both these two fields. The first is developing a research agenda that is relevant to *both* without being irrelevant to either one. My experience, for example, writing Paper Two of this dissertation especially brought this challenge home to me. From the start, this paper was written with the idea of publication in a strategy journal. One helpful informal reviewer[4], however, pointed out that the "empirical flavor" with which it was written at the time meant that that version of the paper was probably better suited for an economics or finance journal. This was indeed a helpful early warning of the need to be relevant to the readership. The challenge to be relevant does not seem to be unique to me. Lubatkin and Schulze summarize the notion succinctly with the following words:

> "Unfortunately, fundamental differences in the theoretical assumptions on which modern financial theory […] and strategy were based, caused their paths to diverge to a point where endorsement of one necessarily implied the irrelevance of the other." (Lubatkin and Schulze, 2003: 7)

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[4] I am especially thankful to Prof. Africa Ariño of IESE Business School for pointing this out to me during the early drafts of the paper.

The second challenge, as with all doctoral dissertations, is researching topics that are novel to their field, executable with the resources available, and ample enough to provide a knowledge base on which to continue further research in the post-doctoral phase. Furthermore, given my prior professional experience in business and finance, developing a research agenda in both strategy and finance is of natural interest to me.

Facing both these challenges I chose, thanks to the advice of my two thesis directors, to take a conservative approach that would integrate both strategy and finance, and at the same time keeping them separate. I have aimed to integrate them by harmonizing within each of the three papers the relevant theories of both fields; and I have tried to keep them separate by giving each paper a distinct strategy or finance "flavor" according to the theoretical framework employed, the writing style corresponding to the field that the paper is aimed for, and the topic that is typically found in that field.

To give further focus my dissertation topic, I chose the promising topic of strategic alliances that has captured the attention of both strategy and finance scholars and practioners. One revealing quote by two renowned finance scholars caught my attention and helped me to decide on this topic:

> "… a relative paucity of attention has been paid to [the increasing importance of alliances in both number and complexity] in the economics and finance literature. While strategic alliances have been a focus of organizational and sociology literature, many economic aspects of the arrangements remain unexplored [in the finance literature]. Many of the newer organizational innovations have attracted almost no scrutiny by researchers." (Lerner and Rajan, 2006: 1)

Responding to this call, the three papers of this dissertation, while being separate works of research, at the same time aim to integrate both strategy and finance in a way that respects the research traditions of each field.

Paper One provides a literature review of extant research on strategic alliances taking organization learning and financial valuation perspectives. After reviewing relevant theories and methods as they apply to strategic alliances, I identify two pairs of research gaps, one in strategy and the other in finance which become the focuses for Papers Two and Three of this dissertation. One notable feature of the survey (and which confirms Lerner and Rajan's observation above) is the strong research tradition on alliances in the strategy literature which is not found in finance. The paper is therefore probably best suited for readers who come from a finance tradition and want to quickly familiarize themselves with the strategy alliance literature.

Paper Two is a strategy oriented paper on a growing stream in the organizational learning literature. It aims to unify two large related areas in this field, namely how organizational learning is transferred under two different governance forms, namely the mergers and acquisitions (M&A) and strategic alliances. I study how prior alliance experience is transferred to affect M&A hence the study is about the cross-form effects from alliance experience to acquisition performance. I contribute to the literature by providing empirical evidence to support the theoretical explanations of how prior alliance experience positively affects acquisition performance.

Finally, Paper Three is a finance oriented paper in which I analogously apply the theories of coinsurance of corporate bonds of firms involved in M&As to the bonds of firms involved in alliances. I show that like the bond holders of firms involved in M&As, allying firm's bond holders are positively affected by alliance formation. The results of this paper complement those that show that alliance announcements are value creating for stock holders, filling a gap in both the finance and strategy literatures.

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Paper One:

A Literature Review of Strategic Alliances in the Organizational & Financial Valuation Literatures

ABSTRACT

In this paper, I review relevant theories and methods found in the strategy literature on organizational learning and finance literature on valuation as they concern strategic alliances. On the basis on this review, I identify several research gaps, one of which is the focus of Paper Two and another of Paper Three of this doctoral dissertation. The remaining research gaps are extensions for further research work. The paper aims to contribute to the literature that bridges the gap between the fields of finance and strategy by identifying theories and methods of common interest through their application to strategic alliances.

1. INTRODUCTION

The purpose of this review is to identify relevant theories and methods from the strategy literature on organizational learning and the finance literature on valuation concerning strategic alliances. These will form a basis for proposing several research gaps that I intend to investigate in Papers Two and Three of this doctoral dissertation and research work that will follow thereafter.

The review proceeds as follows: in Section 2, I review the answers to some preliminary questions about strategic alliances that provide a basic introduction to the subject of interest of this dissertation. Section 3 reviews earlier strategy literature on the market-based view, resource-based view, knowledge-based view, and transaction cost approaches and analyzes strategic alliances in the light of each one. It also reviews relevant financial methods of valuation including the discounted cash flow method, real options method, and event study method, again applying them to the case of alliances. Section 4 provides a summary of selected studies on value creation by strategic alliances. Section 5 introduces research gaps seen in the literature, and finally Section 6 concludes.

2. PRELIMINARY QUESTIONS ON STRATEGIC ALLIANCES

Literature on strategic alliances frequently begins by describing a significant aspect of alliance activity to draw the reader's attention. The preliminary issues that are commonly raised in the early sections of the literature provide context for the reader to introduce the main issue to be covered. I would like to do the same here by providing a summary to some preliminary questions on strategic alliances whose answers are often found in the introductory sections of this alliance literature.

2.1 What is a strategic alliance?

A strategic alliance is a cooperative agreement made between two or more independent firms to achieve a mutual set of objectives (Kogut, 1988; Gulati, 1998; Ireland, Hitt, and Vaidyanath, 2002). Through an alliance, firms necessarily commit to share a subset of their tangible and intangible resources (Barney, 1991; Grant, 1991). Tangible resources include physical assets such as plant and equipment, or services such as a proprietary distribution network or computer system, while intangible resources include access to intellectual capital tied up in licensed patents and production processes.

An alliance is a hybrid organizational form through which two or more firms can combine their business resources. The alliance organizational form lies in the continuum between a market exchange contract and a merger of firms (Kogut, 1988; Lerner and Rajan, 2006; Villalonga and McGahan, 2005). Firms can access the resources of another through market exchange contracts quickly and without the buyer and seller knowing each other. Market exchange contracts are characterized by their standard terms, standard product or service quality, industry accepted delivery times, common pricing methods, etc. Firms can also access the resources of another by merging with that firm. Mergers are characterized by their complexity, extended personal negotiations, and information asymmetries (Zollo and Reuer, 2010).

In this dissertation, I will use the term "strategic alliances" as a collective term to mean licensing agreements, franchise agreements, contractual (non-equity) joint ventures, and equity joint ventures (Inkpen, 1998a; Parkhe, 1991).

2.2 Where? How many? How significant?

Alliances are found in almost all industries, in both domestic and international business environments. However, they are most prevalent in high technology, fast-changing, highly competitive, research-intense industries, including computers, telecommunications, pharmaceuticals, chemicals, electronics, biotechnology and services (Kale, Dyer, and Singh, 2002; Rothaermel and Deeds, 2004). Alliances are less common, however in stable, mature industries (Koza and Lewin, 1998).

The empirical findings of Eisenhardt and Schoonhoven's (1996) provide a good answer to the question of where to find alliances from both a strategic as well as social point of view. (a) More alliances are formed in industries that have more competitors. In competitive markets with many players, greater market power can be achieved through an alliance. Alliances with well-known firms also provide legitimacy to less well-known firms especially in a crowded market. (b) There is a greater rate of alliance formation in industries that require greater innovation. As innovative products are costly to create, firms tend to choose alliances to gain access to and share their innovative know-how to reduce costs. (c) Alliances form more often when there are a large number of top management team members. Top management members provide the necessary connections to potential alliance partners. (d) The more previous employees the top management team members have had, the greater will be the rate of alliance formation. (e) The more senior were the previous positions of top management members the more frequent is the rate of alliance formation. (f) Although the empirical support is not strong, the frequency of alliance formation tends to be highest in emergent-stage markets, lower in growth-stage markets, and lowest in mature-stage markets.

International joint ventures are the usual mode of entry for domestic firms to enter into global markets (Berg, Duncan, and Friedman, 1982; Harrigan, 1985),

especially those of emerging economies (Peng, 2003; Fang, 2011) because their structural attributes help firms to reduce risk (Reuer and Leiblein, 2000).

The number of alliances has grown significantly in the past 30 years. There was a huge wave of 57,000 alliances for US firms between 1996 and 2001 (Dyer, Kale, and Singh, 2004). World-wide, 20,000 alliances were formed between 1998 and 2000 (Anand and Khanna, 2000). According the Securities Data Corporation (SDC) Joint Ventures and Alliances database in 2005 there were over 52,000 completed or pending alliances reported. According to a 2009 study by KPMG International, the number of joint venture strategic alliances continued to grow in spite of the global financial crisis[1].

The volume of assets and revenue linked with alliances in mainstream business is also very significant. Before the year 2000, many of world's largest firms had over 20% of their assets and over 30% of their R&D budget tied up with alliances (Ernst, 2004; Kale and Singh, 2009). In the 2007-08 financial year, more than 80% of Fortune 1000 CEOs believed that alliances would account for 26% of their companies' revenues (Kale, Singh, and Bell, 2009; Kale and Singh, 2009). In sum, as a way of doing business, alliances are here to stay for sometime into the future.

2.3 Why do firms form alliances?

Some commonly cited motives why firms form alliances include: strengthening their competitive position through combined market power (Kogut, 1991); increasing scale efficiencies through reduced transaction costs (Hennart, 1988; Ahuja, 2000); gaining access to new and critical resources and capabilities (Hitt et al, 2000; Rothaermel and Boeker, 2008); accessing new technologies and innovative know-how of partners (Hamel, 1991; Vanhaverbeke, Duysters, and Noorderhaven, 2002);

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[1] This may be due to the sample of executives surveyed. In my own research conducted using SDC Platinum data, there was a significant drop in the number of alliances from 2008 onward.

responding to strategic resource inter-dependence between partners (Gulati, 1998); lowering the risk of entering new markets for the first time (Inkpen and Beamish, 1997; Garcia-Canal, Duarte, Criado, and Llaneza, 2002); trust and repeated ties (Gulati, 1995); complementarity of resource bases (Lin, Yang, and Arya, 2009); etc.

Other reasons why firms may form alliances include: following the momentum created from successfully forming previous alliances (Dyer, Kale, and Singh, 2004); taking advantage of the resources available through the rich industry network (Mitsuhashi and Greve, 2009; Ahuja, Polidoro, and Mitchell, 2009); perceptions of fairness of between firms negotiating an alliance (Ariño and Ring, 2010); and the relative status of firms within the industry or alliance network (Lin, Yang, and Arya, 2009).

Rothaermel and Boeker (2008) provide a good summary of different motives for alliance formation in the introductory section of their paper with the requisite citations to the literature.

2.4 Do alliances create value? How is it shared?

On average, the formation of alliances creates value for the partners' stock holders, albeit in the short-term (McConnell and Nantell, 1985; Chan, Kensinger, Keown, and Martin, 1997; Anand and Khanna, 2000). There is a positive correlation between the short-term performance measured by stock market reaction to alliance announcements and the long-term performance measured by alliance managers' assessments of success (Kale, Dyer, and Singh, 2002).

Alliance value creation depends on the experience firms gain from forming alliances and the type of alliance contract written (Anand and Khanna, 2000). For example, experience in joint ventures creates more value than more experience in

licensing agreements. Furthermore, Anand and Khanna found that more experience in joint ventures that involved research and production showed stronger learning effects than those of marketing joint ventures. However there are conflicting results about the effect of partner-specific experience on alliance value creation. While Hoang and Rothermael (2005) find partner-specific experience or repeated alliances with the same partner to negatively value creation, Zollo, Reuer, and Singh (2002) and Gulati, Lavie, and Singh (2009) found it to have a significantly positive effect.

Asymmetries in sharing of value created from alliances depend on the position in the value chain and the resource dependency between partners (Dyer, Singh, and Kale, 2008). Partners of horizontal joint ventures tend to share equally the synergy gains, while suppliers of vertical joint ventures tend to gain significantly more than buyers (Johnson and Houston, 2000). Kumar (2010a) found that partners with a strong resource dependency on the other joint venture partner experienced lower gains than the less dependent partner. This finding agrees with other research (Adegbesan and Higgins, 2011; Inkpen and Beamish, 1997) which shows that asymmetries in sharing of value created depend also on the bargaining positions in terms of the partners' mutual resource dependency. Other factors that drive asymmetric gains include differences in the firms' ability to learn and benefit from that learning (Hamel, 1991) and differences in information access by parent firms (Reuer and Koza, 2000).

2.5 Do alliances fail? How often? Why are they unstable?

Despite the fact that alliances on average create value, more than half of them fail (Kale and Singh, 2009). In fact, different studies have estimated the failure rate to be anywhere between 30% and 70%, where failure is defined as either not meeting the goals set by the parent firms, or not delivering the operational or strategic benefits they

were designed to achieve (Bamford, Gomes-Casseres, and Robinson, 2004). Alliances are particularly prone to failure in their earlier years following formation (Kogut, 1989; Bleeke and Ernst, 1993).

International alliances are more instable because of the significant coordination costs, cultural and language differences, difficulties reconciling conflicting goals with between independently owned partners, and always the threat of creating a competitor (Porter, 1990; Inkpen and Beamish, 1997; Peng and Shenkar, 2002; Fang, 2011). They too are known for their 50% failure rates (Bleeke and Ernst, 1993; Kogut, 1988).

Alliances, both domestic and international, often fail because of poor partner selection which later results in a mismatch of resources and insignificant synergy gains (Hitt et al, 2000). Failure can also be due to poor management of the alliance which fails to effectively build social capital that maximizes the trust between partners and to properly develop its learning systems within the alliance (Ireland, Hitt, and Vaidyanath, 2002). Competitive rivalry between partners may also cause alliance failure (Kogut, 1989; Dussauge, Garrette, and Mitchell, 2000). While reducing competitive rivalry may have been an initial reason allying firms decided to cooperate, the same competitive forces may later drive them to take advantage of each other.

In general, the failure of or challenges in forming and managing alliances can be understood in terms of the internal tensions between the partners. Specifically, three key dimensions include: cooperation vs. competition, rigidity vs. flexibility, short-term vs. long-term orientation (Das and Teng, 2000a). These internal tensions are feedback mechanisms that force the partners to engage in the renegotiation of the alliance contract or to modify their behavior to restore balance to the relationship (Ariño and de la Torre, 1998). Coupled with the tensions caused by the simultaneous changes in the

external business environment, the alliance relationship is co-evolves in tandem, adding

further to the instability (Doz, 1996; Das and Teng, 2002).

2.6 Which one? Alliance or Acquisition?

Combining resources through an alliance or acquisition are potentially but not perfect substitutes (Yin and Shanley, 2008). Acquisitions are competitive processes and involve the displacement of the target firm's management. Alliances on the other hand are cooperative and require on-going dealings with the partner's management (Dyer, Kale, and Singh, 2004). Choosing between engaging in one or the other requires firms to analyze at least three factors including: (1) the resources and synergies desired; (2) the market place they compete in; and (3) their ability to collaborate with partner firm (Dyer, Kale, and Singh, 2004: 110). However, firms may have a pre-specified preference to engage in one governance form over another because of certain characteristics of the firm itself rather than characteristics of the deal or partner/target (Villalonga and McGahan, 2005).

Firms which are more likely to engage in an acquisition have similar resource bases to the target and more prior acquisition experience, while firms more likely to engage in an alliance will be ones that have complementary resource bases with the target and more prior alliance experience (Wang and Zajac, 2007). Furthermore the decision a firm makes to ally or acquirer is taken in view of its overall position the network of firms it has relationships with rather than as if it was independent of these influences (Yang, Lin, and Lin, 2010).

Firms may also engage in an alliance with the intention of investing in an option to later acquire their partner (Kogut, 1991; Chi, 2000). Gaining partner-specific alliance experience with a target before acquiring it is one way firms use to reduce information

asymmetries before engaging in an acquisition (Agarwal, Anand, and Croson, 2006; Zaheer, Hernandez, and Banerjee, 2010; Porrini, 2004).

3.   A REVIEW OF LITERATURE IN STRATEGY & VALUATION

3.1 Theories from the Strategy Literature

The following sections provide brief summaries of different theoretical views of the firm that are found in the strategy literature. It is in no way complete. The idea is to highlight relevant parts of theories that provide insight into strategic alliances and their financial valuation. The four following sub-sections include: the market-based view, resource-based view, knowledge-based view, and transaction cost approach.

3.1.1   Market Based View

The market-based view (MBV) is an outside perspective of the firm and concerns how they position themselves in the market or industry in order to profitably compete (Makhija, 2003). Originating from early industrial organization theory (see Bain, 1950, 1956; Mason, 1964), MBV describes how firms affect long-term profitability by erecting entry barriers to increase monopoly power over customers and bargaining power over suppliers (Grant, 1991). Erecting entry barriers to prevent new industry entrants include concepts such as developing: greater economies of scale, finer product market differentiation, higher capital resource requirements, lower cost advantages, more complex proprietary knowledge, more exclusive access to distribution channels, and lobbying for government policy that discriminates against competitors which don't meet certain standards (Bain, 1956; Porter, 1979a). MBV is based on two assumptions (1) that entry barriers provide *common and equal* protection to all

incumbent firms, conferring some degree of monopoly or oligopoly power; and (2) that firm resources are homogeneous and hence relatively transferrable between incumbent firms, i.e. *mobile resources*. This version of MBV, however, cannot explain why over the long-term in the same industry different firms or groups of firms can co-exist each pursuing different strategies while at same time earning different profit margins.

To explain this mutual but differential co-existence requires extending MBV to include concepts such as strategic groups and mobility barriers (see Porter, 1979b; Caves and Porter, 1978). It is worth summarizing these concepts in more detail because of the similarities and relevance in respect to strategic alliances and valuation. As Porter (1979b) and Caves and Porter (1977) explain, an industry consists of multiple *strategic groups* which are groups of firms following a similar strategy that identifies the group. Each strategic group erects its own set of entry barriers *to prevent the mobility* of new rival groups entering the industry (inter-industry mobility), as well as *to deter the mobility* of other strategic groups within the industry entering their territory (inter-group mobility). Strategic groups with high mobility entry barriers are relatively more insulated from competitive rivalry within the industry, have superior bargaining power over other strategic groups within and without the industry, and have less threat from substitutes. Thus the distribution of profitability rates enjoyed by individual firms will depend on two structural influences: (1) *the structural nature of the firm's industry relative to other industries*: the greater the bargaining power the firm's industry has over its buyer or supplier industries, the more profitable will be the industry as a whole. And (2) *the structural nature of the firm's strategic group relative to other strategic groups*: the higher the mobility barriers of the strategic group, the greater will be the group's share of the industry profits. Mobility barriers include investments in

advertising, R&D, or building an in-house service capability (Porter, 1979b: 217), which while costly in the short-run protect long-run profits.

The presence of multiple strategic groups in an industry, Porter (1979b: 217-18) goes on to explain, affects the nature of inter-firm rivalry and hence the average level and dispersion of profits enjoyed by industry participants under the basic rule that *the greater rivalry, the lower the profits*. Three factors affect the competitive rivalry between strategic groups: (1) number and size distribution: the more groups and the more they are equal in size, the greater will be the rivalry; (2) strategic distance: the more similar they are in strategy, the more will be the rivalry. Strategic distance can be described in terms of advertising, cost structure, R&D, etc.; and (3) market interdependence: the more they share the same customers from the same market segment, the greater the rivalry.

Porter (1979a; 1985) summarizes the principle concepts of MBV in his celebrated five-forces model which includes: (i) threats of new entrants, (ii) threats from substitutes, (iii) bargaining power of suppliers, (iv) bargaining power of customers, and (v) industry rivalry. The model can be applied at either the firm or industry levels (i.e. inter-firm and inter-group rivalry). Under MBV, the role of management is therefore to assess the industry environment and to position the firm in attractive market segments according to three generic competitive strategies: (a) low cost strategy in which it can take high market share; (b) differentiation strategy in which it tries to dominate in a certain number of segments; or (c) niche strategy in which it aims for high margins in selected segments (Porter, 1985).

While MBV is an external view of the firm from the industry or market level, Porter recognizes the importance of the structure and organization within firms. His widely known *value-chain* (Porter, 1985) divides the firm into primary or line activities

and secondary or support activities. The ability for the firm to effectively manage the linkages between these activities is a source of competitive advantage that positively affects the profit margins the firm is able to make from customers above its competitors.

Application to alliances: MBV would therefore argue that strategic alliances of same-industry firms are motivated to cooperate (i.e. collude) in order to achieve at least one of three main objectives (Grant, 1991; Makhija, 2003): (1) to increase market power or strengthen market position against other competing firms or alliances; (2) raise higher entry barriers to prevent new rival firms or alliances from entering the market segment; or (3) to increase bargaining power against common suppliers and customers of the alliance partners. MBV would further argue that the formation of strategic alliances dynamically changes the structure of market power of the industry as competing alliances (i.e. strategic groups) change their mobility barriers with respect to each other. If the formation of alliances consolidates the industry into a fewer number of alliances, industry rivalry should decrease, positively affecting profit margins. If the number of alliances increases, the opposite effect would be observed. Furthermore, Porter (1979b: 217) would argue that the strength of monopoly or oligopoly power enjoyed by alliance firms is a function of the unity of strategy amongst the allying firms. However, divergent strategies amongst allying firms reduces this power with a concomitant decrease in margins because of increased difficulty in tacit coordination between partnering firms and decreased information flow through common customers.

But not all alliances which may seem motivated by collusion are contrary to public welfare, even among firms of a concentrated industry. As Kogut (1988: 322) points out "Where there are strong network externalities, such as in technological compatibility of communication services, joint R&D of standards can result in lower

prices and improved quality in the final market. Research joint ventures which avoid costly duplication among firms but still preserve downstream competition can similarly be shown to be welfare-improving." Other studies do show however, that alliances are motivated by market positioning motives. Vickers (1985) shows that firms may sometimes use joint ventures to pre-emptively patent small technological innovations as deterrents against new market entrants. Mathews (2006) shows using a simple model of Cournot competition how an incumbent deters an entrepreneurial firm from market entry by selling equity in his firm.

3.1.2 Resource Based View

In contrast to MBV, the resource-based view (RBV) is an inside perspective of the firm and concerns how a firm combines its strategically important resources using the capabilities it has developed to compete profitably against other firms (see Barney, 1991; Grant, 1991; Peteraf, 1993; Prahalad and Hamel, 1990). The origins of RBV stem from the work of Penrose (1959) who observed that strategic resource heterogeneity between firms was a source of earning sustainable Ricardian rents, i.e. firms with superior resources have lower average costs than other firms (Peteraf, 1993) and that the asymmetry of resource positions leads to the sustainability of above-average rents (Amit and Schoemaker, 1993). Following Penrose's work, RBV rose from a certain "dissatisfaction with the static, equilibrium framework industrial organization economics that [had] dominated much of contemporary thinking about business strategy" (Grant, 1991: 114). It began to emerge in the 1980s as an alternative explanation for the competitive strategies of firms (Wernerfelt, 1984; Barney, 1986). Rather than focusing on the competitive position of a firm in the market, "managers

should instead [be focusing] their analysis on their unique skills and resources" (Dierickx and Cool, 1989: 1504).

Unlike MBV which views strategic firm resources as homogeneous and mobile between firms of the same strategic group (i.e. easily transferrable), RBV conceptualizes each firm as a bundle of heterogeneous strategic resources that are generally not easily transferrable between firms (Barney, 1991) and therefore are not usually traded in strategic factor markets (Barney, 1986). Firms can develop a sustained competitive advantage and achieve superior profitability if they have access to strategic resources that possess four important attributes: (a) *valuable*, (b) *rare*, (c) *non-imitable*, and (d) *non-substitutable* (Barney, 1991). However, competitive advantage is not achieved merely by combining strategic resources, but requires a careful system of coordination and control across an entire firm which in turn fits the firm's corporate strategy (Collis and Montgomery, 1998).

Scholars have put forward various classifications of a firm's strategic resources. Grant (1991) provides six major categories of resources: financial, physical, human, technological, reputational, and organizational resources. Barney (1991) groups resources into three categories: physical capital, human capital, and organizational capital.

