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Interlocking Alliances

A quantitative exploration of board interlocks and strategic alliances

Navn: Tarek Ziad Abdul-Hadi, Kim Andre Ophus

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## Abstract

This study explores the relationship between board interlocks and strategic alliances. Our introduction identifies the abovementioned link as an overlooked relationship and justifies the reasoning behind this study. Our theoretical framework introduces the notion that a board interlock has potential benefits for strategic alliances. Specifically, we study the influence of board members' ties to external firms on the alliance participation propensity of the focal firm. Moreover, we identify alliances where the partners share a board member and define alliances with this characteristic as interlocking alliances. Finally, we study the effect of this characteristic on the alliance performance in terms of abnormal returns accruing to the partners.

We find that an expansion of the board by one member increase the propensity of alliance participation by 3 %. We also find that an increase by one additional board interlock increase the propensity of alliance participation by 3 %. The search of interlocking alliances resulted in five observations, suggesting this as a rare occurrence. Due to the small sample size, the performance measurements did not hold any statistical significance. However, the observed abnormal returns were fluctuating between negative and positive.

Implications of these findings for the literatures on board interlocks and strategic alliances are discussed. Our study contributes to the strategic management literature by the identification of interlocking alliances, the effect of the board on alliance participation propensity, and by drawing the overlooked link between board interlocks and strategic alliance performance.

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## 1.0 INTRODUCTION

Research using board interlocks thrived with the burst of research on interorganizational relations. The leading issue in this research stream, then and now, is what interlocks do (Mizruchi, 1996). Early research on board interlocks is criticized for using interlocks as the one and only measure of inter-firm relationships (Lamb and Roundy, 2016). Thus, disregarding other forms of relations such as strategic alliances. We believe there is great potential in combining research on board interlocks with research on strategic alliances, and that it may give a more complete understanding of the nature between the two phenomena. Another critique against board interlocks studies, is that the impact of board interlocks on firm performance is inconsistent. In order to draw the overlooked link mentioned above, we explore the nature between board interlocks and strategic alliances. Specifically, we study the relationship between board interlocks and alliance participation and measure the performance of firms participating in an alliance, which are connected through a board interlock. We have chosen to define alliances with this characteristic as “interlocking alliances”.

Gulati and Westphal (1999) are among the few scholars who address board interlocks in relation with strategic alliances. They explore the influence of the social network of board interlocks on the creation of joint ventures between firms on a dyadic level. They find that board interlocks can either increase or decrease the likelihood of alliance formation between interlocking firms. However, alliance formation as an outcome of board interlocks has not to our knowledge been researched on an aggregated level. We therefore identify a research gap in terms of board interlocks effect on alliance participation on a general level.

Our study aims to connect the two measures of inter-firm relationships; board interlocks and strategic alliances. More specifically, we intend to quantitatively explore the relationship, and hope to contribute to the research areas of board interlocks and strategic alliances. Hence, our research question is:

***To what extent do board interlocks influence participation and performance of subsequent interlocking alliances?***

We use a logistic regression model in order to explore potential effects that the board of directors may have on alliance participation. In addition, we apply event studies' methodology and use abnormal returns as a measurement of the performance of firms participating in an interlocking alliance (MacKinlay, 1997; Villalonga and McGahan, 2005; Oxley, Sampson and Silverman, 2009).

The results indicate that the board member variables, holds some explanatory power on firms alliance participation propensity. The firms number of board members and their respective links to other firms through interlocks, both indicate a 3 % increase in the probability of that firm participating in an alliance. The search for interlocking alliances granted a surprisingly low number of occurrences, with only five instances taking place in a six-year period, in the U.S. Furthermore, we did not identify any significant abnormal returns (ARs), or cumulative abnormal returns (CARs) for the aforementioned interlocking alliances. With the small sample size, we were not able to identify any significant effect of board interlocks on alliance performance, in terms of CARs. However, we do believe our findings provide guidance and ideas for new research opportunities, which we believe will further strengthen the understanding of the relationship between board interlocks and strategic alliances.

Our study is structured in the following way. The paper begins by establishing a literature standpoint by reviewing the relevant literature on board interlocks and strategic alliances. Within this review, we elaborate on previous literature which motivated us to look further into, and add, to the literature which combines the two paradigms. Findings from theories such as network theory, knowledge and trust suggest potential positive effects which board interlocks can impose on alliance participants. Further, we build our hypotheses based on the potential positive effects from the literature. Before the results and its subsequent discussion, we elaborate on our choice of methodology in terms of data sampling, analysis and statistical testing. Lastly, we discuss how our findings will be of value for future research and suggest areas which we believe could grant interesting contributions to the literature on strategic alliances and board interlocks.

## 2.0 LITERATURE REVIEW

In order to understand the nature between firms' boards of directors and strategic alliances, a review of relevant literature is essential. The review discusses argumentation grounded in strategic management research, especially surrounding board interlocks and alliances, but also including theories and concepts that are indirectly connected to our research question. The link between alliances and board interlocks is reviewed in light of previous research on the motives, incentives and drivers for successful alliances. The vibrant discussion in the literature opens for analysis of these drivers for success, and how we believe they could be affected by the presence of an interlocking directorate. The literature review below, will therefore closely examine theories of board interlocks and alliance performance, to illustrate what motivated us to investigate and study these phenomena combined.