As strategic resources are generally not traded in strategic factor markets, to access new ones firms either need to develop them internally or combine theirs with those of other firms (Wernerfelt, 1984; Dierickx and Cool, 1989). The internal accumulation of a strategic resource, however, requires choosing appropriate time paths of flow variables to build the resource stocks (Dierickx and Cool, 1989), i.e. a firm builds a strategic resource through a deliberate and consistent policy of acting which requires time and constant effort. Dierickx and Cool (1989: 1507-09) distinguish

between stocks and flows of assets or strategic resources. The term "stock" refers to the level of asset accumulation, while flow refers to the rate of accumulation. These authors also identify several characteristics of the process of accumulating stocks of strategic resources: (1) *time decompression economies*: certain resources take a minimum time to build and shorting the process leads to diseconomies or lower quality stock; (2) *asset mass efficiencies*: a minimum stock of existing resources is required to build new ones efficiently, i.e. "success is needed to breed success"; (3) *asset interconnectedness*: the growth in stock of one asset may also depend on the level of stock of other assets, i.e. growth interdependencies; (4) *asset erosion*: the strategic value of resource stocks decrease over time and certain "maintenance costs" need to be paid to keep them from decaying excessively; (5) *causal ambiguity*: the direction of resource accumulation is not a linear process, and depends on current levels of stock and on factors that are beyond the firm's control or simply random; and (6) *asset substitution*: stocks of strategic resources can be substituted by other resources. These characteristics do not apply to all resources, but to those of a strategic nature.

Application to alliances: If a firm cannot overcome the stock and flow process limitations required to build its own strategic resources, it will need to resort to strategic alliances and acquisitions in order to remain competitive. While these forms of business combinations may help the firm catch up or overtake its competitors by "leap-frogging" certain requirements of the resource building process, for example jumping over the time diseconomies required to build a minimum asset base, it may still be limited by the other requirements, such as managing the interdependencies between its existing asset base and the assets to be combined. Firms that have developed a capability to combine resources accessed through a strategic alliance or acquired through an acquisition are

therefore at a distinct advantage (Kogut and Zander, 1992; Bresman, Birkinshaw, and Nobel, 1999; Hamel, 1991). The ability to learn as an organization is itself a strategic firm resource (Grant, 1991; Kogut and Zander, 1993)

3.1.3   Knowledge Based View: Organizational Learning and Capabilities

The study of organizational learning and how firms develop organizational capabilities has emerged from the knowledge-based view (KBV) of firms, an important extension of RBV. Under KBV, the firm is conceived as an organizational structure through which knowledge is created (Nonaka, 1991, 1994).

Knowledge is a special type of firm resource that has been categorized into two types: (A) *tacit knowledge* and (B) *explicit knowledge* (Nonaka, 1994; Grant, 1996b). The categories can be further analyzed according to three important characteristics (Grant, 1996b): (1) *transferability*: explicit knowledge is transferred as soon as it is revealed because it can be codified in a common format or language that others can read and interpret, for example: statistics, lists, tables, descriptions, etc. Tacit knowledge, in contrast, is "sticky" because it stays with the knowledge owner and transferred to the learner only if it is constantly practices by use and experience. It is not easily codified or expressed in a standard language; (2) *aggregability*: While explicit knowledge because of its common format can be easily stored and transferred in limitless quantities, tacit knowledge resides with the knowledge owner and is not easily duplicated or imitated; (3) *appropriability*: refers to ability of the resource owner to receive a return equal to the value created by the resource (Teece, 1987). While explicit knowledge becomes a public good (i.e. has low marginal cost) and loses its appropriability as soon as it is revealed, tacit knowledge increases in appropriability because its non-transferability and

non-aggregability make it a rare and valuable good. In sum, tacit knowledge is a strategic resource, while explicit knowledge is not and quickly loses value.

Tacit knowledge is more easily transferred if the learner already has a base of similar knowledge, i.e. has absorptive capacity (Cohen and Levinthal, 1990). *Absorptive capacity* is firm's ability to value, assimilate, and utilize new external knowledge and is critical to its innovative capability and sustainable competitive advantage (Zahra and George, 2002). The development of absorptive capacity is history- or path-dependent and the failure of a firm to continue investing in its development, especially in fast-pace and research intense industries, may foreclose future opportunities for absorptive capacity development (Cohen and Levinthal, 1990; Dierickx and Cool, 1989). While absorptive capacity is a firm-level resource, it can also be conceptualized as an interfirm-level resource called relative absorptive capacity (Lane and Lubatkin, 1998). *Relative absorptive capacity* is based on the dyadic relationship between two firms, for example in a strategic alliance, and depends on the similarity between firms' knowledge bases, organizational structures and policies, and business strategy.

Application to alliances: Firms are able to access each others' tacit knowledge resources through strategic alliances (Inkpen, 1998b; Stuart, 2000; Gomes-Casseres, Hagedoorn, and Jaffe, 2006). Value creation through strategic alliances is enhanced because the tacit knowledge resources of each allying firm are imperfectly mobile (not easily transferred), imperfectly imitable, and imperfectly substitutable (Das and Teng, 2000b; Grant and Baden-Fuller, 2004). Furthermore, as firms share their tacit knowledge resources, they tend to become more specialized in their area of knowledge expertise (Mowrey, Oxley, and Silverman, 1996). Specialization in knowledge creation allows allying firms to prosper in competitive environments by allowing each one, on

the one hand, to focus efforts on creation of its specialized knowledge while on the other, to access their alliance partners' specialized knowledge and integrate it with their own (Grant and Baden-Fuller, 1995, 2004).[2]

Firms also learn how to learn as they gain experience in strategic alliances (Anand and Khanna, 2000). They internalize this ability by setting up intra- and inter-organizational routines to increase the efficiency and effectiveness with which the knowledge is accessed and transferred, positively affecting performance of the alliance (Inkpen, 2000; Zollo, Reuer, and Singh, 2002). Firms also learn from their repeated alliances with the same partner (Gulati, 1995), as well as learn from their alliance failures (Ariño and de la Torre, 1998). Repeated alliances with the same partner, however, in general lead to deterioration in the value created (Goerzen, 2007).

Organizational routines are patterns of behavior that are followed repeatedly, but change if conditions change (Nelson and Winter, 1982; Dyer and Singh, 1998). In markets that are moderately stable, organizational routines are internal firm processes that are complex, detailed, and analytic and that produce predictable outcomes (Eisenhardt and Martin, 2000: 1106; Cyert and March, 1963; Nelson and Winter, 1982). Because of their tacit nature, organizational routines can become a source of competitive advantage (Grant, 1996a; Dyer and Singh, 1998). For example, Dyer and Hatch (2006) found a significant performance difference between auto manufacturers that used the same supplier network. Whereas Toyota established greater knowledge sharing routines with the common supplier network, resulting in faster learning and lower defect rates, US auto manufactures shared much less knowledge with this same supplier network, which learned slower and had a higher rate of defects, *ceteris paribus*.

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[2] While transfer of tacit knowledge through an alliance is more efficient than market exchange contracts, transfer of tacit knowledge within a (multinational) firm itself is still more efficient than across an alliance (Almeida, Song, and Grant, 2002).

However, in high-velocity markets where industry structure is blurred and emergent, firms learn how to agilely adapt their organizational routines into flexible modes of operating, converting them into *dynamic capabilities* (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000; Helfat et al, 2007). Under these market conditions, dynamic capabilities are processes that are simple, experimental, and unstable and that produce unpredictable outcomes. Dynamic capabilities are a subset of organizational routines that include product innovation, strategic decision making, and alliancing, and a further source of sustainable competitive advantage (Eisenhardt and Martin, 2000: 1111). Operating routines are another subset of organizational routines that are geared to the normal or stable operation of the firm. While operating routines are directed at the firm's operations, dynamic capabilities are directed at the *modification* of operating routines (Zollo and Winter, 2002: 340).

As firms learn to learn from their alliance experience, they develop *alliance capability* (Kale and Singh, 2007; Kale, Dyer, and Singh, 2002; Simonin, 1997). Alliance capability consists of how firm is able to coordinate, communicate with, and integrate or bond an individual alliance into a firm's network of alliances (Schreiner, Kale, and Corsten, 2009). One of the key success factors for firms to build alliance capability is setting up a dedicated alliance function. The alliance function plays the role of articulating, codifying, sharing, and internalizing the organizational routines of alliance management that make up the firm's alliance capability (Kale and Singh, 2007; Heimeriks and Duysters, 2007).

3.1.4   Transaction Cost Approach

The transaction cost approach has its origins in a classic paper on "The nature of the firm" by Coase (1937) who observed that goods and services produced by firms are

the product of early stage processing and assembly of activities (Williamson, 1981: 550). The basic idea of the approach is that firms purchase production inputs based on minimizing the sum of the production and transaction costs. Transaction costs include "the costs of negotiation, drawing up contracts, managing the necessary logistics, and monitoring the accounts receivables" (Child and Faulkner, 1998: 20). Furthermore, firms will choose an organizational form that enables them to access or purchase their production inputs at the lowest transaction cost (Williamson, 1979). These forms include, at one extreme market exchange contracts, at the other extreme mergers or acquisitions of suppliers, or a middle-ground hybrid form such as alliances, including licensing contracts to joint ventures.

Three critical dimensions of the transaction to acquire inputs determine a firm's preferred organizational form: (1) frequency of transactions; (2) uncertainty of acquiring inputs; and (3) asset specificity involved in input production and supply (Williamson (1975, 1979, 1985). The second and third are the two most critical dimensions (Williamson, 1991; Hennart, 1988; Dyer and Singh, 1998; Amit and Schoemaker, 1993). Market uncertainty incurs transaction costs involved with performance monitoring, while asset specificity incurs transaction costs that concern acquiring inputs at stable prices (Kogut, 1988; Hennart, 1988).

Application to alliances: Kogut (1988: 321) explains how uncertainty makes equity joint ventures (alliances) the preferred organizational form: two or more firms vertically contiguous in the supply chain will choose an alliance over other organizational forms when uncertainties exist over downstream demand or upstream supply. The supplier's transaction cost involves monitoring the quality of the buyer's market information about downstream conditions, the buyer's cost is monitoring the quality and timely delivery of

the supplier's inputs, and both will incur price negotiation costs. The uncertainties over the general market conditions amplify the monitoring costs for both firms. Under these uncertain conditions, a market exchange contract would not be the preferred organizational form. A merger of firms, on the other hand, would also be excluded because again uncertainty over market conditions demands flexibility in the organizational relationship. An alliance provides this flexibility in conditions of uncertainty and at the same time introduces a *mutual hostage* situation through the joint commitment of financial and real assets that aligns their incentives and reduces the associated transaction costs of monitoring and negotiating the transaction of inputs and market information.

Hennart (1988: 371) explains in a different way why an equity joint venture (alliance) would be preferred when resources with high asset-specificity are involved. Such resources require large investments over an extended period of time and include tacit knowledge assets that are not readily marketable or physical assets with high operating leverage[3]. Again, take two firms in vertically contiguous positions in the supply chain. The downstream firm needs inputs from the upstream but a market exchange contract for the inputs it needs don't exist; developing its own source of inputs is prohibitively expensive in terms of development costs and time; and acquiring the upstream firm for the sake of accessing its inputs introduces other transaction costs that complicate its problem such as managing a new business and displacing the old management. For the upstream firm, acquiring the downstream to ensure a buyer again incurs management transaction costs; and the downstream firm's required input volume may not match its current output. An alliance such as an equity joint venture between

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[3] Operating leverage can be thought of as the ratio of fixed costs to variable costs. Firms with high operating leverage make large upfront investments and need large sales volume to break even. Each dollar of sales contains a high percentage of profit because the variable or marginal costs of production are relatively small or almost negligible. For example, an airline operator would have high operating leverage compared with a supermarket chain.

the two firms however, will avoid many of these transaction costs. The upstream alliance partner can produce the inputs at low or negligible marginal cost, while the downstream partner can obtain the inputs at a lower total cost compared to producing the inputs itself. The incentives of the alliances align their cost structures.

In sum, the transaction cost approach provides insights into the economic incentives that drive firms to choose certain organizational forms over others by focusing at the level of the transaction between firms. The approach is not an alternative to MBV, RBV, or KBV. In fact all these theoretical views should be seen as complementary explanations (Kogut, 1988: 322).

3.2 Theories from the Financial Valuation Literature

"A valuation is just an opinion" (Fernández, 2009: 8). Value should not be confused with price, which is the quantity of money agreed between a buyer and seller to exchange goods or services (Fernández, 2002). Value, on the other hand, is a subjective judgment that depends on how important the good in question is to the buyer or seller. A good may be more valuable to one buyer than another. Thus the *valuation* made by a single investor on a firm's traded stock is contingent on his or her expectations of the future and on the risk assessment of the firm (Fernández and Bilan, 2007). The traded *price* for that stock, however, is the consensus of valuations made by market participants who publicly manifest their opinion by buying or selling that stock.

The assessment and measurement of synergies are of fundamental importance to valuation for any form of business resource combination such as an alliance or M&A. In finance, there are two main sets of synergies, especially in case of mergers: operating synergies and financial synergies (Damodaran, 2005, 2012). *Operating synergies* include (1) greater economies of scale because of larger size with the same fixed; (2)

increased pricing power because of reduced competition and ability to earn higher margins; (3) complementary functional strength brought by combining the best practices of firms; and (4) increased sales in new or existing markets because of extended sales network and complementary brand recognition. *Financial synergies* from the merger of two firms include (1) increased debt capacity and hence lower cost of debt capital because combining uncorrelated operating cash flows reduces their overall volatility; (2) increased tax benefits especially if one of the firms has accumulated tax losses that can be used to reduce the combined firm's tax burden; (3) diversification which reduces the overall cash flow volatility of the portfolio of firms, although this synergy is usually only valid for privately held firms; and (4) cheaper access to project capital, especially a capital constrained firm with good projects is acquired by another with excess cash, thus avoiding to go to the capital markets. Both types of synergies, if they are realized, show up in the valuation as increased cash flows or lower discount rates (Damodaran, 2005).

While the valuation of M&As depend to a great degree on the assumptions upon which they are based, valuing alliances has the added difficulty of defining the limits to firm boundaries. As alliance partners commit to share both tangible and intangible resources without legally merging as one entity, the boundary between them is blurred making it difficult to accrue value created to one party or the other. A firm's bargaining power against its alliance partner will determine to a great extent the portion of the total value pie created (Adegbesan and Higgins, 2011; Adegbesan, 2009).

The following section provides a summary of theories and methods that could be used to value the wealth creation of strategic alliances. However, the purpose of the summary is *not* to provide a comprehensive coverage of the available theories or methods in the finance literature, but rather to highlight certain issues that could be

related to valuing strategic alliances within the context of this paper. For proper treatment of the methods mentioned, please refer to the references provided.

3.2.1   Discounted cash flow method

The discounted cash flow (DCF) method of valuation is the finance "gold standard" for both firm and project valuation. The basic economic intuition is that the present value of a stream of cash flows (PV_0) is the sum of the discounted value of those cash flows (CF) each discounted by a rate (k), as shown in equation (1). The term "cash flow" refers to the "future net cash in-flow" i.e., the difference between cash received and cash paid out within each time period in the future. The discount rate is usually simplified so that $k_1 = k_2 = \ldots = k$ and depends on the risk of receiving the cash flows: if the risk is low then the cash flows are discounted at a lower rate; if the risk is high, then a higher discount rate. The net present value (NPV) is the remaining economic value after making the investment (I_0) today in order to receive the cash flows, as shown in equation (2).

$$PV_0 = \frac{CF_1}{1+k_1} + \frac{CF_2}{(1+k_2)^2} + \frac{CF_3}{(1+k_3)^3} + \ldots = \frac{CF_1}{1+k} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \ldots \qquad (1)$$

$$NPV_0 = PV_0 - I_0 \qquad (2)$$

DCF is easy to apply once the cash flows and discount rate have been determined. However, the differences in the assumptions used to calculate these values are where the difficulties lie. Determining the value of cash flows requires assessing and measuring the operational and financial synergies outlined above, tasks that depend to a great degree on the assumptions made. Calculating the discount rate also requires tacit know-how on forecasting market interest rates, industry risks, and the systematic risk of the firm. Understandably, these are all non-trivial tasks.

There are many "flavors" of DCF depending on whether one is valuing a firm or project, a firm that is stable, growing or in decline, a high-technology or standard technology firm, whether the firm has debt or is all equity funded, etc. Fernández (2002: 38) gives three basic methods of DCF[4]: (1) *FCF method*: Free cash flows (FCF) discounted by the weighted average cost of capital (WACC) of the firm. Free cash flows are defined as the after-tax surplus cash generated by a firm's operations (or project) regardless of any financing costs, and is a measure of a firm's ability to make money regardless of where it got its capital from; (2) *CFe method*: Equity cash flows discounted by the required return to equity holders, k_e; and (3) *CFd method*: Debt cash flows discounted by the required return to debt holders, k_d. A more comprehensive treatment of the different methods of DCF is given in Fernández (2005a).

The FCF method (see Brealey, Myers, and Allen, 2008) enables the calculation of the total value of the firm or project (V_{FCF}). Theoretically (i.e. in the absence of market inefficiencies and financial distress costs), the total value of the firm[5] (or project) equals the market value of the equity (E) and the market value of debt (D) issued by the firm, as in equation (3).

$$V_{FCF} = E + D = PV(FCF, WACC) \tag{3}$$
where PV(FCF, k) is the DCF operator given by equation (1)

$$\text{and } NPV_{FCF} = V_{FCF} - I_0 \tag{3a}$$
$$\text{where } WACC = [Ek_e + (1-T)Dk_d] / [E+D] \tag{3b}$$
and T=firm's marginal tax rate.

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[4] There are of course many more! See for example Copeland et al (2000) and Brealey et al (2008).
[5] Another name for the value of the firm is enterprise value.

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The FCF method, however, assumes that the capital structure of the firm (debt to equity ratio) remains constant, which may not always be the case unless the firm continuously rebalances its financing structure[6].

A useful extension of the DCF method is the Adjusted Present Value (APV) method, which does not assume a constant capital structure. The intuition to APV is that the value of the firm or project (V_{APV}) is equal to the sum of the value generated by the unlevered firm or project (V_u)[7] and the value generated by the tax benefits due to debt[8], as in equation (4). APV is a particularly useful method for project valuation as project value should not depend on the source of financing for the project, but rather only on the cash flows it generates and the risk of the project with respect to the firm's risk.

$$V_{APV} = V_u + \text{Value of tax benefits due to debt} = V_{FCF} \qquad (4)$$

where $V_u = PV(FCF, k_u) = $ Unlevered value of firm or project

$$\text{and } NPV_{APV} = V_{APV} - I_0 \qquad (4a)$$

$$\text{and where } k_u = r_A = [Ek_e + Dk_d] / [E+D] \qquad (4b)$$

r_A is the expected return to assets[9]

k_u is the unlevered expected return to equity

k_e is the levered expected return to equity

$$\text{and } k_e = R_f + \beta(R_m - R_f) \rightarrow \text{CAPM} \qquad (4c)$$

where R_f is the risk free rate

R_m is the market risk premium

β is the systematic risk of the firm's stock.

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[6] This assumption is required to ensure no change in k_u or k_d such that WACC also remains constant.

[7] V_u means the value of the firm or project *as if it* was entirely funded by equity, i.e. no debt or unlevered.

[8] The equation states "value" of tax benefits due to debt and *not* "present value" as it does in Brealey et al (2008: 546). This point is argued in Fernández (2004, 2005b) and Fieten, et al (2005).

[9] This is also called the opportunity cost of capital and is the "simplest" formula to find k_u the unlevered expected return to equity (Brealey et al, 2008: 543). Note that, in this formula, k_e and k_d are observable values, where k_e is the levered return to equity, the return to equity when the firm also has debt financing.

Application to alliances: Strategic alliances can be considered joint projects between allying firms who share a subset of their resources. Equations (3) and (4) can be combined to give equations (5a) and (5b), one for each firm in the alliance, say firm A and firm B:

$$E_A + D_A = V_{uA} + V_{TDA} \qquad\qquad (5a)$$
$$E_B + D_B = V_{uB} + V_{TDB} \qquad\qquad (5b)$$

where V_{TD} = value of the tax benefits due to debt of firm A or B

If the risk of the alliance project is no different to the risk of the respective parent firms' risk and no new debt is issued, then there should be no change in the market value of debt and all the benefits of the project should go to the equity holders. However, if the project risk is different to the respective partner firms' risks, there may be change in the market value of debt.

Research has shown that firms tend to choose alliances as the organizational form through which they undertake projects that are more risky than their normal business risk (Contractor and Lorange, 1988; Robinson, 2008). Given this result, questions arise as to what the appropriate discount rate should be to value the expected cash flows from the alliance and the commensurate effect on capital structure of each allying firm. Further discussion on these questions is found in the section on Research Gaps.

3.2.2   Real options method

One disadvantage of the discounted cash flow method is it assumes that once the decision is made to accept or reject a project it will not be changed later on. In practice, managers do change their decisions as new information arrives that gives them a better indication of the future performance of the project. If the news is good, they may decide

to go ahead or even expand the project scope, while if it is bad, they may scale it back or even abandon it altogether. The option to choose based on future market conditions is therefore valuable. DCF methods, however, do not account for this strategic managerial flexibility. The real options methods do.

Myers (1977) first used the term *real option* to refer to the present value of the future assets a firm has the *discretion to invest in* depending on conditions of the market in later periods. He observed that "most firms are valued as going concerns, and this value reflects and expectation of continued future investment by the firm. However, the investment is discretionary. The amount invested depends on the net present values of opportunities as they arrive in the future. In unfavorable future states of nature, the firm will invest nothing." (p.148).

Some types of investment decisions a more suitable for using real options methods (Amram and Kulatilaka, 1999: 25-27) such as: (a) *irreversible investments*: large investments in fixed assets can be built in flexible stages or delayed until favorable times; (b) *flexibility investments*: designing manufacturing processes so that they can switch between several different products or uses; (c) *insurance investments*: when exposed to the risk of loss, paying an insurance premium provides protection in the event of a loss; (d) *modular investments*: stages of product design that can be upgraded or changed independently of other modules allows flexibility to meet future requirements; (e) *platform investments*: a technology platform, such as Apple's iOs operating system, allows many different yet to be designed products to be sold through the same platform; (f) *learning investments*: exploration of oil or minerals allows for future investments in oil production based on initial finding.

There are three main types of real options embedded in the investments made by firms (Damodaran, 2008: 235): (I) *option to expand* an investment; (II) *option to delay*

an investment; and (III) *option to abandon* an investment. Real options methods incorporate the flexibility of strategic managerial decision making into the valuation process using the theories of financial options (Black and Scholes, 1973).

In financial options, the buyer of a call option pays a premium for the right but not obligation to buy the underlying asset at a preset exercise price before the option expiry date. If the price of the underlying is below the exercise price at the time of expiry, the call option owner will obviously not exercise the option. Thus the option owner has downside protection from loss *as well as* upside opportunity for gain. In an analogous manner, the buyer of a put option buys right but not the obligation to sell the underlying asset at a preset exercise price if the price of the underlying falls below the exercise price before the option expires. Regardless of the type of option as long as it has not expired, an option always has positive value. The underlying asset can be any asset, including stocks, bonds, real estate, commodities, etc.

Table 1 presents the analogy between a financial American style call option and a real option to expand a project (See Hull, 2000; Damodaran, 2008)

Table 1: A comparison of a financial and real option to expand

Financial Call Option	*Symbol*	*Real Option to Expand*
Value of underlying asset e.g. a stock price	S	Estimated present value of project cash flows
Exercise price of call option	K	Cost of investment in expansion if option is exercised
Volatility of underlying asset e.g. std dev of stock price returns	σ	Standard deviation in project value, usually obtained by simulations
Time remaining to option expiry	T	Time remaining to decide before expiry of option to expand
Dividends of underlying asset	δ	Other income from the project.
Risk free rate	r	Risk free rate taken from government Treasury Bills

Application to alliances: Alliances can be understood as joint investments by the partnering firms in real options (Kogut, 1991; Chi, 2000; Folta and Miller, 2002). Although they are started as a joint project, changes in the market conditions may make

it favorable for one partner to buy out the other's share and expand the project under its own management. Alliance contracts may be designed with this buy out option included (see Reuer and Ariño, 2007). In a similar vein, in order to increase the number and value of their growth options, Reuer and Tong (2010) show that cash-rich firms will often use investments in alliances with new publicly-listed technology firms as a way of discovering new technologies and market opportunities that they would otherwise not have access to.

Alliance capability or capabilities in general can also be understood as a real option. Firms which have invested in strengthening their alliance learning routines by simplifying and making them more flexible especially in times of high market volatility will be more able to respond and take advantage of market upswings (Kogut and Kulatilaka, 2001).

Valuation of projects using real options methods, however, is not without difficulties. Once touted as a way of unifying strategic thinking with financial option methods (Kester, 1984; Bowman and Hurry, 1993), difficulties in customizing the reality to the financial models has limited its wider use (Bowman and Moskowitz, 2001). Nevertheless, as a way of thinking about projects, real options methods continue to provide a way forward for research (see Krychowski and Quélin, 2010)

3.2.3   Event study method

The discounted cash flow and real options methods require information inputs that come from the within the firm to evaluate expected performance of the firm or a project. Event study methods of evaluating firm performance however, rely solely on publicly available sources, namely corporate security prices. The purpose of an event study is to examine the market reaction reflected in corporate security prices to news of

firm-specific events such as earnings announcements or mergers (Brown and Warner, 1980, 1985). The methods assume that the market is efficient and that investors react quickly in consonance with the publicly available information about the event.