### 2.1 BOARD INTERLOCKS

Board interlocks as a form of interorganizational influence receives widespread attention among scholars, and several theories on their effects are proposed. Board interlocks are defined as ties created by two firms sharing a common director (Mizruchi, 1996). Board interlocks works as a means for interfirm collusion and cooperation (Burt, 1983), they are a means for personal career progression (Zajac, 1988), they enable firms to reduce dependence or coopt, control and monitor other firms (Pfeffer and Salancik, 1978; Mizruchi, 1982; Mizruchi and Stearns, 1994), they support upper-class cohesion (Zeitlin, 1974; Palmer, 1983), they function as a signal of legitimacy (Selznick, 1957; DiMaggio and Powell, 1983), and they are a source of information (Useem, 1984; Davis, 1991; Haunschild, 1993). However, regardless of the extensive amount of research on board interlocks and their outcome, the subject of whether they actually influence the interlocked firms is still a subject of much debate, as research has produced mixed and conflicting findings (Palmer, Friedland and Singh, 1986; Palmer, Barber, Zhou and Soysal, 1995; Fligstein, 1995).

Board interlocks reflect complex inter-organizational relationships. Research suggests that board interlocks can help firms deal with environmental uncertainty and dependency (Useem, 1984), provide access to diverse and unique information (Haunschild and Beckman, 1998), and function as a sign of a quality (Higgins and



Gulati, 2003; Kang, 2008). Furthermore, board interlocks may be able to expedite processes, such as diffusion (Davis, 1991) and learning (Beckman and Haunschild, 2002), which can influence performance (Davis and Cobb, 2010; Hillman, Withers and Collins, 2009).

Lamb and Roundy (2016) suggests that board interlocks studies can be broadly classified as focusing on either the antecedents or the outcomes of board interlocks. Due to the focus of our study, this review is centered around outcomes and not antecedents. The focus of board interlock studies is the outcomes of interlock activities (Lamb and Roundy, 2016). Commonly examined outcomes of board interlocks has been the effect on minimizing environmental uncertainty, diffusing strategies, influencing the reputation of the organization, influencing firm performance (Lamb and Roundy, 2016), and influencing formation of joint ventures (Gulati and Westphal, 1999).

Several theories are applied when exploring the relation between board interlocks and firm performance. These include agency theory (Haniffa and Hudaib, 2006), social networks theory (Cai and Sevilir, 2012), inter-organizational theories (Keister, 1998) and social capital theory (Horton, Millo and Serafeim, 2012). Nevertheless, resource dependence theory is the theory that is most associated with finding positive influence on firm performance. Board interlocks can help firms to obtain resources and information that may improve performance (Davis and Cobb, 2010). Another point is that board interlocks can facilitate alliance formation, which in turn can give access to resources that can improve firm performance (Gulati and Westphal, 1999). Research suggests that firms that are embedded in the network of the directors can leverage social relations to perform economic exchanges, which can result in improved firm performance (Granovetter, 1985; Horton et al., 2012).

On one hand, several studies find that board interlocks have a positive relation to firm performance (Cai and Sevilir, 2012; Haniffa and Hudaib, 2006; Harris and Shimizu, 2004). On the other hand, there are studies that propose contradicting results (Fich and White, 2005). For example, firms with fewer board interlocks perform better than firms with more board interlocks (Fligstein and Brantley, 1992). The relationship between board interlocks and firm performance is inconsistent and

complex. One study shows a positive relationship between an organization's share of outside directors in 1970 and firm performance relative to its industry in 1980. However no significant relationship between the firms performance in 1970 and share of outside directors in 1980 (Baysinger and Butler, 1985). The complex and contradictory nature of these findings suggests that more research is needed to understand the nuances of the relationship between board interlocks and firm performance.

Criticisms of board interlocks research have focused on three issues. The first is that interlocks fail to predict corporate conduct (Mizruchi, 1996; Stinchcombe, 1990; Zajac, 1988). A second criticism is that interlocks do not capture the complexity and richness of inter-firm networks. Past research often includes board interlocks as the only measure of inter-firm networks, ignoring other types of networks such as strategic alliances. Finally, the impact of board interlocks on firm performance is inconsistent. A main idea for the assumption of improved performance is access to resources and information, otherwise not available (Lamb and Roundy, 2016).

## **2.2 STRATEGIC ALLIANCES**

Strategic alliances are an important mode to conduct economic activity. Starting from the 1980s, the number of strategic alliances has rapidly increased in a large number of industries (Hagedoorn and Schakenraad, 1990; Hergert and Morris, 1988). We are currently in a rapidly evolving technological environment, causing blurry industry boundaries, fast-changing markets and global integration. This has been caused by the temptation for firms to expand and grow, in a faster manner than possible, given their own resources. The increasing number of strategic alliances and their dismal failure record has fueled growing interest and concern among scholars on this topic (Gomes, Weber, Brown and Tarba, 2011). Most of the earlier studies tended to focus on the pre-agreement phase, including broad aspects such as motives for collaboration, joint ventures as strategic choices, partner selection and negotiations and contract (Doz, 1996; Glaister, 1998; Parkhe, 1993). More recent research has increasingly shifted attention to aspects related to the post-agreement phase, such as the effective management of alliances, cross cultural understanding and firm performance (Brouthers and Bamossy, 2006; Buckley,

Glaister, Klijn and Tan, 2009; Christoffersen, 2013; Luo, 2001; Reuer, Zollo and Singh, 2002). Strategic alliances are commonly defined as voluntarily initiated cooperative agreement between firms that involve exchange, sharing or co-development, and can include contributions by partners of capital, technology or firm-specific assets (Harrigan, 1986; Gulati, 1995a, 1995b).