According to Kothari and Warner (2005), in the period 1974-2000 the five major finance journals published 565 studies that used the event study methods, and this number continues to grow. The vast majority of these studies examine corporate stock prices. They further note that many other studies that look specifically at the statistical properties of event studies. Much fewer studies, however, examine corporate bond prices mainly due to the lack of transparency in corporate bond markets until recently (Besseminder et al, 2009).

The basic approach is similar in all event studies methods, which is to calculate the abnormal returns[10] where "abnormal" is defined as the security return compared with some benchmark return. Three methods are used to calculate benchmark return and are summarized briefly in Table 2 (for stocks see Brown and Warner, 1980; for bonds see Besseminder, Kahle, Maxwell, and Xu, 2009)

Table 2: Basic methods of calculating abnormal returns for stocks and bonds

	Stocks *(see Brown and Warner, 1980)*	*Bonds* *(see Bessembinder et al, 2009)*
Mean adjusted	$AR_{it} = SR_{it} - E(SR_{it})$	$AR_{it} = (SR_{it} - TR_{it}) - E(SR_{it} - TR_{it})$
Market adjusted	$AR_{it} = SR_{it} - E(R_{mt})$	$AR_{it} = SR_{it} - MPR_{it}$
Factor model adjusted	$AR_{it} = SR_{it} - FMR_{it}$	$AR_{it} = SR_{it} - FFFMR_{it}$

i=security; t=event time; AR_{it} = abnormal return of security of i at time t; SR = security return; E(.) = mean or expected return in estimation period; R_{mt} = return on market portfolio at time t; TR = return of treasury security of matching maturity; MPR = Matching Portfolio Return for a portfolio of bonds with similar in credit rating and time to maturity; FMR = factor model return, where the factor model can be one of the CAPM models; FFFMR = Fama French factor model return, where Fama and French (1993) factor model is used as the benchmark.

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[10] The term *abnormal return* is used synonymously with *excess returns* or *excess residuals*.

The main disadvantage of the event study method is that it is only valid for short-term security performance. Improvements have been made to the event study methods for long-term horizons, but serious limitations still exist (see Kothari and Warner, 2005). A more thorough review of the event study method used in the finance and accounting literature can be found in Corrado (2011).

4.   A REVIEW STUDIES OF STRATEGIC ALLIANCE VALUE CREATION

There are many studies in both the finance and strategy literatures that examine the value creation effects of strategic alliance formation. The vast majority use the event study methodology to measure the short-term market reaction of announcements of alliances. In fact, in my review of the empirical literature, use of any other method was more the exception than the rule.

Table 3a: Selected key studies on the value creation of strategic alliances

Researchers	*Sample Period*	*Sample*	*Event window*	** = AR (day 0) /* *** = CAR (over event window)*
McConnell and Nantell (1985)	1972 – 1979	136 domestic US joint ventures (in various industries: real estate development, nuclear power, coal mining, petrochemical, satellite communication, others)	2 days (-1 / 0)	*0.73% all joint ventures *1.10% smaller partner *0.63% larger partner Dollar value gains smaller/ larger partner were \$4.5m / \$6.6m

Chan, Kensinger, Keown, and Martin (1997)	1983 – 1992	345 alliances
		   114 all public partners
		   231 only one public partner
		 (involving 460 firms, with 394 in hi-tech industries and 66 in low-tech industries)
			26 days (-20 / +5)	*0.64% all alliances
				 *2.22% smaller partner
				 *0.19% larger partner
				 Dollar value gains: Smaller/larger partner were \$8.9m / \$8.1m

Das, Sen, and Sengupta (1998)	1987 – 1991	119 US-Japanese alliances:
		   49 technology alliances
		   70 marketing alliances
			7 days (-3 / +3)	**0.20% all alliances
				 **1.6% technology alliances
				 **-0.8% marketing alliances

Anand and Khanna (2000)	1990 – 1993	1576 alliances:
		   870 joint ventures
		   1106 licensing agreements
			12 days (-10 / +1)	*0.67% / **1.82% JVs
				 *1.42% / **3.06% Licensing
				 Dollar value gains: JV / licensing deals were \$44.1m / \$20.4m

Kale, Dyer, and Singh (2002) Kale, Dyer, and Singh (2001)	1993 – 1997	1572 alliances reported by 78 companies with more than \$500m in 1997 in whose industries alliances are generally considered an important part of firm strategy (e.g. computers, telecomm., pharmaceuticals, chemicals, electronics, and services.)	14 days (-10 / +3)	*0.84% all alliances *1.35% with alliance function *0.18% without alliance function Dollar value gains: all/ with alliance function / without alliance function were \$58.3m / \$75.1m / \$20.2m
Reuer, Park, and Zollo (2002)	1995 - 1997	1318 international joint ventures	3 days (-1 / +1)	**-1.83% all joint ventures

Table 3b: Other studies on the value creation of strategic alliances

Koh and Venkatraman (1991) – study joint venture announcements and find they are in general value creating
Chung, Koford, and Lee (1993) – study international joint ventures and find a strong *negative* effect on value creation
Mohanram and Nanda (1996) – find value creation at the parent-level but not at the firm-level
Johnson and Houston (2000) – study the motives of joint ventures and find asymmetries in partners' value creation
Gupta and Misra (2000) – study effect of experience in international joint ventures and find it value creating for partners
Brooke and Oliver (2005) – study the source of gains for strategic alliances
Mantecon and Chatfield (2007) – compare value creation in short term market reaction with assets sales of terminating JVs
Kumar (2007; 2010a) – find asymmetric gains for the share holders of parents of joint venture partners.
Bösecke (2009) – study value creation in small European utilities and find significantly positive returns.
Keasler and Denning (2009) – large sample study confirms that strategic alliances on average create value
Gulati, Lavie, and Singh (2009) – study the effect of partner-specific experience on repeated alliances and find it significant
Sánchez-Lorda and García-Canal (2012) - study how equity investors value prior experience in alliances and acquisitions
Amici et al (2013) – study US and European banking sector alliances and find they create value for non-bank partners

Tables 3a and 3b provide summaries of a partial list this empirical literature. As noted by Kothari and Warner (2005), more than 500 papers in the top five finance journals alone have used the event study method.

Some conclusions that can be drawn from analyzing Tables 3a and 3b include the following:

- The most prevalent method for studying value creation from strategic alliance formation has been the event study method.

- Strategic alliances in general create value for their stock holders in the short-term.

- There are studies that show strong negative effects on value creation, although they are in the minority. These studies are of international joint ventures (Reuer, Park, and Zollo, 2002; Chung, Koford, and Lee, 1993)

- There are no event studies that examine the effect of strategic alliance formation on corporate bonds.

5.   RESEARCH GAPS AND AGENDA

After having reviewed the relevant parts of the literature, I identify below two research gaps that form my research agenda. As I have described in greater detail in the Introduction to this dissertation, the agenda aims at contributing to both finance and strategy with the intention of integrating these fields while also respecting their proper research traditions. This is not an easy task. I have thus taken a conservative approach which is to give a distinct "flavor" to each gap. Gap 1 has a notable strategy flavor and into which I subdivide in two parts: Gap 1a forms the focus of Paper Two of this dissertation and Gap 1b is an extension for future research. Gap 2 takes on a finance flavor and into which I also divide in two parts: Gap 2a is the focus of Paper Three, while Gap 2b is intended for future research work.

5.1 Gap 1a: Alliance experience effects on acquisition performance (Paper Two)

A great portion of the research that lies at the crossroad between strategic alliances and organizational learning focus on the performance of the focal organizations of the alliance in activities related to alliancing. That is, how a focal alliance affects the performance of a focal firm (e.g. Anand and Khanna, 2000; Kale, Dyer, and Singh, 2002), or performance of the focal alliance itself (e.g. Zollo, Reuer, and Singh, 2002; Hoang and Rothaermel, 2005), or the performance of the alliance portfolio in which the focal alliance is embedded (e.g. Lavie, 2006, 2007; Wassmer and Dussauge, 2012).

A new and growing stream of research concerns how strategic alliances and what firms learn from them affect other activities they do that are *not* directly related to alliancing, for example, acquisitions. As firms view both alliances and acquisitions as strategically alternative organizational forms (Wang and Zajac, 2007; Dyer, Kale, and

Singh, 2004), the organizational routines put in place and capabilities gained from engaging in the activities of one organizational form may be transferred to the other.

This raises an interesting set of questions that would be of interest to both scholars and practitioners in the areas of organizational learning and financial valuation, such as:

- Does transferring experience from one organizational form to another have a positive or negative effect on performance? i.e., does alliance experience positively or negatively affect acquisition performance, and vice versa?

- Is the transfer of experience and its affect on performance a bilateral transfer? i.e., does alliance experience have the same effect on acquisition performance as acquisition experience has on alliance performance?

- By what mechanism does the transfer of experience occur? Is it just one mechanism or are there multiple transfer mechanisms?

- Does the capability that firms develop to transfer experience from one organizational form explain the performance heterogeneity between similar firms?

Paper Two of this dissertation addresses some of these questions.

5.2 Gap 1b: Strategic alliances, absorptive capacity, and acquisition performance

Research Gap 1a identified above is a growing stream of research that has a dual focus on alliances and acquisitions. In support of conducting more research of this type, Shi, Sun, and Prescott (2012: 195) note the following:

> Given the fact that acquisition and alliance are two different yet complementary means of corporate strategy, there are surprisingly very few studies that consider both alliance and acquisition simultaneously ($n = 6$). This seems to be in contrast to business reality, where firms engage in acquisition and alliance initiatives simultaneously to address different resource or organizational needs.

While Paper Two showed that firms learn to develop cooperative capabilities that can be transferred to acquisitions, an interesting extension is how firms learn to develop absorptive capacity through their alliance experience that positively affects acquisition performance. Absorptive capacity is defined as a "dynamic capability pertaining to knowledge creation and utilization that enhances a firm's ability to gain and sustain a competitive advantage" (Zahra and George, 2002: 185).

The research idea proposed here is different to Wang and Zajac (2007) or Villalonga and McGahan (2005) which look at the *complementarity* of alternative governance forms. Instead, the research into this gap should endeavor to answer questions about *transferability* such as:

- Do firms deliberately engage in alliances with the intent of developing absorptive capacity in the industry of the alliance so that they can transfer what they learn to make acquisitions in that industry?

- Under what circumstances does the development of absorptive capacity in alliances lead to a more favorable transfer to acquisitions?

- Is the ability to transfer alliance experience to acquisitions a sustainable competitive advantage over industry rivals? i.e., are these firms more successful than their peers who have not developed such prior absorptive capacity through their alliances?

5.3 Gap 2a: Do strategic alliances create value for bond investors? (Paper Three)

Almost all the event studies that have examined the effect of alliance announcements on firm value have only examined the effect on stock holders' wealth. That no published study has examined the effect of alliances on bond holder wealth is indeed surprising. Especially given that bond holders are major investors in the firm,

and that the corporate bond market is three times the size of corporate equities market in terms of outstanding issues (Bessembinder and Maxwell, 2008).

In contributing to the literature to fill this gap, the research work should endeavor to answer questions such as the following:

- Do bond holders benefit from the formation of strategic alliances as do stock holders?

- If they do, is it because of a transfer of wealth from other (non-bond) investors of the firm? What about transfer of wealth from the partner firm?

- If indeed corporate bonds are positively affected by strategic alliance formation, how is this effect explained? Since corporate bonds are senior to corporate equities in case of bankruptcy, the theoretical mechanism by which corporate bond values are affected by strategic alliance formation should be different from that of equities.

- Are there certain situations in which bond holders are more affected than in other situations?

- Does organizational learning and alliance capability have a role in determining the value of debt?

Paper Three aims to fill this gap in the literature by answering some of the questions raised here.

5.4 Gap 2b: Strategic alliances, real options, and firm capital structure

When Myers (1977) first coined the term real options, he used it to explain a theory of corporate borrowing that has come to be known as the trade-off theory of firm capital structure (Brealey et al, 2008: 504). He argues that the value of a firm equals the

value of the firm's assets-in-place (AiP) and growth options (GO). The value of the firm is also the market value of debt and equity, hence equation (5):

$$D + E = V_{AiP} + V_{GO} \qquad (5)$$

He further argues that if the firm is already levered and issues more (risky) debt when it is already cash-constrained, a suboptimal future investment strategy is induced that reduces the present value of the firm. The sub-optimality arises when the firm in order to meet its increased debt obligations is forced to let expire unexercised some of its valuable growth options since exercising them means further investment and more cash constraints. Foreseeing this *ex post* abandonment of grow options, current stock holder wealth is reduced (i.e. to balance equation (5)). This explains to some extent, argues Myers, why firms do not borrow excessively and that there is an optimal capital structure that is determined by a trade-off between the tax benefits of debt and the opportunity cost due to lost growth options.

If strategic alliance formations do affect the value of corporate bonds, as Paper Three concludes, then there will be a direct effect on the total value of the firm and hence on the firm's capital structure. Research questions that arise as a consequence of this include:

- If debt affects capital structure of firms that form alliances, is the source of change in firm value and hence capital structure due only to changes in the value of growth options (V_{GO}) or is there also a role for changes in the value of assets in place (V_{AiP})? What effect do the assets that are shared in the alliance have on each of these values?

- Illustrating with the example of Merck, Brealey et al (2008) ask how and why some successful firms "survive and thrive at low debt ratios" (p. 500). Can the

growth options that are associated with alliances in technology intense industries such as biotechnology and pharmaceuticals help explain this capital structure question?

- When should these technology firms that frequently engage in alliances start to issue debt?

Some of these questions are further developed at the end of Paper Three and will form the basis of on-going research.

6. CONCLUSION

In this literature review I highlighted relevant theories and methods in the strategy and finance literature and applied them to help develop an understanding of strategic alliances from an organizational learning and valuation point of view. I then identified several research gaps for further study, two of which form the focus of Paper Two and Paper Three respectively for this doctoral dissertation.

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Paper Two:

Understanding Cross-form Transfer Effects: Alliance Experience and Acquisition Performance

ABSTRACT

We study the cross-form transfer effects between the alliance and acquisition governance forms. One particular case of the cross-form (transfer) effect is how previous alliance experiences of acquirers and targets affect acquisition performance. We extend the literature by providing a more integrated and nuanced explanation of the cross-form effect using two theoretical mechanisms. The first is the more familiar process similarities mechanism which explains the cross-form effect as the extent to which alliance processes in the same firm are transferred to acquisitions because of similarities between the processes involved in the two governance forms. We extend the literature by enriching the explanation of the cross-form effect with a second mechanism. The experience interactions mechanism explains the effect as the extent to which alliance processes from different firms have mutual influences on each other in the focal acquisition. By taking inter-firm and intra-firm perspectives, the two mechanisms provide complementary explanations of the overall cross-form effect and together form one integrated cross-form mechanism. Hypotheses derived from the theoretical mechanisms are tested on a sample of 505 US acquisitions between 1988 and 1997 in the manufacturing sector. We find strong empirical support for our main hypotheses on the cross-form mechanisms.

1. INTRODUCTION

Understanding how organizational experience affects performance falls at the heart of theories of organizational learning and strategic management (Levit and March, 1988; Kogut and Zander, 1992; Zollo and Winter, 2002). Prior research has tended to restrict the scope of study to the same organizational form, such as how prior acquisition experience affects acquisition performance (Haleblian and Finkelstein, 1999; Hayward, 2002; Beckman and Haunschild, 2002) or how prior alliance experience affects alliance performance (Zollo, Reuer, and Singh, 2002; Hoang and Rothaermel, 2005; Sampson, 2005). Broadening the scope of study, a new and growing area of research is the study of *cross-form (transfer) effects* (e.g., Zollo and Reuer, 2010; Zaheer, Hernandez, and Banerjee, 2010; Yang, Lin, and Peng, 2011; Agarwal, Anand, Berkovitz, and Croson, 2012), which is how experience gained in one governance form (alliances or acquisitions) affects performance in another. Given the relatively few studies that look simultaneously at both forms (Shi, Sun, and Prescott (2012: 195) count only six such studies), our understanding of cross-form effects is still rather limited.

Our research general question concerns understanding the effect of cooperative strategies learned from previous alliance experiences on focal acquisition performance. For this study we define this effect to be the cross-form effect. More specifically, we extend the literature by providing answers to two related sets of questions. Firstly, from an inter-firm perspective: Are there mutually influential effects between the previous alliance experiences of an acquirer and its target on focal acquisition performance? How are they manifested and to what extent? And secondly from an intra-firm perspective: What influences are there from the acquirer's (target's) previous alliance experiences on the performance of the focal acquisition? How and to what extent?

Our main contribution to the literature is the study of a new mechanism that explains the cross-form effect. We call it the *experience interactions mechanism* because, as we shall propose, firms with similar levels of alliance experience have mutually positive influences or experience interactions that benefit the focal acquisition's performance. Explaining the mechanism in a nutshell, as a firm increases alliance experience it develops ever more flexible alliance routines and operational language to manage its growing number of alliance partners, i.e. alliance experience develops a firm-level alliance capability and alliancing processes (Anand and Khanna, 2000; Kale, Dyer, and Singh, 2002; Kale and Singh, 2007). We argue that in a focal acquisition, firms with similar levels of alliance experience will have stronger positive mutual influences or interactions on each other's ability to cooperate in the acquisition compared to firms with dissimilar levels of alliance experience. In a word, acquisition performance depends on the ability of *both* acquirer and target to cooperate, and that these cooperative abilities are learned by each firm through the accumulation of alliance experience.

As far as we are aware, there are at least two other theoretical mechanisms that have been proposed to explain the cross-form effect. The *process similarities mechanism* is based on the theory of transfer effects (see Zollo and Reuer, 2010; Finkelstein and Haleblian, 2002). Process transfer effects are positive when two events are similar and processes learned from and generalized in the first event and are appropriately applied in the second (Mazur, 1998). Negative transfer effects, however, are the result of incorrect generalization or inappropriate application of processes in the second event (Novik, 1988). We will discuss this mechanism in further detail in the following section. The other mechanism, the *prior alliance* or *partner-specific alliance mechanism* (see Porrini, 2004a; Zaheer et al, 2010; Al-Laham, Schweizer, and Amburgey, 2010) argues that the cross-form effect can be explained by the existence of one or more prior alliances between an acquirer and its target (i.e. repeated partner-specific

alliances between two firms that later engage in an acquisition).   We argue that this mechanism is not sufficiently comprehensive at describing alliance experience or acquisition activity and so is not included in this study.

The two mechanisms we study have contrasting explanations of the cross-form effect. On the one hand, the process similarities mechanism argues that alliance processes produce a cross-form effect to the extent that alliancing and acquisitioning activities using these processes are similar. On the other hand, the experience interactions mechanism says that these processes produce a cross-form effect to the extent that they have mutual influences or interact with each other. Although the two mechanisms have two different theoretical explanations, they are in fact complementary and can be combined into a single cross-form mechanism because both are grounded in the same phenomenon: through alliance experience firms develop cooperative alliancing processes that combine to affect performance in different ways (Simonin, 1997; Zollo and Winter, 2002; Heimeriks and Duysters, 2007). By further studying the two mechanisms from both inter-firm and intra-firm perspectives, we develop a more nuanced and integrated explanation of the cross-form effect.

In this paper, the mechanisms are used to study a particular case of the cross-form effect, namely how previous alliance experience affects focal acquisition performance. However, the same mechanisms can also be used in the study of other types of focal events involving previous alliance experience. In remainder of the paper, we derive hypotheses for the case of alliance experience effects on acquisition performance and test them on a sample of 505 acquisitions by publicly traded US acquirers of publicly traded US targets made between 1988 and 1997 in which either the acquirer or target was in the manufacturing sector. We find strong empirical support for our main hypotheses.

2. THEORY AND HYPOTHESES

A central tenet of organizational learning theory concerns how firms develop routines or processes as they gain experience (March and Simon, 1958; Levitt and March, 1988). How routines become a source of competitive advantage is central to the concerns of strategic management (Nelson and Winter, 1982). Routines are encoded behaviors of an organization under familiar conditions that reflect its experience (Zollo and Winter, 2002). Because of prior successful experience, organizations tend to repeat certain behaviors, such as engage in alliances or acquisitions (Haleblian, Kim, and Rajagopalan, 2006; Wang and Zajac, 2007). Good recent performance positively moderates the effect of experience reinforcing the importance of the routines (Haleblian et al, 2006). Through experience, organizational routines become dynamic capabilities as they are continuously renewed and adapted in response to the changing competitive environment (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000). By experience, a firm's dynamic capabilities become a source of its competitive advantage (Barney, 1991).

The literature speaks of three main types of alliance experience: general, related industry, and prior alliance/ partner-specific (e.g. Reuer, Zollo, and Singh, 2002; Stuart, 2000; Barkema and Schijven, 2008. General alliance experience includes all alliances regardless of the industry that the acquirer (target) has engaged in before the focal acquisition. Related industry alliance experience refers to the alliances the acquirer (target) has had before to the focal acquisition in industries which are similar to the industry of the target (acquirer). Prior alliance/ partner-specific experience refers to the alliances the acquirer has had with the target prior to a focal acquisition.

Despite favorable arguments for a cross-form mechanism that originates from prior alliance / partner-specific experience, we do not consider such a mechanism in this study. For example, a prior alliance between acquirer and target decreases information asymmetries

prior to a focal acquisition reducing problems associated with over/ under valuations (Vanhaverbeke, Duysters, and Noorderhaven, 2002), promotes the development of relation-specific routines that reduce transaction costs of the acquisition (Dyer and Singh, 1998; Hennart, 1988), and increases trust between focal firms' managements which benefits the post-acquisition integration process (Agarwal, Anand, and Croson, 2006). However, we exclude such a mechanism for the following three reasons: (1) partner-specific alliance experience acts at the dyad level to develop relation-specific routines and capabilities (Zollo et al, 2002; Gulati, Lavie, and Singh, 2009). Because they are tacit to a particular relationship, they are not easily transferrable to other alliances (Dyer and Singh, 1998), and by logical extension not easily transferrable to other activities such as acquisitions; (2) partner-specific alliances between firms which consummate in their acquisition make up only a small fraction of acquisition activity and therefore do not represent any general trend that firms have engaging in alliances. In prior studies, as few as only 1.3% (see Al-Laham et al, 2010) and at most a mere 8% (see Porrini, 2004a; Zaheer et al, 2010) of acquisitions involved firms that had a prior alliance between the acquirer and target. Finally, (3) studies that have investigated the effect of prior alliance / partner-specific alliance experience on performance have contradictory conclusions[1], which would seem to indicate some other factors external to prior alliance / partner-specific alliance experience are at play.

We thus define the broad sense of the term "alliance experience" of a firm to mean the combined experience it has gained from its general and related industry alliance experiences. Alliance experience acts at the firm level and develops cooperative dynamic capabilities required for dealing flexibly and adaptively with multiple and heterogeneous alliance partners (Zollo et al, 2002; Gulati et al, 2009). Alliance experience, however, has been associated with

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[1] Studying the effects of partner-specific alliance experience on acquisition performance, Zaheer et al (2010: 1085) contradicts and even challenges the findings of Porrini (2004a), where as in studying the effects on alliance performance, despite having very similar data sets Hoang and Rothaermel (2005) contradicts Zollo, Reuer, and Singh (2002).

many other firm capabilities and processes: building relational capital (Kale, Singh, and Perlmutter, 2000), honing relational capabilities (Heimeriks, Duysters, and Vanhaverbeke, 2007), developing absorptive capacities (Mowrey, Oxley, and Silverman, 1996), engendering trust (Gulati, 1995), and strengthening alliance capabilities (Kale et al, 2002; Kale and Singh, 2007), etc.

Unraveling these broad influences therefore presents a challenge. We begin doing so by presenting the theory and hypotheses that explain the cross-form effect as if they were two independent theoretical mechanisms. At the end of this section, we integrate the two mechanisms and argue that together they form complementary explanations of the overall effect. Figure 1 illustrates the integrated relationship between the two mechanisms and how they are distinguished by the inter-firm and intra-firm perspectives.

Figure 1:
Integrated mechanisms explaining the cross-form effect
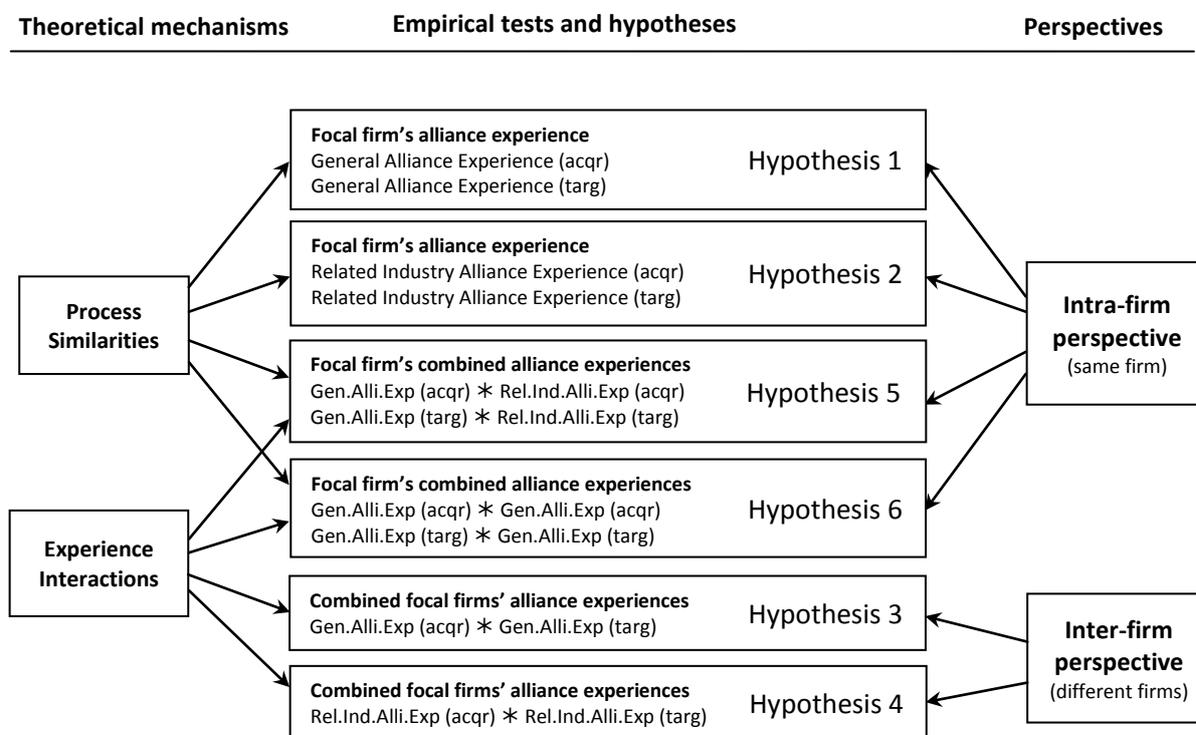
2.1 Process similarities mechanism

The process similarities mechanism is inherently an intra-firm mechanism acting within the same organizational structure and is based on the theory of transfer effects (Novik, 1988; Finkelstein and Haleblian, 2002). The theory predicts that a firm learns to generalize correctly if the differences between past experience and a focal event are not too large. Correctly generalized past experience that is appropriately applied to the focal event are described as positive transfer effects (Novik, 1988). Furthermore, with more experience firms may continue to correctly generalize even if differences between past experience and the focal event become larger (Finkelstein and Haleblian, 2002). However, if differences are too large and experience is low, the firm may incorrectly generalize and/ or inappropriately apply past experience to the focal event, resulting in negative transfer effects (Finkelstein and Haleblian, 2002; Porrini, 2004b).

Firms learn alliancing processes through experience engaging in alliances (Kale and Singh, 2007; Anand and Khanna, 2000). The learned processes include tasks, behaviors, and routines that together comprise the cooperative strategies or collaborative know-how that a firm can use to improve performance in different events (Simonin, 1997), such as alliances and acquisitions. In the process similarities mechanism, a firm first generalizes the alliance processes it has learned and then applies the ones it finds appropriate to the focal acquisition to the extent that previous alliance experiences are similar to the acquisition. If there are strong similarities, the chance of correct generalization and appropriate application of the alliances processes is high, resulting in positive cross-form effects; if the differences are large, the chance of incorrect generalization and/ or inappropriate application is high, which results in negative cross-form effects.

The key element of the process similarities mechanism is therefore the extent to which the intra-firm processes in both alliances and acquisitions are similar. If the processes

were predominantly similar, the net cross-form effect would be positive. Comparing the processes in both these governance forms (Zollo and Reuer, 2010), some are similar in that both have need for intensive cooperative negotiation processes. However, others are also quite different. For example, while the acquisition process is highly structured and hierarchical, the alliance process is fluid and flexible (Doz, 1996; Ariño and De La Torre, 1998) and involves co-evolution of trust, control, and learning (Inkpen and Currall, 2004). What then is the net cross-form effect? Zollo and Reuer (2010: 1197) answer this question: "…the experience spillover effects between alliances and acquisitions are *indeterminate* and ultimately a matter to be resolved empirically… (and that) … predictions regarding the direct linear effects of (general) alliance experience on post-acquisition performance are *ambiguous*".

It would seem that observing the cross-form effect based on process similarities will be a data dependent phenomenon. This suggests that at the theoretical level we will not be able to determine the net cross-form effect. This leads to our first baseline[2] hypothesis:

Hypothesis 1 (Baseline). The correlation between a firm's general alliance experience and the performance of a focal acquisition is indeterminate.

Hypothesis 1 does not intend to suggest that there is no influence of general alliance experience on acquisition performance. Rather that the theoretical interpretation of its influence is not immediately obvious and caution is needed in drawing conclusions from empirical results that may show significant effects. Theoretically, there may be indirect influences under at least two of the following circumstances (Zollo and Reuer, 2010). Firstly, through operating multiple alliances, firms develop the ability to work in flexible and less

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[2] As general and related industry alliance experiences are common measures used in prior literature, Hypotheses 1, 2 and 6 are described as "baseline" hypotheses for the sake of comparison.

integrated environments (i.e. low hierarchical control). When they become an acquirer in a focal acquisition that requires pursuing low levels of integration, a high level of alliance experience is deemed appropriate and beneficial to the acquisition. Secondly, again through engaging in multiple alliances, firms develop cooperative capabilities. When they become an acquirer in an acquisition that requires a high level of relational quality, previously learned cooperative behaviors and practices will be appropriate in making the acquisition successful.

In contrast with general alliance experience, the influence of related industry alliance experience on acquisition performance may be clearer in two ways. Firstly, as an acquirer (target) increases alliance experience prior to the focal acquisition in industries related to those of its future target (acquirer), it becomes familiar with the target's (acquirer's) technology and industry practices, growing in related industry alliance experience. Greater related industry alliance experience means it is less likely that the acquirer (target) will inappropriately apply alliance processes in the focal acquisition because of its deeper knowledge of what is appropriate in the target's (acquirer's) industry. The result is less negative transfers and a more significant cross-form effect. Secondly, the acquirer develops increased relative absorptive capacity with respect to the target (Lane and Lubatkin, 1998). Greater related industry absorptive capacity confers on the acquirer more valuable strategic options (Kogut, 1991; Kogut and Kulatilaka, 2001) because it is better able to search, screen, and value suitable targets within the related industries in which it has alliance experience. Also, with greater related industry absorptive capacity, the acquirer can be more certain about the size of the pool of its potential targets and about its chances of making a successful acquisition.

Given these arguments related industry alliance experience should be a more superior predictor of process transferability between organizational forms than general alliance experience. Said differently, while increasing related industry alliance experience will still

result in some negative transfers, they will be considerably less than those attributed to general alliance experience. This leads to the second baseline hypothesis:

Hypothesis 2 (Baseline). A firm's related industry alliance experience is positively correlated with focal acquisition performance.

With alliance experience, firms often set up an alliance function, a formal/ informal organizational structure that manages the intra-organizational alliance processes (Anand and Khanna, 2000). The same alliance function can also develop inter-organizational alliance processes (Zollo et al, 2002; Dyer and Singh, 1998). Inter-firm alliance processes develop as firms gain experience engaging in multiple alliances in different industries and geographies (Inkpen, 1998, 2000; Hoang and Rothaermel, 2005; Kale et al, 2002; Sampson, 2005). If focal acquisition firms both have inter-firm alliance processes, then the natural question arises as to whether the alliances processes they have developed independently of each other can be combined to have a cross-form effect, and if so, by what mechanism?

2.2 Experience interactions mechanism

More specifically, how do a focal acquirer and its target combine their alliance experiences to positively affect acquisition performance? We argue that the mechanism focal firms use to achieve the cross-form effect is through experience interactions. We motivate the explanation of the mechanism with the following intuitive example. If cooperation between both focal firms were needed to achieve good performance, if one had strong cooperative capabilities and the other had weak ones, the result would only be as good as the one with the weakest and even possibly less than their combined capabilities. However, if both had strong

cooperative capabilities, the result is more likely to be synergistic because of their mutual positive influence or positive experience interactions.

Properly stated, prior to the focal acquisition both acquirer and target independently develop cooperative alliance processes (including routines, practices, behaviors, and operational language) to manage their multiple alliances. If both have similar maturities in alliance experience, it is more likely that cooperation is more quickly established than if there were large differences in their experience maturities or if both had no previous alliance experience at all. In short we argue that synergies due to cooperation are inherently dependent on the cooperative abilities of *both* focal firms. If general alliance experience is an indicator for the alliance experience maturity of each of the focal firms, then we hypothesize the following:

Hypothesis 3. The interaction between the general alliance experiences of an acquirer and its target is positively correlated with focal acquisition performance.

Related industry alliance experience is another indicator of cooperative ability although more specific to a particular industry. The related industry alliance experience of a firm is gained from its alliances that operate in industries which are similar to those of its future target (acquirer). Although a focal firm may be an outsider to an industry, by virtue of its previous alliances in that industry it gains industry-specific experience and knowledge and grows in situation similarity (see Finkelstein and Haleblian, 2002) [3]. Growing in situation similarity means developing industry-specific absorptive capacity (Zahra and George, 2002), deeper insight into the industry's tacit knowledge and practices (Grant and Baden-Fuller,

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[3] In the context of understanding the effect of acquisition experience on acquisition performance, Finkelstein and Haleblian (2002) referred to "situation similarity" as the similar industrial environments of an acquirer and its target. They said: "Situation similarity may increase the potential for positive transfer (of practices and behaviors) because an acquirer from a similar industrial environment can apply relatively more appropriate behavior to the target than could another acquirer from a dissimilar industrial environment (p. 37-38).

2004), and sensitivity to the needs of the industrial environment. In the focal acquisition, an acquirer with a high level of related industry alliance experience with respect to its target will have more specific knowledge and ability of how to gain the latter's confidence and cooperation, even more so than having a high level of general alliance experience that reflects only a general type of cooperative ability.

If both the acquirer and target have similar levels of related industry alliance experience, the mutual influence of their experiences will increase the likelihood of maximizing their cooperation. Mutual situation similarity means there is a broader common basis on which to address each other as industry peers of their respective industries. Mutual situation similarity enables them to behave in reciprocally appropriate ways, positively affecting the post-acquisition integration process (Finkelstein and Haleblian, 2002). In the integration process, the acquirer can more appropriately apply industry practices that are acceptable to the target, while the target will be less surprised by the practices being applied to it.

If related industry alliance experience is a measure of the acquirer's (target's) situation similarity with respect to the industry of its target (acquirer), then the interaction between the acquirer's related industry alliance experience and that of its target's will provide a measure for their mutual situation similarity. This suggests our next hypothesis:

Hypothesis 4. The interaction between the related industry alliance experiences of an acquirer and its target is positively correlated with focal acquisition performance.

While the process similarities mechanism is fundamentally intra-firm, the experience interactions mechanism is more versatile. Not only can it describe the cross-form effect from

an inter-firm perspective as we have done for Hypotheses 3 and 4, but can also do so from an intra-firm perspective.

Moreover and more importantly, we argue that first increasing alliance experience stimulates intra-firm knowledge specialization and that then engaging in an acquisition presents an occasion for intra-firm knowledge integration. The result of this succession of knowledge specialization and integration is precisely the cross-form effect that we wish to observe and can be described by the experience interactions mechanism as follows. As a firm matures in its alliance experience and in order to optimally integrate within the firm itself learning from its multiple alliance partners, either formal or informal alliance learning structures are set up to manage the learning process (Anand and Khanna, 2000). This means that while some groups of people in the firm continue to develop their specialized technical knowledge, other groups specialize in the intra-firm dissemination of knowledge processes and learning practices (Grant, 1996; Grant and Baden-Fuller, 2004). A focal acquisition presents an occasion in which (at least) these two groups of people or knowledge specialists need to cooperate in order to integrate their specialized know-how. Through formal and informal processes of social interaction between these groups of knowledge specialists, they cooperate and integrate their knowledge to transform it[4] into new knowledge that can be exploited (Zahra and George, 2002; Grant and Baden-Fuller, 2004). The extent to which knowledge specialization and integration has successfully occurred within the firm can be measured by the extent of the cross-form effect.

General alliance experience is a logical measure of the extent to which knowledge specialists have developed knowledge dissemination practices across the firm. Related industry alliance experience, on the other hand, provides measure of the level of specialized technical knowledge that a firm has gained from working in industries related to the other

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[4] According to Zahra and George (2002: 190), the transformation of existing knowledge and creation of new knowledge occurs through a process called bisociation, which occurs when a situation or idea is perceived in "two self-consistent but incompatible frames of reference" (Koestler, 1966: 35).

firm involved in a focal acquisition. The extent to which these two measures interact will therefore provide an indication not only of the success of the integration of a firm's knowledge by its knowledge specialists, but also provide an indication of the intra-firm cross-form effect, about which we can hypothesize as follows:

> *Hypothesis 5. The interaction between a firm's general alliance experience and its own related industry alliance experience is positively correlated with focal acquisition performance.*

2.3 Integrating into one mechanism

The description we have given so far of the cross-form effect started with the more familiar and existing theory of the process similarities mechanism, a mechanism that inherently takes an intra-firm perspective of a firm's alliance processes (Hypotheses 1 and 2). Venturing into new territory, we then introduced the experience interactions mechanism to explain the cross-form effect from an inter-firm perspective (Hypotheses 3 and 4). However, the experience interactions mechanism is also able to describe an important aspect of the cross-form effect from an intra-firm perspective (Hypothesis 5). The question is therefore, are the two mechanisms independent or can they be integrated into one?

We argue that while the path that each theoretical mechanism takes to explain the cross-form effect is different, together they form one integrated theoretical mechanism[5]. We give two reasons for this. Firstly from a theoretical point of view, both mechanisms are based on the same phenomenon: that by increasing in alliance experience, a firm develops alliance processes that affect performance (Simonin, 1997; Zollo and Winter, 2002; Heimeriks and Duysters, 2007). As alliance experience has broad influences that are manifested in many and

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[5] One possible name for this unified mechanism is the "process similarities and interactions mechanism".

varied ways, it is not surprising that there are at least two paths or mechanisms that describe the cross-form effect.

The second reason is some co-incidental evidence that consistently appears in previous empirical studies (Porrini, 2004b; Zollo and Reuer, 2010; Haleblian and Finkelstein, 1999). These studies frequently discuss the mutual influence of current and earlier experience on performance, an effect that is often tested as the "square of experience". This literature generally reports a non-linear U-shaped relationship between experience and performance. The process similarities mechanism explains this U-shaped effect as follows: initial alliance experience results in a baseline for acquisition performance; subsequent alliance experience will result in acquisition performance that is lower than the baseline because of negative transfers or inappropriate application of alliance processes to the focal acquisition; as alliance experience increases, negative transfers or inappropriate application of processes will diminish and acquisition performance will increase above the baseline.

However this same U-shaped cross-form effect can be explained using the experience interactions mechanism: after firms engage in their initial alliance, they mark a baseline level of acquisition performance, but with only a single alliance they will be unable to develop significant alliance learning structures; with subsequent alliances but with still low levels of alliance experience, firms will suffer from both diseconomies of scale (insufficient alliances to develop alliance learning structures) and scope (more alliances with different knowledge bases), resulting in acquisition performance below the baseline; finally, as alliance experience increases, the diseconomies of scale and scope will start to disappear and synergies of the alliance learning structure within the firm will improve acquisition performance beyond the baseline.

The description of the cross-form effect using the "square of alliance experience" provides a convenient point at which to unify and integrate the process similarities and

experience interactions mechanism into one. Following the earlier literature, we finish with

another baseline hypothesis:

Hypothesis 6 (baseline). The squared interaction involving prior general alliance experience is positively correlated with focal acquisition performance.

The theoretical arguments supporting the hypotheses we have proposed together provide a comprehensive theory that integrates existing and new theoretical mechanisms that explain the cross-form effect. Figure 1 illustrates this integrated view of both mechanisms. By taking inter-firm and intra-firm perspectives with both mechanisms, we form a broader yet more fine-tuned understanding of the cross-form effect.

3. DATA AND METHODS

3.1 Data and Sample

The data is from the *Securities and Data Corporation's (SDC) Platinum*. The sample is of acquisitions announced in the ten calendar years between 1 January 1988 and 31 December 1997 by public US acquirers of public US targets in which either the acquirer or target were in the manufacturing sector. We initially obtain 853 completed acquisitions in which the acquirer took a majority controlling share of the target. We also collect from the *SDC Platinum* data for alliances and acquisitions that were announced by both the acquirer and target firms in the four years preceding the focal acquisition announcement. We keep only firms with available firm data in the *Compustat* database and final sample is reduced to 505 focal acquisitions.

3.2 Measures

Dependent Variable. *Change in Return on Assets (ROA change).* A ROA-based measure for acquisition performance provides a stable accounting measure across turbulent times such as an acquisition (Meaks & Meaks, 1981). ROA Change is measured as the difference between the post-acquisition ROA of the acquirer two years after the acquisition announcement and the weighted pre-acquisition ROA of the acquirer and target one year before the acquisition announcement, all divided by the weighted pre-acquisition ROA of the acquirer and target. The weighted pre-acquisition ROA is the sum of the pre-acquisition ROAs of the acquirer and target weighted by their respective assets two years before the acquisition announcement date. Annual data from *Compustat* was used for the ROA calculations with at least one calendar year before and two calendar years after the date of the acquisition announcement. Equation (1) elaborates this definition.

$$\text{ROA}_{\text{chg}} = \frac{\text{ROA}_{+2, \ \text{acqr}} - \ \text{ROA}_{-1, \ \text{acqr+targ}}}{\text{ROA}_{-1, \ \text{acqr+targ}}}$$

(1)

Explanatory Variables. *General alliance experience* is calculated separately for the acquirer and target firms. It is defined as the number of prior alliances in the previous four years to the focal acquisition. This measure follows similar truncated experience variables used by other researchers[6]. Due to the positive skewness of the alliance experience variables, they are transformed using a monotonic logarithmic transformation following Zollo et al. (2002)[7]. Without the transformation, tests for multicollinearity identified the potential problems with these variables.

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[6] For example, Porrini (2004a) uses the count of the number of alliances in the four previous years to the focal acquisition; Anand and Khanna (2000) use the count of alliances since 1990 for their 1990 to 1993 data sample; and Reuer, Park and Zollo (2002) use the number of alliances in the past ten years before focal alliance announcement.

[7] "New variable" = ln(1 + "old variable")

Related industry alliance experience is calculated separately for the acquirer and target. However, for robustness testing, we have two different measures. *Related Industry Alliance (RIA) Experience* is like general alliance experience in that only the four years of alliances prior to the acquisition year are counted, and like general alliance experience, it is a coarse-grained variable. RIA is a simple count variable of the number of previous alliances that an acquirer (target) had whose industries overlap with those of the target (acquirer). For example, if there is any overlap between the set of industries of one of the acquirer's (target's) previous alliances and the set of industries of the target (acquirer) then RIA=1; if there is an overlap between the industries of two of the acquirer's (target's) previous alliances and the set of industries of the target (acquirer) then RIA=2; etc. The results we report use SIC3 (3-digit Standard Industrial Codes), but for robustness checks we do the analysis also using SIC2 and SIC4 with no qualitative change in the results. The SICs reported in *SDC Platinum* database are considered highly accurate (Anand and Khanna, 2000; Schilling, 2009) and are of fundamental importance for this study.

A second measure for related industry alliance experience is called Accumulated Related Industry Prior Alliance (ARIPA) Experience. Making use of other alliance industry information provided by SDC Platinum, ARIPA Experience is a finer-grained measure of the industry relatedness that an acquirer (target) has with its target's (acquirer's) industry allowing us to be more precise about the effect that we are measuring than the RIA Experience variable. Unlike RIA which counts as one full unit of experience each acquirer (target) alliance where there is overlap between any of the industries of an acquirer's (target's) previous alliances with any of those of its target (acquirer), ARIPA only counts as experience the fractional proportion of the overlap of industries between the previous alliance's industries and those of the focal firm. We capture the idea of ARIPA in Figure 2.

Figure 2:
Accumulated Related Industry Prior Alliance Experience (ARIPA)
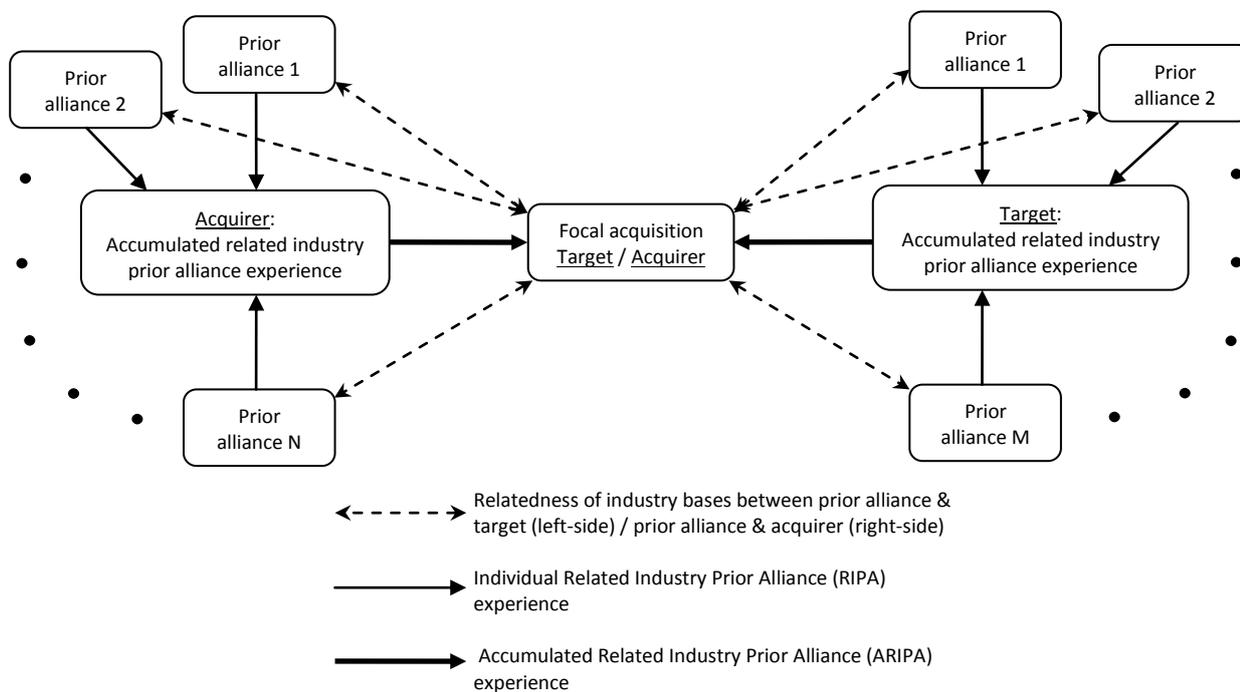
More formally, the calculation of the acquirer ARIPA experience of the kth focal acquisition is the sum of the related industry prior alliance (RIPA) experiences for each of the acquirer's *M* prior alliances. RIPA, for each *prior alliance i*, is the ratio of the number of SICs of *prior alliance i* that match the SICs of the focal *target k* divided by the sum of the unique SICs of the *target k* and *prior alliance i*[8]. The same is used to calculate the target's ARIPA experience. Equations (3a) and (3b) define this measure.

$$\text{Acqr ARIPA}_k = \sum_{i=1}^{M} RIPA_i = \sum_{i=1}^{M} \frac{\text{No. of matching SICs of target } k \ \& \ prior \ alliance \ i}{\text{Total No. of unique SICs of target } k \ \& \ prior \ alliance \ i}$$

(3a)

$$\text{Targ ARIPA}_k = \sum_{j=1}^{N} RIPA_j = \sum_{j=1}^{N} \frac{\text{No. of matching SICs of acquirer } k \ \& \ prior \ alliance \ j}{\text{Total No. of unique SICs of acquirer } k \ \& \ prior \ alliance \ j}$$

(3b)

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[8] For each acquirer, there are three types of SICs provided by *SDC Platinum* that could be compared with the target's SICs: the acquirer's SICs (acquirer's industry), the acquirer's alliance partner's SICs (partner's industry), and the SICs of the alliance's business (alliance's industry). We use the third type to calculate the acquirer's ARIPA variable. Similarly for the target ARIPA calculation.

where k is the number of focal acquisitions, M and N are the number of prior alliances in the four years previous to

that of the focal acquisition for the of the acquirer and target respectively.