### **2.3 ALLIANCE PARTICIPATION AND BOARD INTERLOCKS**

Strategic alliances in terms of formation crosses a wide range of theoretical perspectives (Kogut, 1988). Within the literature on the formation of alliances one can distinguish between studies that have examined factors that explain alliance formation rates and a second group of studies that have focus on the motivation, reasons and incentives for entering alliances (Gulati, 1998).

Research on the variables and factors which affect alliance formation rates exist on both industry and firm level (Gulati, 1998). Factors that affect alliance formation rate on a firm level are amongst others size of the firm (Burgers, Hill and Kim, 1993; Gomes-Casseres, 1997; Shan, 1990), age (Baum and Oliver, 1991; Stuart, Hoang and Hybels, 1999), competitive position (Eisenhardt and Schoonhoven, 1996; Stuart, 1998), resources (Barney, 1991), product diversity (Shan, 1990), and network embeddedness (Gulati, 1995b). On industry level, the degree of competition (Eisenhardt and Schoonhoven, 1996), environment uncertainty (Burgers, Hill and Kim, 1993; Dickson and Weaver, 1997) and the development stage of market and technology (Pisano, 1989) are factors that explains alliance formation rates.

Most research on strategic alliances has been at the level between two alliance partners (Gulati, 1998). However, a firm's social web of relations is the most important aspect of its environment (Powell and Smith-Doerr, 1994). Any economic or social action is not an atomistic action, but rather embedded in social networks of relationships (Gulati, 1998). Furthermore, many opportunities for alliances often stem from firms' existing ties (Gulati, 1995b), which also influence the design, evolutionary path and ultimate success of a new alliance (Gulati, 1995b). Thus, the classical dyadic relationship is not suitable to explain the antecedents and the outcomes of strategic alliances; rather, a network perspective is needed due to

the environment that firms actually exist in. In other words, a network view entails that the system of relations between actors defines their opportunities and constraints (Brass, Galaskiewicz, Greve and Tsai, 2004; Powell, 2003; Gulati, Nohria and Zaheer, 2000).

Embedded tie formation is the notion that the characteristics of a particular network influence the likelihood of organizations forming ties, as well as the likelihood that two specific actors within that network forms a relationship (Gulati, 1995b; Gulati and Gargulio, 1999). Other studies find that the network structure is a source of information, and since risk and uncertainty are fundamental to partner selection, the network is used in determining with whom to build a new tie (Williamson, 1975; Gulati, 1995b; Gulati and Gargiulo, 1999). Hence, organizations tend to select partners they are familiar with and whom they are likely to have rich information on. This could suggest that firms that have board interlocks have more information about each other, and thus are more likely to partner up. Gulati (1995) argued that it is the social context formed by the existing network of relationships that makes the partner aware of alliance opportunities. Social networks provide information about partners and create reputational circuits. Gulati and Westphal argue that for instance the social network of board interlocks can influence the propensity to form alliance (1999). A board consisting of a heterogeneous group, can provide more connections and thus greater opportunities for future alliances. The diversity in the board members, grants a diversity in and through their interlocks which can further increase knowledge and information sharing. Should strategic alliances be a part of a board discussion, naturally a board member with ties to a relevant partner has an important say in the matter. Consequentially, this might lead to a bigger propensity of participating in an alliance. In other words, this is a simple idea of a “bring your friend”-mechanism which may take place.

Hence, we propose the following hypothesis:

***Hypothesis 1: The larger number of interlocking members, the higher the likelihood of alliance participation.***

## 2.4 ALLIANCE PERFORMANCE AND BOARD INTERLOCKS

Strategy literature is expressed and evaluated in terms of success. Thus, *alliance performance* has naturally attracted research attention. Despite this, alliance performance remains one of the least understood aspects of alliances (Das and Teng, 2003). Whereas well-known successful alliances such as Apple/IBM or Google/Luxottica have showcased the potential of alliances, a large number of alliances suffer from unsatisfactory cooperation and poor performance. Hence, alliance failure grants vast devotion by scholars. One can regard 60% of alliances, in some ways, as failures (Das and Teng, 2000). Claims have also been made that alliances may in fact produce lower success rate than formal and single corporations (Bleeke and Ernst, 1991). Given these numbers, and the complex classification, practitioners and researchers have all been captivated to take a closer look at alliance performance.

### 2.4.1 Board interlocks and sources for strategic alliances performance

Pfeffer (1972) observed that organizations that had a better match between their board structures – or external links via directorate ties – and their firms' critical resource dependencies reaped superior returns. This suggests that it is beneficial for the senior executive team to have the types of external ties that will support the firm's strategic profile (Geletkanycz and Hambrick, 1997), such as board interlocks that could support strategic alliances. Coordination of decisions and internal management of the alliance between partners has been shown to have an important role in the performance of the alliances and of its members (Dyer, Kale and Singh, 2001). The coordination could possibly be improved by an interlocking directorate which strengthens the link between alliance partners.