RIPA experience is the related industry prior alliance experience that *alliance i* had

with *acquirer k* (*alliance j* had with *target k*) prior to the focal acquisition in the industry of

target k (*acquirer k*) and is a continuous variable between 0 and 1. In addition, ARIPA

experience for *acquirer k* (*target k*) is the sum of all the related industry prior alliance

experiences that the M prior alliances of *acquirer k* (N prior alliances of *target k*) had in all

the industries of *target k* (*acquirer k*) and is a continuous variable between 0 and M (0 and

N).

To allay any concerns about the statistical independence between the measures for

general alliance experience and for related industry alliance experience (both RIA and

ARIPA), we follow Hoang and Rothaermel (2005) and adjust general alliance experience by

subtracting the number of prior alliances in which the acquirer (target) had a positive related

industry alliance experience (i.e. positive RIA or ARIPA). For example, if an acquirer had

five alliances prior to the focal acquisition and two of them were in the same industry as the

focal target, then the general alliance experience variable would be adjusted downward to

three (i.e. 5 minus 2).

Due to positive skewness, we also transformed the measures for related industry

alliance experience (RIA and ARIPA) using a monotonic logarithmic transformation

following Zollo et al. (2002).

Control Variables. As industries go through cycles of expansion and consolidation,

we controlled for *industry change in return on assets*. *Relative size of focal acquisition* was

measured as the ratio of the target to acquirer's total assets prior to the focal acquisition

following Datta (1991). Relatively small acquisitions will have less material impact on

acquisition performance than larger ones, hence it is important to control for the different

relative acquisition sizes. We controlled for the *acquirer to target relatedness*, which was found to be positively associated with acquisition performance as situation similarity between firms from related industries increases the potential for positive knowledge transfers (Finkelstein and Haleblian, 2002).

Consistent with similar past studies (Ingram and Baum, 1997; Haleblian and Finkelstein, 1999; Zollo and Reuer, 2010), we controlled for *acquirer and target acquisition experience* measured as the number of past acquisitions in the four years prior to the focal acquisition. Like Porrini (2004a), we controlled for the *change in sales* as an acquisition may increase returns because of greater economies of scale in the combined firm with no increase in the pre-acquisition combined sales. We controlled for the *change in the debt to equity ratio*, but for the acquirer only. Past studies have shown that acquirer debt increases following an acquisition (Kim and McConnell, 1977; Shrieves and Pashley, 1984; Bruner, 1988). If the deal is excessively leveraged, it may begin to affect the ability to service the debt, lowering rates of return and acquisition performance. *Method of payment* was coded 1 if the acquisition was an all cash deal or 0 if it was some other form of payment including partially cash and stock or all stock. Acquisitions that are challenged by other bidders tend to be done so at the cost of higher prices paid by the eventual acquirer, which in turn affects acquisition performance. To control for this effect, we added the variable for *deal challenged,* which was coded 1 if challenged by another bidder and 0 otherwise. The variable that measured the attitude of the target to the acquirer was coded 1 if the *deal was friendly* and 0 if it was otherwise. The dummy variable, *target is in a high technology industry* was coded 1 if true and 0 otherwise. Year dummies were also included in the regression analysis for nine of the ten years of the same from 1988 to 1996 with 1988 being the omitted year.

Model

ROA change =

$$
\begin{aligned}
\text{Controls}
&\left\{
\begin{array}{ll}
+\ \beta_1(\text{industry change in roa}) & +\ \beta_2(\text{relative acquisition size})\\
+\ \beta_3(\text{acqr to targ relatedness}) & +\ \beta_4(\text{acqr acquisition exp.})\\
+\ \beta_5(\text{targ acquisition exp.}) & +\ \beta_6(\text{change in sales})\\
+\ \beta_7(\text{change in debt equity ratio}) & +\ \beta_8(\text{method of payment})\\
+\ \beta_9(\text{deal challenged}) & +\ \beta_{10}(\text{deal friendly})\\
+\ \beta_{11}(\text{target high-tech}) & +\ \beta_{21\text{-}31}(\text{constant, year dummies})
\end{array}
\right.
\end{aligned}
$$

$$
\text{H1, H2}
\left\{
\begin{array}{l}
+\ \beta_{12}(\text{acquirer's general alliance experience})\\
+\ \beta_{13}(\text{target's general alliance experience})\\
+\ \beta_{14,16}(\text{acquirer's related industry alliance experience})\\
+\ \beta_{15,17}(\text{target's related industry alliance experience})
\end{array}
\right.
$$

$$
\text{H3}
\left\{
\ +\ \beta_{18}(\text{acquirer's gen. alli. exp.} \ast \text{target's gen. alli. exp.})
\right.
$$

$$
\text{H4}
\left\{
\ +\ \beta_{19,20}(\text{acquirer's related ind. alli. exp.} \ast \text{target's related ind. alli. exp.})
\right.
$$

$$
\text{H5}
\left\{
\begin{array}{l}
+\ \beta_{18,20}(\text{acquirer's gen. alli. exp.} \ast \text{acquirer's related ind. alli. exp.})\\
+\ \beta_{19,21}(\text{target's gen. alli. exp.} \ast \text{target's related ind. alli. exp.})
\end{array}
\right.
$$

$$
\text{H6}
\left\{
\begin{array}{l}
+\ \beta_{22}(\text{acquirer's general alliance experience})^2\\
+\ \beta_{23}(\text{target's general alliance experience})^2
\end{array}
\right.
$$

4.   RESULTS

4.1   Descriptive Statistics

Table 1a shows the descriptive statistics of our full sample of 505 observations based on an SIC3 industry definition. There are several points of interest in this table. There is a considerable difference between the mean ROA change of 0.79 (sd 6.40) and the Industry Median ROA change of -0.09 (sd 0.33). Compared with the industry median, our sample median is performing considerably above the industry, however the wide standard deviation makes the difference statistically insignificant.

Looking at other interesting descriptive statistics from Table 1a from the acquirer's perspective, there were 256 (51%) of the full sample of 505 acquisitions in which the acquirer had alliance experience. In 173 of these acquisitions, the acquirer had related alliance experience in the same industry as the target (i.e. had a positive value for ARIPA), which

means 68% (173/256) of acquirers that had alliance experience had it in the same industry as its future target. Similarly from the target's perspective, there were 179 (35%) acquisitions in which the target had alliance experience. In 125 of these acquisitions, the target had related alliance experience in the same industry as the acquirer, which means that almost 70% (125/179) of targets that had alliance experience had it in the same industry as its acquirer. The high percentages of these conditional sub-subsamples seem to suggest to a limited extent that there may have been strategic intent for acquiring in the industry signaled by alliance activity in that industry well before the focal acquisition was announced.

Table 1b shows the correlation matrix of the full sample. A number of pairs of variables have correlation coefficients close to one and with high statistical significance. However, there only need be concern for those variables that enter the regression equation together. Therefore, of specific concern should be the correlations pairs between Acquirer General Alliance Experience with Acquirer RIA experience and with Acquirer ARIPA experience, which are .68 and .67 respectively (both p<.01), and those between Target General Alliance Experience with Target RIA experience and with Target ARIPA experience, which are .5 and .45 respectively (both p<.01). These pairs of variables will have naturally occurring correlations because industry experience is a subset of general experience. However, we have specifically addressed the independence of these pairs of variables during their construction using similar methods of prior studies (i.e. Hoang and Rothaermel, 2005).

The logarithmic transformations of the experience variables improved the results of the tests for multicollinearity. The variance inflation factors (VIF) were calculated for all the OLS regression models and the maximum individual VIF was 5.26, which is below the limit of 10, and a mean VIF of 2.03, which is also well within the acceptable limits (Chatterjee, Hadi, and Price, 2000).

4.2 Analysis

We present and analyze the regression results according to the integrated view of both mechanisms that explains the cross-form effect, starting first with the inter-firm perspective and then intra-firm.

Inter-firm perspective. Table 2a shows the results of the regression for the inter-firm perspective of the cross-form effect. This table answers the question: To what extent do the acquirer and target's previous alliance experience have mutual influences that affect the performance of the focal acquisition?

Hypothesis 3 states that when the acquirer and target combine their general alliance experience, their interaction will positively affect focal acquisition performance. Models (2) and (6) show this to be true with a positive and highly significant coefficient estimate of 1.3 ($p < .001$) in both models. Even after controlling for the interactions of relative alliance experiences between the acquirer and target, models (4) and (8) show this conclusion continues to hold true in with statistically significant coefficient estimates of .99 ($p < .05$) and .91 ($p < .05$) respectively. This is clear evidence that Hypothesis 3 is strongly supported.

Hypothesis 4 says that focal acquisition performance will be positively affected when acquirer and target interactively combine their relative industry alliance experience. Similar to the previous hypothesis, models (3) and (5) show this to be true for both versions of relative industry alliance experience with highly statistically significant and positive coefficient estimates of 1.2 ($p < .001$) and 2.5 ($p < .001$). The conclusion continues to hold even after controlling for the interactions between general alliance experience in models (4) and (8) with significant and positive coefficients of .82 ($p < .05$) and 1.9 ($p < .05$). Again we have strong evidence that Hypothesis 4 is supported.

Figure 3 plots the interactions between the inter-firm alliance experiences of the acquirer and target confirming their mutual positive influence on acquisition performance. It

is also worth noting that the different versions of relative industry alliance experience have different effect sizes with ARIPA Experience consistently having double the effect size compared to RIA Experience. This suggests that ARIPA Experience is performing better as a measure of relative industry experience because of its finer-grained definition compared to RIA Experience.

Figure 3: Inter-firm cross-form effects

Panel A: Acquirer and Target General Alliance Experience Interactions
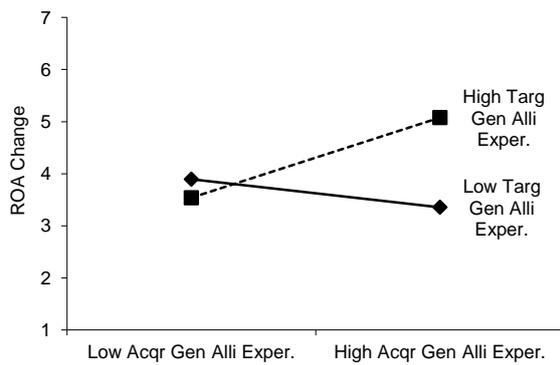
Panel B1: Acquirer and Target RIA Experience Interactions
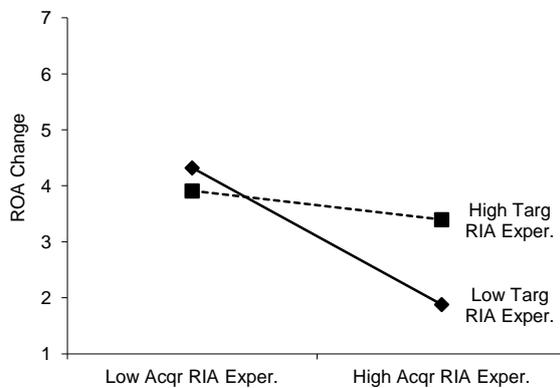
Panel B2: Acquirer and Target ARIPA Experience Interactions
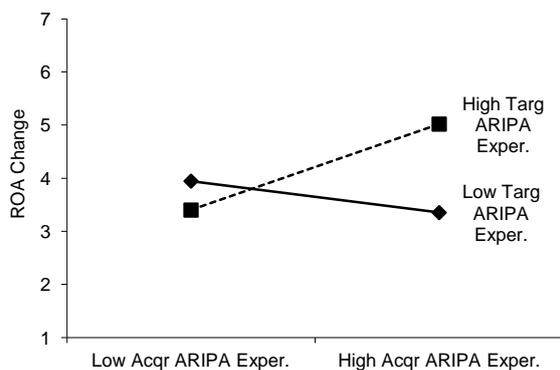
Intra-firm perspective. Table 2b shows the results of the regression for the intra-firm perspective of the cross-form effect. This table answers the question: To what extent do the previous alliance experiences within a firm (acquirer or target) interact to affect focal acquisition performance?

Hypothesis 5 argues that a focal firm with increasing levels of alliance experience will have greater ability to interactively combine within its own organization structure its general alliance and relative industry alliance experiences positively affecting focal acquisition performance. In model (2) when RIA Experience is used to measure relative alliance experience, positive and highly significant coefficients are reported for the acquirer and target with .69 (p<.001) and .13 (p<.05) respectively, supporting the hypothesis. The same support is given in model (5) when ARIPA Experience is used for relative industry alliance experience, which also reports positive significant coefficients of .85 (p<.001) and 2.2 (p<.05) for the acquirer and target respectively, providing strong empirical support for Hypothesis 5.

Hypothesis 1 is a null hypothesis which states that using the process similarities mechanism the cross-form effect of general alliance experience will be indeterminate and that any significant effect is merely a data-dependent effect. An analysis of the results for models testing this hypothesis gives conflicting conclusions. On the one hand, models (1) and (4) would seem to confirm the indeterminacy of the effect, or more accurately stated, the results of these two models do not reject the null hypothesis. On the other hand, models (2) (3) (5) and (6) have significant but negative coefficients that together reject the null. One way of resolving this conflict is to first look at the results of the tests for Hypothesis 6. This hypothesis argues using both the process similarities and experience interactions mechanism that the square of alliance experience will have a cross-form effect. The results of models (3) and (6) provide strong evidence that confirm Hypothesis 6 with significant and positive

coefficient estimates of .47 (p<.05) and 1.4 (p<.05) for the acquirer and .46 (p<.05) and 1.5 (p<.05) for target in each respective model. As we shall explain, it would seem that the two mechanisms that gave rise to these two hypotheses cannot be separated, but are in fact two aspects of the same single intra-firm mechanism.

Looking at the results of both Hypotheses 1 and 6 together, we make an important observation about our results that is consistent with similar previous studies (Haleblian and Finkelstein, 1999; Porrini, 2004b; Hoang and Rothaermel, 2005; Zollo and Reuer, 2010). Like these studies, in models (3) and (6) not only is the coefficient estimate for general alliance experience significant and negative, the coefficient estimate for the square of general alliance experience is also significant and positive. As these studies argue, this particular combination of results indicates that at low levels of alliance experience firms inappropriately apply alliance processes in the focal acquisition resulting in negative (linear) performance, an effect already explained by the process similarities mechanism. As alliance experience increases, firms not only improve at applying alliance processes resulting in positive (non-linear) performance, again explained previously by the process similarities mechanism, but they also improve performance in a way that has been explained by the experience interactions mechanism. The results that test Hypotheses 1 and 6 seem to provide strong evidence, which is also consistent with the empirical findings of earlier studies that the process similarities and experiences similarities mechanisms are in fact working as single mechanism within the firm.

Finally, Hypothesis 2 does not have consistent results across all models in Table 2b. We conclude, although only preliminarily, that there is no support for this hypothesis. We leave the explanation of this conclusion to the next section.

5.   CONCLUSIONS AND FURTHER RESEARCH

The general research question we began with asked how cooperative strategies learned from previous alliance experience influenced focal acquisition performance, which we called the cross-form (transfer) effect. We identified and discussed the process similarities and experience interactions mechanisms that seemed to provide explanations for the cross-form effect and by taking inter-firm and intra-firm perspectives we were able to draw complementary conclusions. The general question was thus divided into two.

Firstly, from the inter-firm perspective, how and to what extent did acquirers and targets combine their alliance experiences to positively influence acquisition performance? The theory and results we presented tell us that focal firms combine their alliance experiences interactively through the experience interactions mechanism. This is one of the main contributions this study makes to the literature on cross-form effects.

Secondly, from the intra-firm perspective, how and to what extent does a firm through its own organizational structure combine its previous alliance experiences to positively affect acquisition performance? We argued that a firm combines its previous alliance experiences using both theoretical mechanisms. We also found strong empirical evidence that is consistent with the findings of earlier studies that an integrated mechanism is at work which consists of both mechanisms working together. Given the theoretical arguments and this empirical finding, our original arguments that led to Hypotheses 1 and 6 should in fact be changed to consider both mechanisms as one integrated cross-form mechanism. This is the second main contribution that this study makes to the literature. Figure 1 illustrates the integrated cross-form mechanism.

However, one hypothesis that was not supported was Hypothesis 2, which said that relative industry alliance experience should have a positive cross-form effect. Since this hypothesis is similar in nature to Hypothesis 1, we believe further investigation is needed to

verify if this Hypothesis 2 is indeed not supportable, or like Hypotheses 1 should be considered together with an analogous hypothesis like that of Hypothesis 6. For example, further research into the "square of relative industry alliance experience" may provide more insight into why Hypothesis 2 was not supported.

Another area for further research is to consider other measures of acquisition performance. For example, Zollo and Reuer (2010) include both accounting and financial performance measures that provide complementary evidence to support their arguments.

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7.   RESULT TABLES

Table 1a: Descriptive Statistics
(see note 1)

Variable	mean	sd	min	max	sum
ROA change	0.79	6.40	-49.29	47.48	n/a
Acqr General Alliance Experience (note 2)	0.67	1.02	0.00	5.43	338.50
Targ General Alliance Experience (note 2)	0.27	0.56	0.00	3.04	137.10
Acqr RIA Experience (note 2)	0.51	0.89	0.00	5.16	257.45
Targ RIA Experience (note 2)	0.33	0.66	0.00	3.61	166.25
Acqr ARIPA Experience (note 2)	0.36	0.71	0.00	4.83	181.88
Targ ARIPA Experience (note 2)	0.19	0.41	0.00	2.30	93.81
No. of prior acqr alli. with RIPA > 0	2.74	13.90	0	173	1382
No. of prior targ alli. with RIPA > 0	0.95	2.78	0	36	478
No. of acqr & targ alli. with RIPA > 0	3.68	15.45	0	206	1860
No. of acqr with prior alliance experience	n/a	n/a	n/a	n/a	256
No. of targ with prior alliance experience	n/a	n/a	n/a	n/a	179
No. of obsv where acqr with ARIPA > 0	n/a	n/a	n/a	n/a	173
No. of obsv where targ with ARIPA > 0	n/a	n/a	n/a	n/a	125
No. of obsv aqcr ARIPA > 0 & targ ARIPA > 0	n/a	n/a	n/a	n/a	83
Industry Median ROA change	-0.09	0.33	-1.01	1.93	n/a
Relative Acquisition Size	1.27	7.08	0.00	114.95	n/a
Acquire to Target Relatedness	0.28	0.29	0.00	1.00	n/a
Acqr Acquisition Experience	2.39	2.89	0.00	14.00	1206
Targ Acquisition Experience	0.86	1.44	0.00	12.00	436
Change in Sales	1.37	5.22	-0.97	74.67	n/a
Change in Debt Equity Ratio	2.15	7.05	-1.00	73.52	n/a
Method of Payment	0.31	0.46	0.00	1.00	157
Deal Challenged	0.07	0.25	0.00	1.00	34
Deal Friendly	0.96	0.19	0.00	1.00	486
Target hi-tech	0.53	0.50	0.00	1.00	269
N=505					

Note 1: The industry definitions are based on SIC3.
Note 2: These variables are transformed according to ln(1+experience) following Zollo et al. (2002).

Table 1b: Correlation Table

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)	ROA Change	1																	
(2)	Acqr General Alliance Experience	-.0027	1																
(3)	Targ General Alliance Experience	.021	.34**	1															
(4)	Acqr RIA Experience	.0036	.68**	.35**	1														
(5)	Targ RIA Experience	.041	.43**	.5**	.57**	1													
(6)	Acqr ARIPA Experience	.021	.67**	.29**	.97**	.54**	1												
(7)	Targ ARIPA Experience	.026	.37**	.45**	.53**	.94**	.52**	1											
(8)	Industry Median Change in ROA	.057	-.022	-.055	-.039	-.059	-.051	-.088*	1										
(9)	Relative Acquisition Size	-.089*	-.045	.021	-.076	.015	-.07	.012	-.000061	1									
(10)	Acqr to Targ Relatedness	.0042	-.029	.082	.24**	.25**	.24**	.31**	-.075	.031	1								
(11)	Acqr Acquisition Experience	.061	.43**	.11*	.36**	.16**	.37**	.13**	.0074	-.11*	-.035	1							
(12)	Targ Acquisition Experience	.053	.18**	.15**	.13**	.18**	.14**	.18**	.01	.046	.082	.13**	1						
(13)	Change in Sales	-.053	-.039	-.0085	.0031	.024	.0037	.035	-.082	-.023	.091*	-.022	-.033	1					
(14)	Change in Debt Equity Ratio	-.00047	.032	.075	.001	.013	-.0048	-.0038	.014	-.014	.041	-.025	.068	.064	1				
(15)	Method of Payment	.1*	.048	-.0015	-.026	-.066	-.0018	-.087*	-.029	-.086	-.19**	.056	.0043	-.12**	.084	1			
(16)	Deal Challenged	.082	-.082	-.029	-.072	-.11*	-.087	-.097*	.011	-.021	-.076	-.00054	-.04	-.03	.027	.076	1		
(17)	Deal Friendly	-.18**	.022	-.042	-.033	-.0085	-.026	.011	.016	.0094	.042	-.0059	-.041	.046	.021	-.14**	-.11*	1	
(18)	Target Hi-tech	-.14**	.27**	.27**	.33**	.33**	.34**	.33**	-.13**	.031	.27**	.05	-.00068	.096*	.042	-.18**	-.16**	.11*	1

N=505, unless otherwise stated

* p<.05

 ** p<.01

Table 2a: Inter-firm Perspective of Cross-form Effect

Dependent Variable: ROA Change	Model: Hyp	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Industry Median Change in ROA		1.1	.91	.9	.83	1.1	.9	.82	.75
		(.91)	(.9)	(.9)	(.89)	(.91)	(.9)	(.9)	(.9)
Relative Acquisition Size		-.065	-.064	-.066	-.065	-.061	-.061	-.065	-.063
		(.041)	(.04)	(.04)	(.04)	(.041)	(.04)	(.04)	(.04)
Acqr to Targ Relatedness		1	1.2	1.4	1.4	.76	1	1.3	1.3
		(1.1)	(1.1)	(1.1)	(1.1)	(1.1)	(1.1)	(1.1)	(1.1)
Acqr Acquisition Experience		.13	.11	.088	.089	.11	.099	.068	.07
		(.11)	(.11)	(.11)	(.11)	(.11)	(.11)	(.11)	(.11)
Targ Acquisition Experience		.1	.075	.076	.063	.12	.091	-.0077	.0047
		(.2)	(.2)	(.2)	(.2)	(.2)	(.2)	(.2)	(.2)
Change in Sales		-.034	-.038	-.039	-.04	-.034	-.038	-.038	-.039
		(.055)	(.054)	(.054)	(.054)	(.055)	(.054)	(.054)	(.054)
Change in Debt Equity Ratio		.00072	-.0061	.0057	-.0011	.0022	-.0054	-.0012	-.0056
		(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Method of Payment		.9	.91	.78	.83	.88	.9	.71	.77
		(.64)	(.64)	(.64)	(.64)	(.65)	(.64)	(.64)	(.64)
Deal Challenged		1.5	1.6	1.6	1.7	1.5	1.5	1.5	1.6
		(1.2)	(1.2)	(1.2)	(1.2)	(1.2)	(1.2)	(1.1)	(1.1)
Deal Friendly		-5.2***	-4.6**	-4.5**	-4.3**	-5.1***	-4.5**	-4.4**	-4.2**
		(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)
Target Hi-tech		-1.6*	-1.4*	-1.5*	-1.4*	-1.7*	-1.5*	-1.4*	-1.3*
		(.65)	(.64)	(.64)	(.64)	(.65)	(.65)	(.64)	(.64)
Gen. Alli. Exp: Acqr Gen. Alli Exp		-.1	-.62	-.081	-.48	-.25	-.76+	-.094	-.48
		(.42)	(.44)	(.42)	(.44)	(.42)	(.44)	(.41)	(.44)
Targ Gen. Alli Exp		.15	-1.7*	.1	-1.3	.28	-1.6*	.26	-1
		(.6)	(.79)	(.59)	(.81)	(.59)	(.79)	(.58)	(.81)
Rel. Ind Exp 1: Acqr RIA Exp. (Note1)		-.36	-.43	-1.4*	-1.1+				
		(.5)	(.5)	(.58)	(.59)				
Targ RIA Exp.		1+	.78	-.58	-.24				
		(.58)	(.58)	(.75)	(.76)				
Rel. Ind. Exp 2: Acqr ARIPA Exp. (Note 1)						.14	.0088	-1.5*	-1.2
						(.62)	(.61)	(.73)	(.74)
Targ ARIPA Exp.						.97	.55	-1.5	-1.2
						(.9)	(.89)	(1.1)	(1.1)
Acqr Gen.Alli.Exp * Targ Gen.Alli. Exp	H3		1.3***		.99*		1.3***		.91*
			(.37)		(.4)		(.37)		(.39)
Rel.Ind.Exp 1: Acqr RIA Exp * Targ RIA Exp	H4			1.2***	.82*				
				(.36)	(.39)				
Rel.Ind.Exp 2: Acqr ARIPA * Targ ARIPA	H4							2.5***	1.9**
								(.63)	(.68)
Regression constant		4.5*	4*	4*	3.8*	4.5*	4*	4*	3.8*
		(1.8)	(1.8)	(1.8)	(1.8)	(1.8)	(1.8)	(1.8)	(1.8)
Sample Size		505	505	505	505	505	505	505	505
R-Squared		0.094	0.118	0.115	0.126	0.091	0.115	0.120	0.129
Adjusted R-Squared		0.049	0.072	0.068	0.078	0.046	0.069	0.074	0.082
Model F		2.1**	2.6***	2.5***	2.7***	2**	2.5***	2.6***	2.7***

Standard errors are given in parentheses.　　　　　　　　　　　　　　　　[ROA_15]

All models include year dummies (not shown) with 1988 as the omitted year.

Note 1: RIA and ARIPA are alternative measures of Related Industry Alliance experience.

+ 　p < .1;
* 　p < .05;
** 　p < .01;
*** p < .001.

Table 2b: Intra-firm Perspective of Cross-form Effect

Dependent Variable: ROA Change	Model: Hyp	(1)	(2)	(3)	(4)	(5)	(6)
Industry Median Change in ROA		1.1	.85	.92	1.1	.78	.92
		(.91)	(.89)	(.9)	(.91)	(.89)	(.9)
Relative Acquisition Size		-.065	-.068+	-	-.061	-.066+	-.065
		(.041)	(.04)	(.04)	(.041)	(.04)	(.04)
Acqr to Targ Relatedness		1	1.5	1.2	.76	1.4	.99
		(1.1)	(1.1)	(1.1)	(1.1)	(1.1)	(1.1)
Acqr Acquisition Experience		.13	.096	.12	.11	.084	.11
		(.11)	(.11)	(.11)	(.11)	(.11)	(.11)
Targ Acquisition Experience		.1	.11	.14	.12	.1	.15
		(.2)	(.2)	(.2)	(.2)	(.2)	(.2)
Change in Sales		-.034	-.039	-.043	-.034	-.041	-.043
		(.055)	(.054)	(.054)	(.055)	(.054)	(.054)
Change in Debt Equity Ratio		.00072	.0067	.0093	.0022	.0059	.01
		(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Method of Payment		.9	.73	.72	.88	.69	.73
		(.64)	(.64)	(.64)	(.65)	(.64)	(.64)
Deal Challenged		1.5	1.8	1.7	1.5	1.7	1.7
		(1.2)	(1.1)	(1.2)	(1.2)	(1.1)	(1.2)
Deal Friendly		-5.2***	-4.2**	-4.6**	-5.1***	-4.1**	-4.5**
		(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)
Target Hi-tech		-1.6*	-1.4*	-1.4*	-1.7*	-1.3*	-1.4*
		(.65)	(.64)	(.64)	(.65)	(.64)	(.65)
Gen. Alli. Exp: Acqr Gen. Alli Exp	H1	-.1	-.82+	-1.6*	-.25	-.82+	-1.7*
		(.42)	(.46)	(.69)	(.42)	(.44)	(.68)
Targ Gen. Alli Exp		.15	-.92	-2.4+	.28	-.73	-2.3+
		(.6)	(.78)	(1.4)	(.59)	(.73)	(1.4)
Rel. Ind Exp 1: Acqr RIA Experience (Note 1)	H2	-.36	-1.8**	-.58			
		(.5)	(.64)	(.51)			
Targ RIA Experience		1+	.035	.92			
		(.58)	(.69)	(.58)			
Rel. Ind. Exp 2: Acqr ARIPA Experience (Note 1)	H2				.14	-2*	-.29
					(.62)	(.85)	(.63)
Targ ARIPA Experience					.97	-.7	.92
					(.9)	(1.1)	(.89)
Rel. Ind Exp 1: Acqr Gen. Alli Exp * Acqr RIA Exp	H5		.69***				
			(.2)				
Targ Gen. Alli Exp * Targ RIA Exp			1.3*				
			(.56)				
Rel. Ind Exp 2: Acqr Gen. Alli Exp * Acqr ARIPA	H5					.85***	
						(.25)	
Targ Gen. Alli Exp * Targ ARIPA						2.2*	
						(.91)	
Gen. Alli. Exp: Acqr Gen. Alli Exp * Acqr Gen. Alli	H6			.47*			.46*
				(.18)			(.19)
Targ Gen. Alli Exp * Targ Gen. Alli				1.4*			1.5*
				(.7)			(.7)
Regression constant		4.5*	3.7*	4*	4.5*	3.7*	4*
		(1.8)	(1.8)	(1.8)	(1.8)	(1.8)	(1.8)
Sample Size		505	505	505	505	505	505
R-Squared		0.094	0.132	0.118	0.091	0.133	0.114
Adjusted R-Squared		0.049	0.085	0.070	0.046	0.086	0.066
Model F		2.1**	2.8***	2.5**	2**	2.8***	2.4***

Standard errors are given in parentheses   [ROA_15]

All models include year dummies (not shown) with 1988 as the omitted year.

Note 1: RIA and ARIPA are alternative measures of Related Industry Alliance experience.

+ $p < .1$;

* $p < .05$;

** $p < .01$;

*** $p < .001$.

Paper Three:

Do Strategic Alliances Create Value for Bond Investors?

ABSTRACT

Prior studies have found that the formation of strategic alliances creates value for stock holders. In this study I analogously apply theories of coinsurance from the merger literature to strategic alliances and find that bond holder wealth also increases at the announcement of alliances. Through an event study of 725 announcements of US industrial firms which formed alliances in the period 2003 to 2007, I find evidence of coinsurance effects on the bonds of these firms. In particular, I find that bond holders of firms with below investment grade credit ratings benefit more than those rated investment grade. In accord with earlier literature, I also test for organizational learning effects by regressing prior alliance experience on bond returns however I find no such learning effects.

1. INTRODUCTION

Empirical research has confirmed that strategic alliances in general create value for stock investors (McConnell and Nantell, 1985; Chan, Kensinger, Keown, and Martin, 1997). But do they also create value for bond investors? The published studies to date have been silent on this question. Given the much larger size of the corporate bond market compared with equities, lack of attention to the value creation potential for the debt investors is indeed surprising. For example, during the decade 1997 to 2006, US corporations issued $4.6 trillion in corporate bonds compared with $1.5 trillion in new and seasoned equity issues (Bessembinder and Maxwell, 2008). The lack of research on the effects of strategic alliances on corporate debt may be partially explained by difficulties obtaining reliable trade data on corporate bonds. As of 2002, trade data on US corporate bonds became publicly available through the introduction of the Transaction Reporting and Compliance Engine (TRACE) database, opening research opportunities in this area[1].

To illustrate the effects of a strategic alliance announcement on both stock and bond holder wealth, on 31 July 2007, CableVision (CV) Systems Corp and CNET Network (CN) Inc "formed a strategic alliance to provide cable television services in the United States. CV and CN launched "CNET TV-Powered by Optimum" for iO digital cable customers on channel 607. The said free channel features hours of product reviews, commentary shows like the Top 5, Insider Secrets and Prize Fight" (SDC Platinum database). On this day, CV's stock registered a 91.7 basis points abnormal return or a gain of 79 million dollars, while its bonds registered a 212 basis point abnormal return or a 21 million dollar gain (absolute returns were even higher). Clearly

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[1] As of July 2002, bond dealers were required to report all trades in publicly issued US corporate bonds to the National Association of Security Dealers, which in turn made transaction data available to the public (Bessembinder and Maxwell, 2008).

in this instance and in many like it, the gains to both stock and bond investors are quite significant. With the number and extent of strategic alliances continuously increasing, attention to the value creation potential for both investor classes is important. Before the turn of the century, almost 20,000 alliances were reported globally (Anand and Khanna, 2000); by 2005, SDC Platinum Alliances and Joint Ventures data base reported over 50,000 pending or completed alliances; and in 2012 in spite of the global financial crisis a Deloitte Corporate Development survey reported that more than half the surveyed executives believed their firm would increase alliance activity.

A strategic alliance is a cooperative agreement or contract between two or more independent firms to commit and combine a subset of their resources for mutual benefit (Parkhe, 1993; Das and Teng, 2000a). An alliance is more than a simple market buyer-supplier agreement implying a certain level of exclusive access to the committed resources above and beyond such market agreements (Kogut, 1988). The nature of alliances can be described as a continuum where at one extreme are equity joint ventures in which two or more parent firms agree to invest and establish a separate legal business entity, while at the other extreme are cooperative agreements in which firms work together on specified common activities. The SDC Platinum database offers a practical definition for alliance contracts types by dividing them according to joint ventures, licensing agreements, and strategic alliances. For this paper, I include all three contract types under the generic term *strategic alliance*.

Strategic alliances are in some ways similar to mergers and acquisitions (hereafter mergers) and may be considered alternate forms of combining firm resources (Yin and Shanley, 2008; Wang and Zajac, 2007; Villalonga and McGahan, 2005). Like mergers, firms can combine through alliances their tangible physical assets or intangible knowledge assets (Das and Teng, 2000b; Kogut, 1988). In ways similar to mergers,

asset combinations through alliances have the potential to create value for investors because of synergies such as greater economies of scale, pooling of knowledge, and reducing risk (Hennart, 1988). As an alliance develops, partnering firms learn and co-develop new tangible and intangible assets that have future value creation potential (Simonin, 1997; Dyer and Singh, 1998). Through strategic alliances, firms acquire knowledge both for the common benefit of the alliance and for their own private benefit (Khanna, 1998; Larsson, Bengsston, Henriksson, and Sparks, 1998; Kumar, 2010a). They also learn to acquire knowledge more efficiently from their partners (Inkpen and Crossan, 1995; Kale, Dyer, and Singh, 2002; Anand and Khanna, 2000).

However, strategic alliances are different to mergers because the management executives of the partnering firms continue to keep their jobs and are required to cooperate to ensure the alliance's success. While mergers are able to eliminate inefficient or ineffective management, those of partnering firms are required to overcome the tensions working internally with each other and externally with their competitive business environments (Das and Teng, 2000a). The relationship between allying firms is thus forced to co-evolve along these two dimensions, making it unstable and prone to failure (Doz, 1996; Ring and Van de Ven, 1994; Inkpen and Currall, 2004).

McConnell and Nantell (1985) was the earliest study to draw the analogy between mergers and alliances and the similar effect they have on stock holder returns. Many subsequent studies (e.g. Das, Sen, and Sengupta, 1998; Johnson and Houston, 2000; Anand and Khanna, 2000; Gao and Iyer, 2009; Amici et al, 2013) all imply the existence of this "merger-alliance analogy". However, like McConnell and Nantell's study, the focus has almost exclusively been on the wealth effects on stock holders.

To my knowledge no study has looked at the effect of alliance formation on bond holder wealth. If there is an effect, can the same merger-alliance analogy be used to explain it? The aim of this paper is to study the effect of strategic alliance announcements on bond investor wealth and develop the merger-alliance analogy as it applies to corporate bonds. Specifically, in this paper I aim to answer three basic sets of questions: (1) Do strategic alliances create value for the bond investors of allying firms? (2) If so, how is value created for them? Is the merger-alliance analogy useful?

Since firms may engage in multiple alliances, scholars have been interested in whether firms learn from this alliance experience and whether there is a positive effect on firm performance measured by excess stock returns (e.g. Anand and Khanna, 2000; Kale, Dyer, and Singh, 2002). With the aim of seeing how far the merger-alliance analogy goes, I also aim to answer another basic question: (3) Do firms exhibit positive alliance learning effects from their prior alliance experience as measured by bond performance as they do by stock performance? Where are the limits of the merger-alliance analogy?

Based on theories from the merger literature that explain the effects of co-insurance on bond holder wealth, I show that the merger-alliance analogy can be extended to explain the effects of strategic alliances on bond holder wealth. Using a sample of 725 strategic alliance announcements by US industrial firms during the period January 2003 to December 2007, I show that bond holders like stock holders in general benefit from alliance formations [2,3]. Moreover, in a similar way to the bond holders of merging firms, I show that the bond holders of firms that form alliances experience co-insurance effects in two ways. Firstly, bond holders of allying firms with

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[2] The 725 observations include firm-alliance announcements made in the sample period where each firm has both outstanding stocks and bonds. However, as bonds do not trade daily, the actual sample size of the bond sample reduces to 467 bond observations of which 435 have complete firm-level data.

[3] As explained further in Section 3, for firms with multiple bond issues outstanding, I combine them into one single firm-bond. Thus a "bond" refers to a firm-level bond outstanding, or one bond per firm.

below investment grade bonds benefit more than those of firms with investment grade bonds; and secondly, bond holders of allying firms benefit from strategic alliances when focal firms increase their level of financial leverage following the alliance formation. However, I find at least one limit to the merger-alliance analogy. While prior researchers have found a positive correlation between the organizational learning effects from prior alliance experience and value creation for stock holders, I find no such correlation between alliance experience and bond holder value creation.

The rest of the paper is organized as follows. In section 2, I develop in more detail the theory that explains the merger-alliance analogy and propose five hypotheses. In section 3, I explain the data and empirical methods used to test the hypotheses. In the section 4 the results are shown, and in section 5 I provide a brief discussion of the results and end with some conclusions about directions for future study.

2.   THEORY AND HYPOTHESES

Table 1 presents some of the key theoretical and empirical studies that suggest what I refer to as the "merger-alliance analogy", which I define as the application of theories describing the effects of asset combinations under mergers to asset combinations under alliances[4]. The early finance literature (i.e. the studies that appear in both the stock holder and bond holder columns of Table 1) developed the theoretical foundations of how mergers affected the wealth of merging firms' stock and bond holders. Later researchers, in particular McConnell and Nantell (1985) applied the merger-alliance analogy to study the effects of alliance announcements on stock holder wealth. Most other studies that follow McConnell and Nantell imply the existence of the analogy, but again they only study of the effects on stock prices. However, no study that

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[4] Like all analogies, some things are similar while others are different.

I am aware of has extended this analogy to explain the effects of alliances on bond prices.

Table 1: Key theoretical and empirical literature that suggest a "merger-alliance analogy"

Wealth effect ⇨ Literature ⇩	*Stock holders*	*Bond holders*
Mergers *(Theoretical* *foundations)*	• Levy and Sarnat (1970) • Lewellen (1971) • Higgins and Schall (1975) • Galai and Masulis (1976) • Asquith and Kim (1982)	• Levy and Sarnat (1970) • Lewellen (1971) • Higgins and Schall (1975) • Galai and Masulis (1976) • Asquith and Kim (1982) • Kim and McConnell (1977) • Billett, King, and Mauer (2004) • Penas and Unal (2004)
Alliances *(Empirical studies)*	• McConnell and Nantell (1985) • Koh and Venkatraman (1991) • Das, Sen, and Sengupta (1998) • Chan, et al (1997) • Anand and Khanna (2000) • Johnson and Houston (2000)	*Can the merger-alliance analogy extend the literature to describe the effects of alliances on corporate bonds?*

2.1   Stocks and merger-alliance analogy

Two principal motives help explain the effect of merger announcements on stock holder wealth (Jensen and Ruback, 1983; McConnell and Nantell, 1985). First, mergers are driven by a "synergy creation" motive, such as increases in economies of scale, gains from combining complementary assets, increases in market size and power, increases in efficiencies in marketing and product distribution, and better deployment of existing assets. The second is a "management displacement" motive, which are the gains made by replacing the ineffective or inefficient management of the acquired firm. However in a merger, isolating the effects of these two motives on stock holder wealth can be empirically challenging.

Combining a subset of assets of two or more firms in an alliance, on the other hand, provides an opportunity to separate the effects of the synergy motive from the management displacement motive (McConnell and Nantell, 1985). McConnell and Nantell (1985) show that the announcements of strategic alliances have similar effects

on stock holder wealth as do announcements of mergers, with substantial positive excess returns benefitting the stock investors of the allying firms. They are also of the opinion that the gains to stock holders come from synergies created by the alliance.

Further empirical research has shown that the principal motive firms form alliances is indeed to generate synergies (Johnson and Houston, 2000). Lack of synergy creation under an alliance's cooperative management is in fact a motive for alliance dissolution or acquisition (divestment) of one partner's share by (to) another. Such are the internal tensions between partners and the external pressures between each firm and its business environment that a lack of sustainable value creation for at least one of the partners will lead to a renegotiation of the alliance agreement or its eventual break up (Kogut, 1989; Ariño and de la Torre, 1998; Das and Teng, 2000a).

2.2   Bonds and merger-alliance analogy

The theoretical finance literature suggests that bond holders in corporate mergers should experience significant positive wealth effects. Levy and Sarnat (1970), Lewellen (1971), and Higgins and Schall (1975) argue that mergers increase bond holder wealth through a financial effect called *co-insurance*. Simply stated, co-insurance is the increase in value of outstanding bonds (1) because of the greater security offered by the larger asset base of the merged firm, and more importantly (2) because the combination of the imperfectly correlated cash flows of the two merging firms reduces the volatility of the merged firm's cash flows, which in turn reduces bond default probabilities. Co-insurance thus effectively increases the debt capacity or ability of the merged firm to support higher levels of financial leverage.

Galai and Masulis (1976) further argue that if the merger is non-synergistic, bond holder's wealth will increase by an amount that is exactly offset by the decrease in

wealth of stock holders. If the aim of firm management is to protect stock holder wealth, Kim and McConnell (1977) argue that firms would increase *financial leverage* after the merger to offset the losses incurred by stock holders in order to expropriate back lost wealth, effectively neutralizing the merger's co-insurance effect. Other scholars have also argued that because of the effects of coinsurance, the bond holders of firms with a lower *credit rating* will benefit more from a merger because of an average decrease in risk while firms with a higher credit rating will lose more because an average increase in risk (Shastri, 1990; Dennis and McConnell, 1986; Billett, King, and Mauer, 2004).

Therefore, a merger-alliance analogy that describes the effects of alliance formation on bond holder wealth should include the four effects discussed above that are found in mergers, namely the *coinsurance effect*, *credit rating effect*, *synergy effect*, and *financial leverage effect*. I do so in the following three points.

First, if we start by assuming that an alliance formation is non-synergistic and that there are no expected changes in financial leverage, then just as the coinsurance effect has a positive effect on the bond holder wealth of merging firms which combine all their assets, we should also expect a positive effect on bond holder wealth of allying firms which combine a subset of their assets[5]. The increase in bond holder wealth will be accompanied by a concomitant decrease in stock holder wealth, i.e., a wealth transfer between investor classes.

Furthermore, if we continue to assume a non-synergistic alliance and no financial leverage, allying firms with bonds that have a lower credit rating will on average experience an *additional* increase in their bond holder wealth. Allying firms with bonds that have higher credit ratings, on the other hand, will on average experience

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[5] This assumes that allying firms contribute a significant part of their assets to the alliance. For example, in a dyadic alliance in which the firms agree on an equal share of the alliance benefits, the greater the portion of each firm's assets that are shared in the alliance, the greater will be the coinsurance effect on the bonds of these firms.

a decrease in their bond holder wealth. In sum, assuming non-synergistic alliances, the group of allying firms with lower credit rating will experience positive coinsurance and positive credit rating effects, while group of allying firms with higher credit rating will experience positive coinsurance and negative credit rating effects.

Second, if we believe that alliance formations are synergistic and still with no changes in financial leverage, then for stock holders to whom will accrue the positive wealth effects of the synergies, there will be some compensation for negative coinsurance effects of the alliance. The stock holders of allying firms should therefore experience on average either a net positive or net negative wealth effect. For the bond holders of allying firms, regardless whether or not they receive any synergy benefits[6], the positive coinsurance effects should mean that the net wealth effect for this class of investors is either net positive or zero. Given the empirical evidence that support the synergy creation motive of alliances (McConnell and Nantell, 1985; Johnson and Houston, 2000), we should expect that there is at a *non-negative* effect on bond holder wealth when alliances are announced. The net effects on investor wealth discussed so far can be summarized in Table A.

Table A: The net wealth effects of coinsurance, credit rating and synergy given that alliances are synergistic

	Bond holder wealth		*Stock holder wealth*	
Higher relative credit rating	Coinsurance effect	+	Coinsurance effect	−
	Credit rating effect	+	Credit rating effect	0
	Synergy effect	0	Synergy effect	+
Lower relative credit rating	Coinsurance effect	+		
	Credit rating effect	−		
	Synergy effect	0		

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[6] In general, bond holders should not expect to receive any of the benefits of synergy. I discuss this in a little more detail in Paper One of this dissertation in the section on DCF applications to alliances.

Thus in the absence of transfers of wealth between stock and bond holders because of synergies, and given the large body of evidence that stock holders on average benefit from strategic alliance formations, I hypothesize the following:

Hypothesis 1: Strategic alliances create value for both stock and bond holders of the same firm.

Hypothesis 2: Strategic alliances create more value for bond holders of firms with lower credit rated bonds than those with higher credit rated bonds.

Third, in general financial leverage has a positive effect on stock holder wealth because of the tax benefits of debt and a neutral effect on bond holder wealth so long at the level of leverage is not too high. However, if the financial leverage of a firm is high, then as in mergers, bonds of a highly leveraged firm forming an alliance should experience a reduction in default risk when combining it is assets with a less leveraged firm and are therefore expected to experience a positive wealth effect, while bonds of the less leveraged firm should experience a negative wealth effect (Billett, King, and Mauer, 2004). I thus hypothesize as follows:

Hypothesis 3: High levels of firm leverage at the announcement of an alliance will be positively correlated with the value creation for bond holders.

Forming an alliance may be a positive signal to investors of improvements in the future growth and cash flows of the firm. This would mean an increase in its ability to

support more debt financing, i.e., increased debt capacity. If investors foresee this, bond values will rise. Hence I hypothesize as follows:

Hypothesis 4: Positive changes in the level of firm leverage after forming a strategic alliance will be positively correlated with value creation for bond holders.

While the previous four hypotheses focus on finance related aspects of how bond holder wealth may be affected by alliance formations, previous research from the strategy literature has shown the prior alliance experience affects the performance of firms' stock returns (Anand and Khanna, 2000). The question that arises then, is does the merger-alliance analogy extend to include these organizational learning effects as well? The next section looks at this question.

2.3   Organizational learning and bond holder wealth

In all organizations, new knowledge enables experimentation and innovation, which brings renewal and opportunities to increase competitiveness (Inkpen, 1998). The competitive advantage of firms rests on their ability to create new knowledge (Kogut and Zander, 1992). Because of these competitive pressures, firms may turn to their alliance partners as a source of new knowledge (Sampson, 2007). Knowledge acquired from alliances can be used for mutual benefit of the alliance but also private benefits outside the alliance (Khanna, 1998; Kumar, 2010a). Alliances can therefore be as much a source of gaining competitive advantage as of losing it, giving rise to learning races between alliance partners (Khanna, Gulati, and Nohria, 1994).

However, firm's that have a greater ability to learn from their alliance partners, i.e., superior alliance capability, will not only tend to win these races but also have

greater ability to take advantage of the knowledge acquired for their private benefit. Additionally, while knowledge resource complementarity is in itself important for creating alliance synergies, the effective integration and management of the shared resources is even more important to realize the synergies intended (Harrison, et al, 2001). Thus the building of alliance capability through an alliance learning process that involves articulation, codification, sharing and internalization of the know-how required to manage alliances is an important avenue through which firms maintain competitive advantage (Kale and Singh, 2007; Heimeriks and Duysters, 2007). As well as having a dedicated alliance management function within the firm, alliance capability is developed as firms gain experience forming alliances (Anand and Khanna, 2000).

As a cooperative agreement, firms have a choice of the resources and knowledge they commit and share with their alliance partners. As some cooperative agreements such as equity joint ventures tend to require a closer collaboration and a firmer commitment, the resources and knowledge committed should be subject to fewer restrictions than other forms of alliances such as a licensing agreement. However, on the whole, we should expect that the more alliance experience a firm has, the more will be the benefits achieved from subsequent alliances.

The benefits of learning from alliances as well as the increased ability to learn because of alliance experience are synergies that positively affect all investors of the firm, not only through increased future opportunities and greater competitiveness, but also greater financial ability to generate future cash flows and service higher levels of debt. Accordingly I propose the final hypothesis.

Hypothesis 5: Learning effects from strategic alliance experience creates more value for bond holders in alliances with greater resource commitment such as joint ventures.

The five hypotheses, if supported, will be evidence that bond holders are affected in the same way as stock holders. If true, they will also help extend the merger-alliance analogy to include bond holders.

3. DATA AND METHODS

3.1 Data

Sources: My sample is built from merging together data from five different data base sources: TRACE US Corporate bond data, Mergent FISD bond issue data[7], SDC Platinum alliance data, CRSP stock prices, and COMPUSTAT firm-level data. I limit to US based alliances by industrial firms that have issued US dollar dominated corporate bonds. The period of data is from 1 July 2002 until 31 December 2007. The starting date coincides with the beginning of the TRACE bond data and the ending date is chosen to avoid the events of the 2008 global financial crisis.