Furthermore, partnerships decisions are affected by previous interfirm relationships between organizations, and the social context that emerges from such relationships provides firms with information regarding other partners (Gulati, 1995a). Consequently, information from past dealings has been regarded as the best information one can have, as it creates trust and reduces the incentives of misconduct (Granovetter, 1985). Past dealings could also include social relations through board interlocks, creating a better reciprocal information flow between the alliances partners.

Below, we elaborate and discuss the empirical and theoretical work in the literature on the elements which affect strategic alliances' success. The discussion includes areas which motivate us to pursue this study. These are key areas we believe, could be enhanced when introducing the element of an interlocking directorate. In the case of *knowledge* sharing and information flows, which is well-known for its essential role in alliance success, an interlocking member could provide significant experience and a play a key role in the process of alliance participation.

Furthermore, research views *opportunism* and *trust* as paramount in the making of a successful alliance, especially in the implementation phase. These are ambiguous and complicated concepts, which makes them hard to identify before they influence the relationship of the participating firms. However, an interlocking member could provide a solid foundation of trust through their position in both firms, providing the alliance with common ground. In addition to this, the ever-present risk of opportunistic behavior could be mitigated by the fact that an interlocking member sits in a position which requires them to have a shared interest and incentive to create a successful alliance.

### ***Knowledge-sharing and information flows***

In today's exceedingly competitive business environment, knowledge is generally contemplated as the critical resource for competitive advantage of firms (Quinn, 1992; Doz, 1996; Sveiby, 1997; Teece, 1998). With these changes, a firm's self-sufficiency in creating knowledge will generate risks and the possibility of failure (Chen, 2004). However, with the help of interfirm relationships, firms can considerably improve their ability to absorb knowledge to compete (Inkpen, 1998). A critical factor for a firm's success lies in the ability to create knowledge within their boundaries, as well as exposing themselves to a diversity of new knowledge from outside. This can prevent rigidity and encourage restructuring of their competencies (Leonard-Barton, 1995). This furthermore increases the need for knowledge transfers between the participating firms, in order to grasp the hard to transfer knowledge, also referred to as specific knowledge (Chesbrough and Teece, 1996). Strategic alliances are therefore a natural reaction to the complications faced when attempting to transfer specific knowledge (Jensen and Heckling, 1995). The

cost of the knowledge transfer can in some cases be principally high, when for example involving new product creation, new technological development or other highly innovative activities which often require extensive specialized knowledge (Chan et al., 1997).

A firm's competitive advantage therefore increasingly depends not only on its internal capabilities, but also on the external collaboration relationships with other firms (Parkhe, 1991). Strategic alliances consequently constitute one of the most adequate, but nevertheless complicated medium for co-opting other firms knowledge competencies (Simonin, 1999; Mowery, Oxley and Silverman, 1996). Acquisition of knowledge through other firms appears strategically important in order to survive in competitive business environments (Huber, 1991; Nonaka, 1994; Stinchcombe, 1990). This could suggest that one of the prominent sources of high performance in alliances is the gains in terms of knowledge transfer. If an alliance then is characterized by both a formal link (the alliance itself), and an informal social link (a board interlock), this could lead to stronger communication channels, better information flows and deeper involvement in alliance implementation. Consequently, ensuring enhanced and increased knowledge-sharing, which in turn, could and should improve alliance performance

### *Effects of trust*

One idiosyncratic element of strategic alliances is that the participating firms have uncertainty in their environment at the same time as the uncertainty arise from the partners behavior (Harrigan, 1985). This dependency between partnering firms, has led to research emphasizing the significance of relational factors for a seamless execution of strategic alliances (Powell, 1990). None have established more of a footing than trust (Gambetta, 1988; Mayer, Davis and Schoorman, 1995; McEviley et al., 2003; Sako, 1991; Zaheer, McEvily, and Perrone, 1998; Zand, 1972). Chiles and McMackin (1996: 85) defined trust as "the expectation that an exchange partner will not engage in opportunistic behavior, even in the face of countervailing short-term incentives...and uncertainty about long-term benefits." A firm would undertake a transaction with a partner if the firm trusts the partner (Afuah, 2013). Trust can be built into the transacting partners (Zaheer et al., 1998; Lado et al., 2008). According to Granovetter (1985) and Uzzi (1997), personal relationships

can generate trust and discourage opportunism. Thus, a consensus has been established concerning trust as a key factor in a successful alliance, determining that trust inhabits a positive effect on alliance performance (Dyer and Chu, 2003; Mohr and Spekman, 1994; Zaheer et al., 1998).

There is broad consent in earlier research supporting the advantageous effect of trust. Studies have empirically displayed how trust, by implementing reliability, good faith and fairness of behavior (Salo, 1991; Zaheer et al., 1998), reduces the possibility of conflicts, can encourage smooth information flow between partners (Sako, 1991; Zand, 1972) and allow for constructive interpretation of partner motives (Uzzi, 1997). Trust can therefore be seen as a tool in mitigating uncertainty concerning the partnering firms behavior (Krishnan, Martin and Nordeehaven, 2006). Thus, as proposed by Zaheer et al., (1998) and Lado et al., (2008), an interlocking board member, invested in the participating firms, can possess the necessary trust, creating a solid foundation of trust, which in turn can contribute to an improved alliance performance.

### ***Opportunistic behavior***

Board members were early on branded as the system within firms, which stockholders could use to monitor the opportunism of top executives (Fama and Jensen, 1983). Opportunistic behavior here refers to self-interest with guile, and “incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate or otherwise confuse” (Williamson, 1985: 47). It may also include deceitful behavior such as; avoiding and failing to carry out responsibilities, delivery of substandard products and stealing a partner firm’s technology/solutions/ideas (Zhang et al., 2006). In the world where neoclassical economic assumptions of rationality and complete information holds (Weintraub, 2007), there is no information asymmetry and alliance partners are rational. In such a world, it is difficult for an alliance partner to behave opportunistically during transactions (Williamson, 1985, 2002). However, in the real world, alliance partners are boundedly rational and unlikely to know, or able to obtain, all of the information they need for successful transactions. The result is information asymmetry, which creates an opening for opportunistic behavior.



Analysis of alliances, puts emphasis on the relationship between the firms, as the renowned “contract” (Jensen and Meckling, 1976), which will be subject to monitoring and risks by both parties. Entering an organizational cooperation, such as a strategic alliance, will naturally bring forth uncertainty of the goals, incentives and motives for all involved parties. In some cases, monitoring and full control can be tough, and even lead to a tense relationship and can in some cases raise difficult questions.

Scholars have therefore advocated trust building as an effective solution to the contractual risks that could arise (Bradach and Eccles, 1989; Zhang et al., 2006). This makes room for the natural belief that prolonged business relations between firms can be expected to generate an element of trust (Zhang et al., 2006). The close and frequent relations of strong relationships can enable alliance partners to learn more about each other, thereby decreasing information asymmetry. Close and frequent relationships can also lead to an increase in the level of trust (Uzzi, 1997). Both a reduction in information asymmetry and an increase in trust can decrease opportunistic behavior (Uzzi, 1997). This could suggest that alliance partners that have board interlocks have stronger relationship with an element of trust, due to amongst other factors, less information asymmetry. Another factor entails the incentives of executives and board members on each firm. The incentives of the firms naturally become more aligned when sharing a board member, which would work towards a common goal consequently benefitting the alliance as a whole.

#### *2.4.2 Interlocking alliances*

In the search for interlocking alliances, these empirical findings motivate us to investigate such alliances abnormal returns. The literature, and its search for the sources of effective and successful alliances provides a great number of strategic factors, which we think can be influenced by an interlocking member. It also elaborates on the possible pitfalls, failures and risks involved in interorganizational relationships. The areas discussed above, all focus specifically on how such elements are pivotal for the success of an alliance. An interlocking directorate, a person linking two (or more) firms in question, will advantage the mitigation of challenges and strengthen the opportunities derived from the literature.

The formation of an alliance, incorporating such a valuable asset as an interlocking directorate, with the tacit knowledge encompassing the organizations structure and cultures, should provide a sounder platform. This could enhance knowledge sharing, information flows and tacit knowledge transfers between the firms. Being part of both firms at the time of formation, could also create a rapid, more efficient channel for communication across all platforms. Furthermore, a board interlock could mitigate the following opportunistic behavior. Their common interests implemented in both partnering firms, strengthens the incentives to make sure all relevant parties are gaining their respective expectations. The interlocking members motives, will depend on the success of the alliance, for both firms. Trust, an ambiguous yet always present element in interorganizational relations could also be mitigated and enhanced through the presence of an interlocking member (Bradach and Eccles, 1989; Zhang et al., 2006). This may facilitate a strong feeling of trust between the partnering firms, channeled through the member. The board interlock reassures the firms involved through a pre-existing relationship between them, creating familiarity with the newness and uncertainty involved (Uzzi, 1997).

In this paper, we try to establish the effect of board interlocks, when they occur in an announced strategic alliance. Through our collected data, we intend to identify if interlocking alliances have taken place in the US, from 2010-2015.

Thus, we propose the following hypothesis

***Hypothesis 2: The participating firms of an interlocking alliance, will reap significant abnormal returns in the days surrounding the announcement.***

## **2.5 Measurement of alliance performance**

Research covers different measurements regarding alliance performance. This is subject to different opinions concerning the dependent variables affecting alliance performance. Some prefer individual measures as “perceived satisfaction” (Parkhe, 1993), while others use isolated measures like revenues and costs (Contractor and Lorange, 1988) or profitability and sales growth (Mohr and Spekman, 1994). Survival and death have also been used as measurements (Geringer and Hebert, 1989, 1991), assuming that dissolved alliances are less successful. Other researches

have used abnormal daily returns observed on the announcement day of newly formed strategic alliances (MacKinlay, 1997; Villalonga and McGahan, 2005; Oxley et al., 2009).