Defining Partner A vs. Partner B: The main empirical objective of this paper is to investigate whether firms that form alliances create or destroy value for their bond holders. In order to ensure that the value created (or destroyed) for bond holders is not transferred to or from either the stock holders of the same firm or the stock or bond holders of the partner firm, I need to statistically test for possible value transfers between these asset groups (see Tests for Value Creation vs. Value Transfer)

Few alliances involve firms with outstanding corporate bonds and even fewer still involve firms in which more than one of the partner firms in the alliance have outstanding bonds. Each observation of my sample is a single alliance announcement

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[7] "FISD" stands for the Fixed Income Securities Database provided by Mergent.

containing data for "Partner A" firms and "Partner B" firms. I select all "Partner A" firms to have valid return data for *both* their stocks and bonds, while "Partner B" firms usually only have valid stock data. After employing data cleaning routines described below, the final Partner A sample contains 725 firm-events or alliance announcements, while the final Partner B sample contains 262 firm-events. There are only 22 observations in which both Partner A and B have valid stock and bond data, and only 5 observations which involve more than two alliance partners (i.e. partners A, B, and C) and for which I have valid return data.

Of the 725 announcements, all 725 firms have outstanding stock that trade daily. However very few bonds trade daily, reducing the sample of bond returns to 467 observations (on Day 0, which is used for regression analysis). Removing those firms with no valid firm-level data, the bond sample size reduces further to 435 observations.

Data Cleaning: Prior research has reported problems with the accuracy of the alliance announcement dates reported in the SDC Platinum Alliance database (Anand and Khanna, 2000; Schilling, 2009). For the alliance announcement dates in my sample, I cross-checked against Lexis-Nexis and if there was a disagreement in the dates I used the earliest one between the two data sources, which meant usually deferring to the media source within Lexis-Nexis. For other data items such as SIC codes and types of alliance, I used what was reported in SDC given that this data is for the most part quite accurate (Anand and Khanna, 2000).

Also using Lexis-Nexis, confounding events during the event window meant that certain alliance announcement observations had to be discarded. These events included the firm's financing events (dividend announcements, seasoned issues, stock splits, etc), strategic events (merger announcement, multiple alliance announcements,

changes in senior management positions, etc), and major operational events (major new project announcements, major customer changes, earnings announcements, etc).

Bond return data: As the principal results of this study hinge on the analysis and interpretation of corporate bond return data I provide a more detailed explanation about how this data was prepared. Unlike stock return data which is easily available through WRDS and CRSP, firm-level bond return data needs to be assembled and calculated separately. Given the particular nature and trading characteristics of corporate bonds, such as thin trading, a market dominated by institutional investors, multiple issues by the same firm, non-fungibility[8], limited maturity, etc, certain adjustments need to be made in the procedure, as will be discussed in some detail here.

Reliable and publicly accessible US corporate bond data is now available via WRDS in the TRACE[9] fixed income database. TRACE's data coverage began on 1 July 2002 and by 2004 extended to include over 99% of all corporate bond trades representing 95% of traded dollar value (Glushkov, 2007). The Mergent FISD provides complementary bond issue information, such as coupon rates and credit rating histories for example, that is not as available in TRACE.

The initial intersection of the TRACE, SDC, and FISD databases yields more than 8000 strategic alliances in which at least one of the partners had bond data in TRACE. To be included in the Partner A sample, I followed criteria similar to those

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[8] Common stocks of a firm, for example, are fungible because each share is exchangeable for another, whether bought at IPO or in a seasoned issue or through the secondary market. Different bond issues, however, may not be interchangeable with other issues even by the same firm as each issue differs in seniority, coupon rate, maturity, credit rating, etc, which means that they are not completely fungible.

[9] TRACE is the Trade Reporting and Compliance Engine and is available through the Wharton Research Data Service (WRDS). Its purpose is to increase transparency in the corporate bond, agency bond, asset-backed and mortgage-backed securities markets through the accurate and timely distribution of fixed income data, including real-time dealer price quotes, trade volumes, yield offers, etc. In January 2001, the SEC approved rules that obliged all US corporate bond over-the-counter (OTC) secondary market trading to be reported through TRACE. It is owned and operated by FINRA, the Financial Industry Regulatory Authority, the largest regulator for all securities firms doing business with the US public (TRACE Factbook, 2011).

used by Bessembinder, Kahle, Maxwell, and Xu (2009) and Elton, Gruber, Agrawal, and Mann (2001): (a) Only bonds issued by industrial firms are included; (b) Only straight coupon and variable coupon rate bonds are included, eliminating those with special features for example, bonds that are putable, callable, sinking fund, index bonds, etc; (c) Daily observations with an absolute value of returns greater than 20% are excluded; (d) All bonds must have a corresponding credit rating and maturity index amongst the Barclays Capital (formerly Lehman Brothers) corporate bond indices.

There are several empirical challenges conducting an event study on corporate bonds (see Bessembinder, et al, 2009) that require certain adjustments to the standard event study methodology. First is the problem of thin trading. Unlike equities which trade almost daily, bonds trade at a wide range of frequencies. Some large issues may trade daily, but the majority of issues do not. Furthermore, unlike stock trading, bond trading is dominated by institutional or large investors resulting in wide range of prices depending on dollar volume of trades. The lack of liquidity in the bond market requires care in calculating the abnormal returns required for the event study. Secondly, unlike equities where each firm typically has only one outstanding issue, firms often have multiple bond issues each with its own return series. For the purposes of this study, I combine abnormal bond returns of multiple issues from the same firm into a single value-weighted abnormal bond return (following Bessembinder et al, 2009; Billett, King, and Mauer, 2004). Thirdly, unlike stocks which are theoretically perpetual assets, the time to maturity of bond issues progressively decreases, such that their value is less sensitive to risk factors[10]. Finally, while daily trade data is the norm in equities, earlier research using bond data has been typically with monthly data. Since the advent of the TRACE fixed income database, daily trade data is now easily available to researchers.

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[10] To illustrate, where present value of future cash flow (PVFCF) = $FCF/(1+\text{discount rate})^t$ and t is the time to maturity of the bond, PVFCF becomes less sensitive to changes in the discount rate as t decreases.

Using daily bond data significantly increases the power of statistical tests to detect shocks (Bessembinder, et al, 2009).

I use daily TRACE data for this paper, implementing several "TRACE cleaning" routines suggested by Bessembinder and colleagues[11]. These include eliminating non-institutional trades and building daily trade-weighted bond prices for each issue's time series, which I use to calculate the issue's returns series. To check robustness, I use three different amounts to define the magnitude of institutional trades, starting from as low as $10,000, then $50,000 and finally $100,000, which is what Bessembinder et al, use. The results I show are based on the $100,000 definition. Access to the Mergent FISD database[12] allows me to calculate the actual daily bond returns as described in Bessembinder et al (2009: 4226):

$$Bond\ Return_{(Actual)}\ =\ BR_{it} = \frac{(P_{it} - P_{i,t-1}) + AI}{P_{i,t-1}} \qquad (1)$$

where *AI* is the accrued interest and P_{it} is the bond price for issue *i* on day *t*. Accrued interest is the coupon interest that is owing to the bondholder but not yet paid since the last coupon date. Since trade prices are in practice quoted as "clean prices" (i.e. *P*), adding the accrued interest is closer to the actual price received by the bond seller (i.e. "dirty price"). In order to calculate a return, valid prices on two consecutive trading days are required. Due to thin trading, the number of calculable bond returns is substantially less than the trades made.

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[11] See Footnote 7 of Bessembinder, et al (2009). It refers to a SAS program used for bond data cleaning. I introduce improvements to correct errors in the original program, which include inadvertently deleting some observations, not deleting other observations, and inappropriately excluding some trades. The improved program is available on email request.

[12] I would like to acknowledge and thank the School of Banking and Finance at the Australian School of Business, University of New South Wales, for giving me access to their extensive database services.

3.2 Empirical methods

Event Study: For the stock event study around the event day, defined as day 0, I use the standard event study method with a 255 day estimation period ending 15 days prior to event day, followed by a 5 day gap period, and then a 21 day event period or window (-10, +10). I use a standard SAS program with adjustments available through WRDS (Glushkov, 2011) and use the market model estimation method.

For the bond event study, I use the standard methodology with the following adjustments (see Boehmer, Broussard, and Kallunki, 2002). I estimate the model parameters for each bond issue over a 126 trading day estimation period ending 15 days prior to the announcement date of the alliance followed by a 5 day gap period. I use a matched portfolio model according to equation (2) (following Elton, et al, 2001; and Bessembinder, et al, 2009), where BR_{it} is the actual bond return on day t, α_{i0} and α_{i1} are the issue-specific model parameters to be estimated, *MatchedIndex$_{it}$* is the Barclays Capital bond index that was matched with the bond issue according to similar credit rating and time to maturity, and ε_{it} is the error term that is assumed to be i.i.d normal with zero mean. Because of infrequent trading of corporate bonds, there may be concerns over the quality of the abnormal return estimates of the event period because of potentially poor quality parameter estimates that are based on infrequent return data during the estimation period. To allay this concern, like Bessembinder, et al (2009), I discard bond issues that had less than 10 trades in the last 20 days of the bond's estimation period[13]. During the estimation, I obtained a corresponding estimate of the variance for each issue, which I later used for hypothesis testing.

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[13] To be clear, the key time points of the set up are: -20, -15, -10, 0, and 10 days in event time which correspond to: the start of the last 20 days in the estimation period during which there needs to be 10 or more trades for the issue to considered valid, the start of the gap period, the start of the event period, the event day when the alliance is announced, and the end of the event period.

$$BR_{it} = \alpha_{i0} + \alpha_{i1}(MatchedIndex)_{it} + \varepsilon_{it} \qquad (2)$$

In the 21 day event period (-10, +10), I calculate the excess or abnormal returns for each issue according to equation (3), where AR_{it} is the abnormal return of bond issue i on day t, and $\widehat{\alpha_0}$ and $\widehat{\alpha_1}$ are the estimates of the parameters.

$$AR_{it} = BR_{it} - [\widehat{\alpha_0} + \widehat{\alpha_1}(MatchedIndex)_{it}] \qquad (3)$$

For firms with multiple bond issues, I combine the issues of the same firm into a value-weighted portfolio to make one firm-bond. I calculate the combined portfolio variance according to standard portfolio theory assuming a correlation coefficient of 1 (see Brealey, Myers, and Allen, 2008). As a result, all bonds in the sample can be considered firm-bond issues, i.e., one bond per firm.

CAR vs. Daily AR vs. Pooled AR: In order to calculate a cumulated abnormal return (CAR), it is necessary to have a non-missing AR on each consecutive day of the CAR window. However, because of the infrequent trading of bonds, this is usually not possible for the full 21 day event window. In my sample, about one third of the bonds do not have return data on any one trading day during the event window, and if the missing returns on days of no trading were replaced with zero return values, the return distribution will be radically distorted. Although short CAR windows, for example (-2, 2) or (-1, 1) are possible, once again there is the problem of interpreting results based on a substantially reduced sample observations. In sum, although some results using CAR as a measure for performance are provided for robustness, these are not considered the main ones. Instead, in this study I use daily abnormal returns (Daily AR) and pooled abnormal returns (Pooled AR) of several days for hypothesis testing.

Tests for Value Creation vs. Value Transfers: To test whether Partner A bond holders benefit from the value creation effects of strategic alliances, I need to ensure that (1) value is not being transferred from the Partner A stock holders of the same firm (intra-firm transfers); (2) value is not being transferred from its alliance partner, Partner B's stock holders (inter-firm transfers); and (3) value is being created contemporaneously and not simply across the entire cross-section of firm-bonds (contemporaneous transfers). To test for these conditions, I estimate the regression equation given in equation (4) that links the abnormal returns of each of these three investor groups.

$$AR(bond_A, t) = \beta_1 AR(stock_A, t) + \beta_2 AR(stock_B, t) \qquad (4)$$

where AR(. , t) is are the abnormal returns of the Partner A bond in the sample, Partner A stock sample, and Partner B stock sample, while β_1 and β_2 are the respective coefficients estimated using OLS.

How should these coefficient estimates be interpreted? If the average abnormal return of bond A is positive and significantly different from zero and $\beta_1 > 0$, then the abnormal returns of the stock and bond holders of Partner A are correlated and the alliance deals can be considered in general to be value creating for both stock and bond holders of Partner A. If however, $\beta_1 < 0$, then the stock and bond returns of Partner A would be moving in opposite directions to each other, in which case would be evidence of value transfer between stock and bond holders.

If again the average abnormal return of bond A is positive and significantly different from zero and $\beta_2 > 0$, then the alliance announcements are causing abnormal returns of Partners A and B to move in the same direction and can be considered value creating for both partners. However, if $\beta_2 < 0$, then the returns of Partners A and B would be moving opposite directions which would imply that either value is being

transferred between the two partners' investors or there is an unequal sharing of value in the value creation of the alliance.

Cross-sectional analysis of bond returns: In order to explain the effects of strategic alliance announcements on abnormal returns on bonds, I estimate the cross-sectional regression given in equation (7).

$$
\begin{aligned}
\overline{AR}_0 \quad = \quad & \gamma_0 \\
+ \quad & \gamma_1 \text{ (Credit rating dummy: Non-investment = 1)} \\
+ \quad & \gamma_2 \text{ (Financial leverage ratio prior to alliance)} \\
+ \quad & \gamma_3 \text{ (Change in leverage over -1, +1 years)} \\
+ \quad & \gamma_4 \text{ (Alliance experience by alliance type in past 6 years)} \\
+ \quad & \gamma_5 \text{ (Control: Book Value of assets, Market to Book Value)} \\
+ \quad & \gamma_6 \text{ (Control: Relative Size)} \\
+ \quad & \gamma_7 \text{ (Other Controls: Year of Alliance, Alliance Industry, Firm)} \quad (7)
\end{aligned}
$$

Credit Rating: I define the dummy variable Non Investment Grade that takes the value 1 if the alliance one has a Moody's credit rating of Ba1 or lower, or 0 otherwise. According to Hypothesis 2, a positive coefficient estimate is expected.

Leverage ratio: Leverage ratio is defined as the fiscal year-end ratio of book value of debt to total firm value (Ghosh and Jain, 2000). The book value of debt is equal to the sum of book value of long-term debt and the debt in current liabilities. Total firm value is defined as sum of the book value of debt and the market value of equity. I calculate this ratio with the fiscal year-end data one year prior to the alliance announcement. A positive co-efficient estimate is predicted.

Change in leverage: Two definitions are used to test this variable. The first is the difference between the leverage ratio one year after the alliance formation and the leverage ratio one year before all divided by the leverage ratio one year before. The

second definition is the leverage ratio one year after the alliance announcement divided by the leverage ratio one year before. A positive coefficient estimate is expected.

Alliance experience: Anand and Khanna (2000) find that experience from prior strategic alliance experience significantly explains the returns of stocks following the alliance announcement. The number of prior alliances includes those in the past 6 years to the focal alliance. A longer period of experience could have been chosen, although this may call to question the relevance of alliance experience measured further in time from the focal event. I calculate a separate experience variable for each of the three alliance contract types, namely Joint Ventures, Strategic Alliances, and Licensing Agreements.

Controls: Since larger firms have more resources, they may have a stronger co-insurance effect, hence I control for the firm size effects with the *book value of assets* in the fiscal year-end prior to the alliance announcement.

Firms with a higher market to book ratio have greater growth opportunities and hence greater potential for synergy creation in an alliance, hence I control for *market to book ratio*, where market value is the market value of outstanding common and preferred shares.

As smaller partners of an alliance may benefit relatively more than the larger partner, I control for *relative size effects* with the ratio of the Partner B firm's total assets divided Partner A's total assets.

I control for the *year, industry of the alliance,* and *firm fixed effects*. I use the Fama French 49 Industries to categorize the industry of the alliance.

4.   RESULTS

4.1   Descriptive results

Table 2a provides details of the number of alliances carried out in the full sample of 725 Partner A firm-alliance announcements. IBM Corp has the most number of alliance announcements with 55 alliances in the sample during the sample period representing 7.7% of the entire sample. The top 10 and top 20 firms each make up 39% and 52% (268 and 364 announcements) respectively of the full sample while the last 100 firms make up 14% (100 announcements) of the sample. Tables 2b and 2c provide further descriptive details about the nature of the strategic alliances involved.

Table 2a: Alliance announcements by the top 10 firms for Partner A sample (Jul 2002 to Dec 2007)

The full sample consists of Partner A alliance announcements made by 185 unique firms. Each of the firms has outstanding bonds that trade on at least one day during the event period (-10, 10). Although I report 725 observations with alliance announcements in the period, three have missing data in various parts of the analysis.

Number of alliance Announcements	Portion of sample	Firm Name	CUSIP6
55	7.68%	IBM Corp	459200
45	6.28%	Merck & Co Inc	589331
37	5.17%	Motorola Inc	620076
31	4.33%	Pfizer Inc	717081
24	3.35%	Bristol-Myers Squibb Co	110122
23	3.21%	Hewlett Packard Co	428236
14	1.96%	Cisco Systems Inc	17275R
14	1.96%	DuPont	263534
13	1.82%	Lockheed Martin Corp	539830
12	1.68%	Lucent Technologies Inc	549463
457	60.9%	(others)	
TOTAL: 725	**100.0%**		

Table 2b: Strategic alliance announcements by year and type

As the TRACE bond database began on 1 July 2002 and an estimation period of 126 trading days was used to estimate the model parameters, the earliest alliance announcements began in 2003.

Year Announced	Strategic Alliance	Joint Venture	Licensing
2003	78	6	14
2004	61	12	22
2005	116	14	36
2006	128	24	31
2007	136	16	31
TOTAL	**519**	**72**	**134**

Table 2c: Strategic alliance announcements by industry and type

The industries are based on the Fama French 49 industries definitions.

Industries	Strategic Alliances	Joint Ventures	Licensing
Business services	207	6	50
Computer Software	137	1	6
Wholesale	50	2	7
Telecommunication	23	1	.
Electronic equipment	20	4	.
Pharmaceutical products	10	1	3
Autos	9	8	.
Retail	8	.	1
Petroleum and natural gas	7	1	.
Entertainment	6	.	1
Real estate	3	1	.
Restaurants, hotel, motel	3	5	.
Apparel	2	.	.
Chemicals	2	13	.
Computers	2	1	.
Others	30	28	66
TOTAL	**519**	**72**	**134**

4.2   Event study results

Table 3 shows the parallel event study results of daily abnormal returns (AR) of Partner A bonds and stocks and Partner B stocks for each event day during the 21 day event period window (-10, 10). Comparing the daily sample sizes of the three asset groups shows that almost all 725 Partner A and 262 Partner B stocks trade daily. The sample of Partner A bonds is between 422 and 467 observations, however the reality is that the sample composition changes significantly each day reflecting the fact that corporate bonds trade less frequently than the stocks of the same firms.

For the Partner A bonds, there appears to be some evidence of leakage of information prior to the event day with positive and significant abnormal returns on day -3 for both the mean and median estimates (0.115 bp[14] with p<.05 and 2.753 bp p<.05). Also on day -3, this same leakage seems to be reflected in the opposite direction for the

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[14] One "bp" or basis point is equal to one hundredth of one percent, i.e. 1 bp = 0.01% = 0.0001.

Partner B stocks registering negative and significant mean and median returns (-37.133 bp with p<.05 and -25.014 bp with p<.05).

Hypothesis 1: The most significant result of Table 3 is the simultaneously positive and highly significant cross-sectional abnormal returns on day 0 for Partner A bonds, Partner A stocks, and Partner B stocks with respective means of 8.5 bp, 38.9 bp, and 267.3 bp all significant at p<.001 with medians of 3.4 bp, 11.8 bp, and 52.8 bp respectively. The stock reactions of the Partner A and Partner B firms are on the low and high side respectively compared with earlier studies. For instance, McConnell and Nantell (1985), Chan, et al (1997), Anand and Khanna (2000) obtain 74 bp, 64 bp, and 67 bp respectively for their full samples means.

One explanation for the difference in means with earlier studies is firm size. In order to issue corporate bonds at reasonable interest rates, issuers, which include all the Partner A firms, tend to be larger and more stable firms. Large firms tend to have a lower abnormal return market reaction but a much higher dollar return, while smaller firms show the reverse pattern (see McConnell and Nantell, 1985: 531). Looking at Panel A of Table 6 confirms this. Partner A firms have a high dollar return market reaction of 79.7 million dollars on day 0 (but a relatively low abnormal return), while Partner B firms have a comparatively low dollar reaction of only 22.5 million dollars (but a high abnormal return). These dollar reactions can be compared with Anand and Khanna (2000: 305) which reports a mean dollar reaction of 44 million dollars (and a mid-range abnormal reaction) for their sample of joint ventures whose parent firms may or may not have had outstanding bonds.

These results lend some support to Hypothesis 1 which argues that the formation of strategic alliances will be beneficial for both stock and bond holders of allying firms,

but it is not conclusive. It is possible that the Partner A bond and Partner A stock means are cross-sectionally positive and significant on a particular event day, but anti-correlated within each pair of same firm bond and stock abnormal returns, implying a transfer of value between different investor classes of the same firm. Furthermore, Partner A and Partner B investors may be benefitting differently from the alliance.

The regression shown in equation (4) tests for these possibilities and the results are shown the last three columns of Table 3. The positive and highly significant β_1 on many days of the event window indicate that the Partner A bond and stock abnormal returns are moving in the same direction. This is stronger evidence in support of Hypothesis 1, that strategic alliances create value for both stock and bond holders of the same firm. However, the estimates of β_2 are insignificant on most days of the event window except on day 0.

For robustness, Table 5 presents results based on cumulative abnormal returns (CAR) in a similar parallel event study to that shown in Panel A of Table 4. In all tests, only β_1 is positive and significant while β_2 is statistically not different from zero. For reasons explained earlier, these results are less reliable due to loss of observations in working with CAR, however, the results still support Hypothesis 1.

Hypothesis 2: Panel A of Table 4 provides the same parallel event study as Table 3 but for pooled abnormal returns. The regression coefficient estimates in the last three columns of the table show a common pattern of statistically significant and positive β_1 and negative β_2. However, when splitting the full sample into sub-samples according to the Moody's investment grade credit rating of the Partner A bond as I do in Panels B1 and B2 of Table 4, only statistically significant and positive β_1 are found in the non-investment grade group (Panel B2), while only statistically significant and

negative β_2 are found in the investment grade group (Panel B1). This is evidence that credit rating makes a difference to bond holder returns on the formation of an alliance.

Focusing on Panel B1 of Table 4, Partner A bonds and Partner A stock still show positive and significant pooled abnormal returns, although these returns are not significantly correlated as indicate by the insignificant coefficient β_1 estimate. On the other hand, the significant negative β_2 coefficients and significant positive means for Partner A bonds and Partner B stock together indicate that Partner B stock is earning much more relative to Partner A bonds, hence the negative sign on the coefficient. I conclude that for allying firms with investment grade bonds, value is created for both stock and bond holders of those firms. Furthermore, the strategic alliance creates much more value in terms of abnormal returns for Partner B stock holders than Partner A stock holders due to a relative size effect, as described above.

Looking at Panel B2 of Table 4 and in particular AR(0,0) corresponding to day 0 in event time, Partner A bonds and stocks and Partner B stocks all have positive and significant mean and median abnormal returns as well as positive and significant β_1 estimates. Again I conclude that for allying firms with non-investment grade bonds, value is created for both stock and bond holders of those firms on the alliance announcement day. However, the β_2 coefficient is insignificant, indicating that the strategic alliance again creates value for both Partner A and Partner B investor, although the value creation is not correlated.

Panels B1 and B2 of Table 6 show the corresponding dollar gains for the sub-samples by investment grade. For Partner A firms with investment grade bonds, bond

holders lose money by an average of 1.2 million dollars (median 0.70 million dollars)[15],

while those with non-investment grade bonds benefit significantly with an average gain

of 7.6 million dollars (median 0.95 million dollars).

In sum, compared with non-investment grade bonds, investment grade bonds

display smaller abnormal returns and smaller dollar returns. Taken together, the

evidence strongly confirms Hypothesis 2.

4.3   Regression Results

Tables 7a and 7b provide the results of multivariate regression model expressed

in equation (7). Table 7a presents the leverage effects on Partner A abnormal bond

returns, and Table 7b presents the organizational learning effects.