This naturally leads to the essence of the discussion, determining what an actual effective alliance means. There are two well researched streams, different by the way they view the alliance. Some research concentrates at the link, the actual alliance between the firms (Brockhoff and Teichert, 1995), while others suggest the partnering firms forming the alliance should be the focus of alliance performance (Oxley et al., 2009). Critique is also raised in the presence of this discussion, as partners may not have similar or even compatible objectives in the alliances, which will make it hard to identify mutually agreeable performance criteria (Das and Teng, 2003).

The differences of opinion concerning the classifications of alliances, certainly disrupts the views on the best performance indicators. The diverse dynamics in their definitions cause different impacts on the alliance performance. For instance, the management aspect varies vastly among the alliances (Gulati, 1995b) and they are also likely to evolve in different pathways across their lifespan (Doz, 1996). Unsurprisingly, this leads to no clear consensus on the definition of alliance performance (Yan and Zeng, 1999). However, as with the definition of alliances, there is a common denominator, which is connected to goal accomplishments (Beamish, 1988; Anderson, 1990; Beamish and Delios, 1997; Lin and Germain, 1998). The choice and justification of our measurement is discussed in the following methodology section.

### **3.0 METHODOLOGY**

The analysis consists of two parts. In the first part we examine the relationship between board of directors and strategic alliances. In the second part, we identify interlocking alliances by combining and exploring data on board interlocks and strategic alliances. The potential effect of board interlocks on alliance performance is then analyzed by conducting an event study, measuring if any abnormal returns to the alliance partners exists. In order to do both, we worked substantially with data sampling, cleaning and reshaping, which will thus be elaborated briefly below.

The analysis starts by trying to establish if there is a relationship between alliance participation and the board of directors. We wanted to observe the relationship between board members and their respective interlocks with other firms, on alliance participation. What we set out to do, was establishing if any of these elements would affect the likelihood of the firm participating in an alliance.

This is conducted through a logistic regression model, otherwise known as “logit”-models. In the search for interlocking alliances and the identification of their performance indicators we apply event study methodology. The analysis and methodological approach is described from data sampling to results. The first task at hand was to acquire the data available on alliances and directors, and create the databases needed for the applied analysis and methods.

The data sampling and analysis demanded three key steps; 1) Identifying and creating a dataset of board interlocks 2) Identifying the interlocking alliances. 3) Calculating and analyzing abnormal returns for the interlocking firms.

### **3.1 Data and Sampling**

#### *3.1.1 Alliances*

To compile our sample of alliances, we extracted a dataset from Securities Data Company (SDC) Platinum containing alliances from the U.S. We compiled information on all alliances created in the U.S and their announcements stretching from January 1<sup>st</sup> 2010, to December 31<sup>st</sup> 2015. This process yielded a total of 4.034 alliances. Each observation included all the participants, ranging from two to six partnering firms. Each alliance was identified through the announcement date, their participants CUSIP’s (6-digit), company tickers, and ultimate parent company. First revision of the data entailed cleaning to contain only U.S companies involved in the alliance. Some of the alliances slipped through the SDC filter as “U.S”, when their ultimate parent was registered on a foreign exchange market (e.g. SONY, Tokyo). This led to a revised initial dataset of 3.063 alliances.

### *3.1.2 Board Interlocks - Directors and Executives*

Our first step in creating the database of interlocking directorates was extracting a dataset of American firms in the same period, 2010-2015. This was done through LexisNexis, Corporate Affiliations systems. The data that was available to us, was a dataset containing firms, their board of directors, executives and a vast amount of other firm and individual specific variables. After cleaning the data, to only contain parent company, board members, executives and CUSIP's we were left with an initial dataset of 41.425 observations. Directors ranged from 5-19, and executives ranged from 11-49 per company. Some of the observations lacked CUSIPs which were needed as a common denominator to merge the data. We therefore removed the firms with no identifier, deleting 14.392 observations, leaving us with 27.033 observations.

## **3.2 Data Manipulation and analysis**

### *3.2.1 Identifying Board Interlocks - unique combinations*

A substantial amount of work was needed in order to reshape the data to display each individual combination of board interlocks. The initial extracted dataset was sorted by each firm and contained their respective directors and board members. Each firm held an observation from 2010-2015, which was contained for the rest of the analysis, as board members changed across years. Directors which also held an executive position were reduced to only one occurrence, to avoid "internal board interlocks". The data was reshaped to display, by individual, every firm the person was connected to. The last step was identifying and isolating each combination of firms that each individual was part of. Now the data contained each individual's different set of firms they were sitting on, making it possible to later explore if any combination of alliances matched. The result was an edge list displaying the individuals as such;

<i>Year</i>	<i>Individual</i>	<i>i</i>	<i>j</i>
2010	John Smith	A	B
2010	John Smith	A	B
2011	John Smith	A	C
2011	Chris Hale	E	F

### 3.2.2 Alliances - Unique combinations

The dataset extracted from the SDC was manipulated in the same matter. We created individual alliance IDs and separated the duplicated cells into singular cells containing the firms. Next step was reshaping to display each individual combination of two firms. This led to two initial databases which were comparable for the next part of the analysis.

## 3.3 Board size and interlocks effect on the likelihood of alliances

### 3.3.1 Dependent Variable

We set out to establish how the factors surrounding board members relate to the likelihood that a firm participates in an alliance. The dependent variable is therefore described as a firm being in an alliance in the defined time period or not, creating a binary dependent variable;

**in\_alliance<sub>i</sub>** = 1, if the firm is in an alliance, 0 if not.

ALLIANCE Y/N	Freq.	Percent	Cum.
0	11,646	81.70	81.70
1	2,609	18.30	100.00
Total	14,255	100.00	

Table 1: Descriptive statistics - alliances

### 3.3.2 Independent variables

#### *Number of Board Members*

To explore the effects of board size and interlocking activities on alliance participation, the size of the board is regarded as an essential measurement. The number of individual board members were calculated for each firm in each year, and is represented by the variable;

**board\_members<sub>i</sub>** = number of board members on firm *i*.

### *Board Members and firms network diversity*

An accepted view is how firms are diverse bundles of resources and capabilities (Barney, 1991; Penrose, 1959). Thus, a firm's network will grow more diverse as their connections and links to other firms increase (Burt, 1992). As discussed earlier however, firms do fall under the routine of entering into repeated partnerships with similar firms as indicated by Gulati (1995). It could therefore be substance in assuming that the pure diversity of a firm's network is not increased equally by the number of alliances, as it is increased by the extent to which their relationships are individual, separate or unique. In order to establish how the members of the boards individual relationships with external firms affect the probability of alliance participation we use a second independent variable;

**Links<sub>i</sub>**= Number of links for firm *i*.

This is calculated by each firm's individual board member, and all the firms they are connected to, through a board interlock. A firm with *five* board members, where each member also sits on *five* other firms, creates 25 links.

### *3.3.3 Control Variables*

A number of control variables, in terms of firm specifics are added to provide a stronger logistic regression model. Strategic alliance participation and formation are widely discussed in terms of industry, firm size R&D expenditure and sectors, which provide a sounder understanding and predict an improved estimation.

As discussed in the literature review, the quest for knowledge and resources accumulation is one of the most prevalent motives for alliance participation. Certain types of resources are particularly instrumental in alliance participation. Research regularly cites how R&D- intensive sectors point to how the prevalence of technology plays a key role in the alliance decisions (Dickson and Weaver, 1997; Dodgson, 1992; Hagedoorn, 1993). Furthermore, several studies identify how the sharing of knowledge is the dominant objective behind a strategic alliance (Dyer and Nobeoka, 2000; Inkpen and Crossan, 1995; Kale et al., 2000; Khanna et al., 1998; Larsson et al., 1998; Lyles, 1988; Mody, 1993; Mowery et al., 1996; Simmonin, 1997, 1999). The literature on strategic alliances also often focus on

how firms in the search for knowledge acquisition and innovation, are highly motivated, thus more exposed to strategic alliance formation and participation. That is why we included the independent control variable, which displays the increase in directed investments for firm  $i$ ;

**Investmnt <sub>$i$</sub>**  = firm  $i$ 's increase in investments (In million \$ USD)

Furthermore, as technology is widely entering all the different sectors of the market, we find it appropriate to add context by including categorical dummy variables differing between the 10 primary SIC-codes. Industries widely affected by horizontal alliances such as technology sectors, have for long been the central point of analysis in strategic alliance literature. However, with globalization and higher need for rapid innovation and growth affecting all sectors, alliances, partnerships and cooperation across sectors become visible and more apparent. Thus, we include SIC-code dummies.

**Sic1 -Sic10**; *Dummy Variables connecting the firm to its group of SIC's.*

	Total	Std. Err.	[95% Conf. Interval]	
sic1	58	7.600531	43.10197	72.89803
sic2	634	24.61392	585.7535	682.2465
sic3	199	14.00842	171.5417	226.4583
sic4	5372	57.86014	5258.587	5485.413
sic5	1163	32.68319	1098.937	1227.063
sic6	426	20.32974	386.1511	465.8489
sic7	912	29.21836	854.7282	969.2718
sic8	3210	49.87317	3112.242	3307.758
sic9	2244	43.48431	2158.765	2329.235
sic10	37	6.075076	25.09206	48.90794

Table 2: Descriptive statistics - SICs

To differentiate the firms in terms of their size, financially, we added another two control variables, to account for revenues and market value. Size of the firms are often used in research on alliances. The findings often vary, based on industry and moderations variables used to obtain their results. It has been found that smaller firms, which exercise an offensive approach to identifying and partnering create alliances which reap superior marked-based performance (Sarkar et al., 2001),



calculating firm size in terms of number of employees and yearly revenue. In their well-known study of strategic alliances, Eisenhardt and Schoonhoven (1996), apply firm size variable as total assets when researching alliance formation in different marked conditions. It has also been argued that start-ups thrive when their network allows the possibility of alliances (Baum et al., 2000). There is also a notion that larger firms holding resources and capabilities, will search for opportunities outside their core competency, while smaller firms focus on cooperation within their core competencies (Santoro and Chakrabarti, 2002). Firm size is therefore added as control variables, using the firm’s yearly revenue and market value, gathered from COMPUSTAT/CRSP.