Hypothesis 3: In Table 7a, Model 1 is the full sample model of 435 firm-bond

abnormal return observations controlling for year and industry fixed effects but not firm

fixed effects. The positive and significant coefficient for Credit Rating once again

confirms Hypothesis 2. However, the negative and significant coefficient for Leverage

Ratio (-0.0125, p<.001) is the opposite of what is predicted in Hypothesis 3. Model 2 is

the same as model 1 but controls for relative size between the Partner B and Partner A

firms. It also shows the same negative correlation for the coefficient on Leverage Ratio

as model 1. However, in models 3 and 4, which control for firm fixed effects, the

Leverage Ratio coefficient estimate becomes insignificant. Table 7b shows that across

all three models, the estimated coefficients on Leverage Ratio are also consistently the

opposite of what is predicted by Hypothesis 3, although these models do not control for

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[15] That the median of the dollar gain of investment grade bonds is positive and that the sample contains
large firms that skew the mean together suggest that the mean is actually not significantly different from
zero.

firm fixed effects. Given this fairly consistent result, especially when not controlling for firm fixed effects, it would seem that either the statistical model is incorrectly specified or in fact the opposite of Hypothesis 3 is the case; that high levels of leverage of firms that form alliance is seen by bond investors as an increase in risk for these firms, decreasing the value of bonds.

Hypothesis 4: Model 1 in Table 7a is the only model to show that the Change in Leverage Ratio is positive and statistically significant (0.00347, p<.01). This is at best weak evidence that supports Hypothesis 4.

Controlling for firm fixed effects seems to have a strong effect on the results as reflected, amongst other things, in the dramatic change in the R-squared values of models 1 and 3. Other models (not shown) were also shown to be "adversely" affected by the addition of this control variable. Further investigation is required.

Hypothesis 5: None of the models of Table 7b show that learning effects from prior alliances had an effect on bond abnormal returns. I conclude that there is no support for Hypothesis 5.

5.   DISCUSSION & FURTHER RESEARCH

Hypothesis 3 predicted that because of coinsurance effects high levels of firm leverage would be correlated with positive increases in bond holder returns on the announcement of alliances, but the results revealed otherwise. An interesting explanation for this could be that what is happening here is not really a coinsurance effect, but rather a trade-off theory effect (Myer, 1977; Brealey et al, 2008). Trade-off theory says that firms will increase their level of debt to the point where the marginal tax benefits due to debt will be traded for the marginal losses due to financial distress, at which point the firm will maximize its overall value. Increasing debt levels beyond this

point (*ceteris paribus*) means that debt holders will be put more at risk, which leads to a reduction in debt value and therefore firm value. What may be happening when a firm announces its new alliance is that the bond investors sees that the alliance will require more investment which, in the absence of increasing equity, risky debt will have to be issued putting more strain on the debt capacity of the firm. In other words, while the alliance announcement of highly leveraged firms may be beneficial for stock holders, it is not for existing and future bond holders.

I follow this line of thought a bit further. Because of the growth options that come from alliances (Reuer and Tong, 2010; Kogut, 1991; Chi, 2000) and the fact that the market value of equity and debt is equal to the sum of the value of the assets in place (AiP) and the growth opportunities (GO), i.e. $E + D = V_{AiP} + V_{GO}$ (Myer, 1977), what may be happening is that firms with high levels of debt are actually unable to invest in the growth opportunities or real options that the alliance would otherwise bring them because of its cash constraints. As investors foresee this constraint, debt becomes more risky if the firm goes ahead with the alliance. This may explain the results that are contrary to the prediction of Hypothesis 3. Further research on this point may reveal some interesting findings[16].

Hypothesis 5 predicted that organizational learning from alliance experience would positively affect bond holder returns, however this was not supported. One possible explanation for this is that while strategic factors such as the development of knowledge assets or firm capabilities are beneficial for stock holder wealth, they are not directly beneficial for bond holder wealth. Development of strategic assets that strengthen competitive advantage affect the growth options of the firm, and these benefits go to stock holders (in the absence of the risks of high leverage discussed

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[16] I elaborate further on this point in the Research Gap 2b discussed in Paper One of this dissertation.

above). Bond holders are only affected indirectly in so far as debt is made less risky or the firm's debt capacity has increased. The difference is because stock holders are residual income owners of the firm, while bond holders are fixed-income owners of the firm and senior claimants to the firm's assets in the event of bankruptcy. In sum, the merger-alliance analogy seems only to be extendable at describing the effect of alliance formation on bonds in so far as how alliances affect the credit risk and debt capacity aspects of the firm. Strategic factors such as alliance capability and organizational learning capability, on the other hand, are explained by the merger-alliance analogy for stocks. Further investigation using other strategic variables as explanatory variables of bond returns following alliance announcements may be able to verify this limitation of the merger-alliance analogy.

6.   CONCLUSION

Based on theories of coinsurance that predict the effects of mergers on corporate bonds, I have argued that the merger-alliance analogy that was used to describe the effects of alliance formation on stock holder wealth can be extended to explain the effects of alliance formation on bond holder wealth. Through the results of an event study and regression analysis there is (1) strong evidence suggesting that the formation of strategic alliances creates value for both bond and stock holders of the same firm; (2) strong evidence to say that bond holders of allying firms with below investment grade bonds benefit more than bond holders of firms with investment grade bonds; and (3) some evidence to show that bond holders of firms that form alliances benefit when these firms have positive changes in the level of financial leverage following the alliance formation.

However, there seems to be a limit to how far the merger-alliance can explain bond holder reactions to alliance formations. Unlike the known positive effects that organizational learning from prior alliance experience has on stock holder wealth, it appears that alliance experience has no effect on bond holder wealth. This could be because of differences in the seniority claims between stock and bond holders. Stock holder wealth is affected more by changes in strategic factors while bond holder wealth is affected more by firm risk and debt capacity related factors.

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8.   RESULT TABLES

Table 3: Parallel Event Study: Daily Abnormal Returns of Partner A Stocks and Bonds vs. Partner B Stocks

$$\text{Regression: DailyAR(Bond}_A,t) = \beta_1\text{DailyAR(Stock}_A,t) + \beta_2\text{DailyAR(Stock}_B,t)$$

	Partner A BONDS			Partner A STOCKS			Partner B STOCKS			REGRESSION	
Event Time (in days)	No. of obs in sample	Partner A Bond Mean AR (basis points)	Partner A Bond Median AR (basis points)	No. of obs in sample	Partner A Stock Mean AR (basis points)	Partner A Stock Median AR (basis points)	No. of obs in sample	Partner B Stock Mean AR (basis points)	Partner B Stock Median AR (basis points)	No. of obs in sample	$\beta_1$estimate	$\beta_2$estimate
-10	450	2.899	0.733	725	3.765	-0.080	263	10.001	5.320	172	0.026	0.012
-9	467	3.022†	2.278	725	6.421	0.743	263	22.196	7.040	182	0.071*	0.023*
-8	463	0.495	1.780	725	0.380	-3.047	262	33.395†	-2.885	183	0.156***	0.011
-7	437	0.746	1.212	725	-1.242	-7.588	262	7.286	-6.836	168	0.151***	0.006
-6	447	-0.909	2.017	725	-0.503	-2.388	262	11.557	-7.408	176	0.098***	0.015
-5	453	-7.424	0.185	725	-9.361	-5.235	262	3.319	7.230	177	0.022	-0.002
-4	451	1.382	2.516	725	-1.128	-11.905	262	21.074	-4.252	181	-0.004	-0.004
-3	448	0.115*	2.753*	724	1.845	-5.910	262	-37.133*	-25.014*	174	0.064*	-0.027
-2	441	-1.708*	2.308	725	10.479	1.284	262	16.388	-5.232	169	0.043†	0.040
-1	453	-1.761	0.344	725	-3.688	1.333	261	2.722	16.662	171	0.233***	-0.028
0	467	8.527***	3.391**	725	38.891***	11.844**	262	267.294***	52.789***	183	0.145***	-0.019**
1	468	2.901*	2.990†	725	16.962*	5.279*	262	-6.411	3.519	191	0.175***	-0.009
2	446	1.400	2.365	725	4.162	-6.170	262	-47.692*	-2.287†	171	0.047	-0.008
3	455	2.052*	2.237	723	-2.564	-3.994	262	23.567	-5.018	172	0.052	-0.025
4	427	0.693	2.681	721	6.826	3.658	261	3.401	11.922	167	0.112**	0.019
5	443	-7.479	1.417	721	-16.043*	-13.998**	261	-12.813	-0.556	174	0.459***	-0.022
6	447	-6.221	-0.661	721	-10.854	-9.052	261	36.456†	2.583	175	0.208***	0.004
7	438	-2.165	1.107	720	4.236	-3.448	261	-23.810	-16.232*	169	-0.152**	0.025
8	422	-3.868	-0.044	719	11.916†	-4.115	261	-9.004	-12.532	169	0.098**	0.033
9	427	6.527†	2.800	719	-9.351	-8.336*	261	10.314	-5.144	174	0.044†	0.023
10	431	5.660	1.250	717	10.531	3.356	260	2.154	5.913	162	0.080***	0.013

Statistical significance p-levels (two tail tests): † p<.1; * p<.05; ** p<.01; *** p<.001. Stock means tests: Brown & Warner (1980); Stock median tests: Wilcoxon Ranked Sign; Bond means tests: Sign Test; Bond median tests: Wilcoxon Ranked Sign.

Table 4: Parallel Event Study: Pooled Abnormal Returns of Partner A Stocks and Bonds vs. Partner B Stocks

Regression: PooledAR(Bond$_A$,t) = β$_1$PooledAR(Stock$_A$,t) + β$_2$PooledAR(Stock$_B$,t)

	Panel A: Partner A Bond Grade=ALL GRADES											
	Partner A BONDS			Partner A STOCKS			Partner B STOCKS			REGRESSION		
Pooling of Abnormal Returns	No. of obs in sample	Partner A Bond Mean AR (basis points)	Partner A Bond Median AR (basis points)	No. of obs in sample	Partner A Stock Mean AR (basis points)	Partner A Stock Median AR (basis points)	No. of obs in sample	Partner B Stock Mean AR (basis points)	Partner B Stock Median AR (basis points)	No. of obs in sample	β$_1$ estimate	β$_2$ estimate
Pooled AR(-1,1)	1388	3.272***	2.514**	2175	17.389***	5.800**	785	87.977***	18.327**	545	0.180***	-0.018**
Pooled AR(-2,2)	2275	1.940***	2.514***	3625	13.361***	2.770*	1309	46.494***	9.289	885	0.139***	-0.013†
AR(0,0)	467	8.527***	3.391**	725	38.891***	11.844**	262	267.294***	52.789***	183	0.145***	-0.019**
Pooled AR(0,1)	935	5.711***	3.210**	1450	27.927***	7.925***	524	130.442***	20.848***	374	0.156***	-0.018**
Pooled AR(0,2)	1381	4.319***	3.052***	2175	20.005***	4.036*	786	71.064***	11.928†	545	0.142***	-0.016*
	Panel B1: Partner A Bond Grade=INVESTMENT											
Pooled AR(-1,1)	1019	0.750***	2.367**	1572	9.792**	4.185*	608	105.512***	18.104**	437	0.018	-0.021***
Pooled AR(-2,2)	1679	-0.808***	2.235***	2620	4.830†	2.318	1014	57.729***	9.505†	710	0.020	-0.019***
AR(0,0)	345	1.178**	2.560*	524	16.713**	10.263*	203	313.681***	55.172***	147	0.015	-0.018***
Pooled AR(0,1)	688	1.294***	2.831**	1048	11.792**	6.248*	406	154.152***	19.289**	301	0.006	-0.020***
Pooled AR(0,2)	1023	0.357***	2.584**	1572	7.359*	3.058	609	83.155***	10.121	439	0.014	-0.018**
	Panel B2: Partner A Bond Grade=NON-INVEST											
Pooled AR(-1,1)	369	10.237	4.353	603	37.193**	14.255†	177	27.744	19.274	108	0.270***	-0.022
Pooled AR(-2,2)	596	9.681	4.111†	1005	35.603***	4.736†	295	7.876	8.070	175	0.195***	0.027
AR(0,0)	122	29.307*	10.269*	201	96.708***	18.949*	59	107.691**	32.778*	36	0.247***	-0.043
Pooled AR(0,1)	247	18.014†	6.655†	402	69.989***	21.688**	118	48.861*	23.250	73	0.242***	-0.018
Pooled AR(0,2)	358	15.639†	6.399†	603	52.973***	7.028*	177	29.463	17.970	106	0.223***	-0.009

Statistical significance p-levels (two tail tests): † p<.1; * p<.05; ** p<.01; *** p<.001. Stock means tests: Brown & Warner (1980); Stock median tests: Wilcoxon Ranked Sign; Bond means tests: Sign Test; Bond median tests: Wilcoxon Ranked Sign.

Table 5: Parallel Event Study: Cumulative Abnormal Returns of Partner A Stocks and Bonds vs. Partner B Stocks

Regression: $CAR(Bond_A, t) = \beta_1 CAR(Stock_A, t) + \beta_2 CAR(Stock_B, t)$

	Partner A BONDS			Partner A STOCKS			Partner B STOCKS			REGRESSION		
CAR (day start, day end)	No. of obs in CAR sample	Partner A Bond Mean CAR (basis points)	Partner A Bond Median CAR (basis points)	No. of obs in sample	Partner A Stock Mean CAR (basis points)	Partner A Stock Median AR (basis points)	No. of obs in sample	Partner B Stock Mean CAR (basis points)	Partner B Stock Median CAR (basis points)	No. of obs in sample	β_1 estimate	β_2 estimate
CAR(-2,2)	109	-17.901	6.255	109	78.210*	2.136	109	69.850	0.494	109	0.073**	0.013
CAR(-1,1)	147	17.502*	6.348†	147	93.020***	13.400†	147	93.807*	51.575*	147	0.200***	-0.022
CAR(0,1)	169	23.833†	4.189†	169	111.382***	46.210**	169	177.840***	72.894***	169	0.213***	-0.017
CAR(0,2)	143	11.831	2.639	143	113.199***	13.345*	143	144.329**	38.871†	143	0.137***	-0.007

Statistical significance p-levels (two tail tests): † $p<.1$; * $p<.05$; ** $p<.01$; *** $p<.001$. Stock means tests: Brown & Warner (1980); Stock median tests: Wilcoxon Ranked Sign; Bond means tests: Sign Test; Bond median tests: Wilcoxon Ranked Sign.

Table 6: Wealth Effects on Day 0 of Strategic Alliance announcement

	Partner A BONDS				Partner A STOCKS				Partner B STOCKS			
Event Time (days)	Number of firm-bonds in daily portfolio	Partner A Bonds Outstdg -15 days	Partner A Bonds Mean Dollar Gain	Partner A Bonds Median Dollar Gain	Number of stocks in daily portfolio	Partner A Stocks Outstdg -15 days	Partner A Stocks Mean Dollar Gain	Partner A Stocks Median Dollar Gain	Partner B Number of stocks in daily portfolio	Partner B Stocks Outstdg -15 days	Partner B Stocks Mean Dollar Gain	Partner B Stocks Median Dollar Gain
Panel A: Partner A Bond Grade=ALL GRADES												
0	467	2,998.460	1.089	0.817	725	53,122.627	79.663	11.507	262	28,941.869	22.503	2.840
Panel B1: Partner A Bond Grade=INVESTMENT												
0	345	3,432.789	-1.198	0.702	524	71,129.820	108.946	26.333	203	24,239.402	16.645	2.960
Panel B2: Partner A Bond Grade=NON-INVEST												
0	122	1,866.177	7.556	0.949	201	6,178.501	3.321	2.680	59	44,851.883	42.658	1.686

Outstanding values and Dollar gains are in millions of dollars. Outstanding bond values are based on issued amounts outstanding. Outstanding stock values are based on market values of outstanding stock. Dollar Gain equals the Day 0 stock (bond) abnormal return (AR) multiplied by the outstanding value of stocks (bonds) 15 days before the alliance announcement day, Day 0. Wealth effects are calculated based on a single day AR (Day 0) as their calculation based on CAR for bonds are distorted by the infrequent trading of bonds. See AR(0,0) in Table 4 for the mean and median AR that correspond with mean and median Dollar Gains of this Table.

Table 7a: Regressing Partner A Bond AR against Leverage

Day 0 Abnormal Return:	Model 1	Model 2	Model 3	Model 4
Credit Rating (Non Invest=1)	0.00736***	0.00858***	0.00909**	0.0319***
	(0.0014)	(0.0020)	(0.0029)	(0.0051)
Leverage Ratio	-0.0125***	-0.0131**	-0.00648	0.0175
	(0.0028)	(0.0042)	(0.0091)	(0.018)
Chg in Lev. Ratio	0.00347**	-0.000423	-0.00152	-0.000702
	(0.0012)	(0.0017)	(0.0012)	(0.0019)
Assets	1.65e-08*	2.43e-08*	4.52e-08*	1.98e-08
	(7.6e-09)	(0.0000)	(0.0000)	(0.0000)
Market to Book	-0.0000601	-0.00000831	0.000170**	0.000376***
	(0.000059)	(0.000074)	(0.000061)	(0.000098)
Rel size PtnB/PtnA		0.000229***		-0.000871*
		(0.000023)		(0.00038)
Constant	0.00459	0.00428	-0.00246	-0.00601
	(0.0083)	(0.0072)	(0.0091)	(0.011)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	Yes
Observations	435	173	435	173
R^2	0.200	0.554	0.707	0.855

Standard errors in parentheses; $^+ p < .1$, $^* p < .05$, $^{**} p < .01$, $^{***} p < 0.001$
Model 2 and 4 have fewer observations because not every Partner A observation has the corresponding Partner B data.

Table 7b: Regressing Partner A Bond AR against Alliance Experience

Day 0 Abnormal Return:	Joint Ventures	Strategic Alliances	Licensing Agree.
Credit Rating (Non Invest=1)	0.0158*	0.00704***	0.00753+
	(0.0069)	(0.0015)	(0.0042)
Leverage Ratio	-0.0301+	-0.0125***	-0.0307**
	(0.017)	(0.0030)	(0.010)
Chg in Lev. Ratio	-0.00505	0.000163	0.00364
	(0.0088)	(0.0015)	(0.0024)
JV Experience prior 6 yrs	0.00119		
	(0.0012)		
SA Experience prior 6 yrs		-0.0000125	
		(0.000014)	
LIC Experience prior 6 yrs			0.0000232
			(0.00022)
Assets	-2.25e-08	2.47e-08**	-1.70e-08
	(0.0000)	(8.3e-09)	(0.0000)
Market to Book	0.00165	0.0000537	-0.00155***
	(0.0016)	(0.000058)	(0.00025)
Constant	-0.0105	0.00212	0.0161**
	(0.0098)	(0.0077)	(0.0055)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Firm fixed effects	No	No	No
Observations	42	318	75
R^2	0.888	0.108	0.579

Standard errors in parentheses; $^+ p < .1$, $^* p < .05$, $^{**} p < .01$, $^{***} p < 0.001$
The full sample 435 bond AR observations are split according to alliance contract type.

Conclusion

Contributions & Limits
Reflections
Future Directions

CONCLUSION

The integration of the two traditional fields of strategy and finance is an immense and continuous task that is still occupying the interest of scholars from both fields. While there may be the temptation to discard important ideas that lie at the foundations of either field in order to achieve this integration, scholars have so far resisted it. The three papers I have presented in this dissertation follow their approach, which is based on a mutual respect for the research traditions of each one.

1.   CONTRIBUTIONS AND LIMITATIONS

Paper One reviewed relevant theories and methods in the strategy and finance literatures on the subject of strategic alliances taking organizational learning and financial valuation perspectives. The literature on strategic alliances, especially in the strategy literature is vast, while those from the finance literature are much less numerous. The review aimed to contribute to the literature stream that bridges the gap between strategy and finance by identifying theories and methods that are of common interest. I then identified research gaps which became the focus of Papers Two and Three of this dissertation and of future research work.

Paper Two studied how a firm's experience in one governance form, namely in forming and managing alliances could be transferred to positively affect the performance of another governance form, namely acquisitions. Acquisition performance is measured over a three year period using change in return on assets (ROA), a long-term financial variable based on accounting data. The paper contributes to the strategy literature by identifying two different mechanisms through which the transfer of alliance experience takes place to positively affect acquisition performance. The paper proposes

a way of measuring the accumulated related industry prior alliance (ARIPA) experience as a more effective way of capturing how the prior alliance experience is transferred.

Paper Three investigated the effect of strategic alliance formations on the wealth of bond holders of allying firms by developing an analogy between mergers and alliances based on theories of coinsurance. The key findings were that like stock holders, bond holders are also positively affected by the announcement of alliances because of coinsurance, and that firms with below investment grade bonds benefit more than those with investment grade bonds when an alliance is announced. The study found no relationship between organizational learning from prior alliance experience and bond holder value creation, indicating there are some limits to how far the analogy between mergers and alliances can be taken when applied to bonds. The findings contribute to the finance and strategy literatures by filling a gap in the understanding of how alliances affect the debt holder class of investors.

The findings of the three Papers presented in this dissertation are not without their limits and defects. I list three here, but the list is by no means complete:

- *Too general*: A major limitation of the research conclusions presented is their overly general nature. The lack of focus on specific industries within the industrial and manufacturing sectors that were studied in Papers Two and Three leaves the reader wondering about the usefulness of the findings beyond pure academic interest. An industry-level benchmark could be more useful to practioners and academics to compare against. In future revisions especially of Paper Two, closer attention should be paid to the industry effects and other relevant sub-samples that may reveal more specific and relevant conclusions.

- *Insufficient robustness*: Paper Two for example, lacks robustness in the calculation of the prior alliance experience variables. Perhaps more checks on

different versions of the ARIPA calculations would provide stronger verification of the results and hence robustness of the conclusions. Paper Three, while it provides interesting results, more robustness tests and checks are still needed to make them conclusive. For example, Table 4 requires tests of differences between sub-sample means in Panels B1 and B2 to ensure there really are differences between abnormal returns of investment and non-investment grade bonds.

- *Insufficient inclusion*: Although the Papers presented in this dissertation aim to bridge the gap between strategy and finance through the common subject of strategic alliances, the majority of the literature has been drawn from the strategy field. While the sample of papers may be representative of the amount of research attention given by the respective fields to alliances, going beyond these two may be beneficial in bridging the gap between them. For example, alliance literature is also found in other fields such as economics, psychology, sociology, and political science. Although it would be beyond the scope of this or any dissertation to include literature from all these fields, acknowledgement of their existence and contribution could make the dissertation more complete and inclusive, in particular Paper One.

2. REFLECTIONS

When I first decided to focus my doctoral dissertation on strategic alliances, one of the main tasks was to review the extant literature, especially in both strategy and finance. It soon became clear the large differences in the amount of research attention given to alliances between the two fields. The question I had from the very early on was why the principal finance journals have so little on alliances? Based on my own

experience and through discussions with various finance scholars who conduct research on alliances, I would like to share the following answer to this question.

At least three issues seem to limit alliance research, at least for finance scholars: (1) *Lack of firm-level data*: while general public data on announcements of alliances, what they intend to do, the industries they are from, etc, which are available from widely used databases such SDC Platinum, there is a lack of firm-specific data that allows finance researchers to gauge the size of alliance activity. For example, how much firms invest in alliances, the portion of sales or profits that are due to alliances, the prices paid to buy out an alliance partner's share, etc. This sort of data is usually only accessible through exclusive sources. (2) *Alliances are not M&As*: Alliances are like the "poor cousins" of M&As. M&A is where the money is, especially given that the market for corporate control is serviced by large investment banks and consulting firms which have an interest to engage clients in large high profile M&As over short timeframes. Alliances on the other hand, require long-term relationship building between the allying firms, something that a third party such as an investment bank or consultant plays less of a role. And (3) *different research cultures*: The dominant mathematical, empirical, and transaction cost economics-based theories that pervade the finance literature are not what you find in strategy. While rigorous empirical research in strategy may employ for example, survey or case-based data, empirical research in finance is reticent to take what it would consider a leap of faith. These differences in research cultures are strong and I have observed this by the lack of cross-citations between the two literatures.

3. FUTURE DIRECTION

I would like to conclude my doctoral dissertation on a personal note regarding my future professional direction of research. My reflections on the state of development

of strategic alliance research in the strategy and finance literature continue shaping the direction I intend to take in my research work on this subject. As finance and strategy scholars have found, the research gaps that bridge the two fields are many and the opportunities tempting.

At the end of Paper One, I identified two in particular. One of the research gaps was more oriented to strategy and I have begun working in it by contributing the findings of my Paper Two. I have also interested other scholars to join me in research projects in this gap. The other research gap was more oriented to finance and again I have already begun to contribute to filling the gap through the results of my Paper Three. Like the first gap, this one continues to be of keen interest for my future research work on alliances.

While my personal research interests lie in both strategy and finance, in general however, my preference is more tilted in favor of finance. The types of questions that I will be directing my future research efforts include some of the following areas:

- How do alliances affect corporate debt, especially bank debt?

- How are alliances financed? Debt, equity, or retained earnings?

- How do alliances affect the risk of firms? Various measures would be interesting to know including bond rating, stock volatilities, beta estimates, etc.

- How has the capital structure of firms changed over the past 30 years as a function of the growth in alliances?

Ian P.L. Kwan
Pamplona, 2013
Deo Gratias!