**Revenue<sub>i</sub>** = *firm i’s revenue*

**Mkvalt<sub>i</sub>** = *firm i’s market value*

Variable	Obs	Mean	Std. Dev.	Min	Max
investmnt	13,526	882.4446	7698.08	0	260674
revenue	14,166	4287.132	17965.76	-1964.999	483521
mkvalt	13,322	6081.569	23077.89	.2066	528168.4

Table 3: Descriptive Statistic - control variables

	in_all~e	invest~t	revenue	mkvalt	board_~s	links
in_alliance	1.0000					
investmnt	0.1208	1.0000				
revenue	0.1952	0.3074	1.0000			
mkvalt	0.2459	0.4020	0.7158	1.0000		
board_memb~s	0.2333	0.2015	0.3344	0.3413	1.0000	
links	0.1862	0.0842	0.2683	0.2517	0.3816	1.0000

Table 4: Descriptive - correlation matrix

### 3.4 Event Study to identify and analyze interlocking alliances

#### 3.4.1 Identifying board interlocks within alliances

The last step was to develop the database that would identify alliances and their respective interlocks. In order to achieve this, we converted the variables to be eligible for merging. This step contained small changes; reducing the 9-digit CUSIP in the board data to a 6-digit CUSIP and converting the dates from the alliance-data to years. Finally, we merged the two datasets by years and firms to detect if there exists a situation where an alliance is announced, where the participating firms are

interconnected through a board member. The data would show a match if the combination of firm “i” and “j” in an alliance would match a combination of the same firms through a person sitting on them both.

For the purpose of our study, we isolated our search to only search for a direct interlock, meaning that person A needs to be sitting on firm 1 and 2 at the time of the alliance. This excludes the cases of interlinked firms through a third party, explained as firm A and C are connected because they both have a board member serving on B as well.

#### *3.4.2 Measurement of alliance performance*

Drawing from the strategy literature, there are three recognizable measurements that depend on the goals of an alliance; financial, operational performance and organizational effectiveness (Venkatraman and Ramanujan, 1986). Financial performance addresses the situation where the participants of the alliance agree on explicit financial goals. Operational performance focus on key success factors, that indirectly might lead to financial performance (Venkatraman and Ramanujan, 1986). The performance can hence be calculated by such key success factors. However, it is important to note that financial performance is not always a part of the goals of an alliance (Anderson, 1990). The key success factors will in this case, still be of importance, as the operational success factors might be a measurement of effectiveness. Organizational effectiveness insinuates the contentment of the organization’s goals, taking into account the interests of relevant actors. This is also widely discussed as its difficult to measure (Gawande and Wheeler, 1999).

The theoretical and empirical findings of the most commonly cited event studies about alliances mostly find a positive abnormal return for partner firms following an announcement of an alliance (Das et al. 1998; Anand and Khanna, 2000). Two noteworthy contradicting results are the research by Reuer and Koza (2000) and Villalonga and McGahan (2005). The former discusses how the reaction is restricted to the subset of their alliances that may take place under substantial asymmetrical information. Basically, that the investors view the alliance as an encouraging way to reduce the aforementioned asymmetry. The latter discovers no significant effect when analyzing market returns in a detailed sample of alliances

by 86 firms of the Fortune 100 in the timeline of 1990 to 2000. Oxley et al (2009), in their research of these effects on rival firms also suggest that these interpretations may be premature, absent investigation of the effect of alliance announcements on the stock market reactions of the alliance's competitors. The most interesting consensus of the studies that discovers positive returns relate this effect with enriched value creation within the alliance. Some of the studies actually unequivocally draw the deduction that alliances are effective drivers for learning, resource accumulation, or both (Kale et al. 2002, Koh and Venkatraman 1991).

### 3.4.3 Abnormal Return Methodology Steps

In accordance with previous research on alliances applying event study methodology, we started by defining the dependent variable. This is done through estimating the stock market's valuation of the partnering firms change in value accruing on the announcement of the alliance. The procedure we have implemented contains *four* intricate steps for each firm involved in the interlocking alliance.

*Step 1:* Estimation of the marked model for each firm's stock returns during an estimation period prior to the event date (day of alliance announcement)  $t=0$ . Following prior research (MacKinlay 1997, Villalonga and McGahan, 2005; Oxley et. al, 2009), we implement an estimation period that stretches over 150 days. This period has a starting point at day  $t= -170$  to day  $t= -21$ . We use this to estimate the following equation for each firm's stock:

$$r_{it} = \alpha_i + \beta_i r_{m_t} + \varepsilon_{it} ,$$

$r_{it}$  denotes the daily return for firm  $i$  on day  $t$ .  $\alpha_i$  and  $\beta_i$  are the firm-specific parameters and  $\varepsilon_{it}$  is independent and identically distributed.  $r_{m_t}$  represents the corresponding daily return for the value-weighted S&P 500.

These estimations provided us with the estimated coefficients ( $\alpha_i$  and  $\beta_i$ ). Which lead us to

*Step 2:* We used these estimated coefficients in order to predict the expected daily returns for each firm ( $i$ ) over our defined event windows:

$$R_{it} = \alpha_i + \beta_i r_{mt},$$

In this case,  $R_{it}$  denotes the expected daily return for firm  $i$  on day  $t$ . This formula is used in order to identify the expected return for the firm's return on any given day, based on our estimation period of returns. By identifying how the market predicts this return and seeing it in light of the actual returns accruing on the day, we can calculate the possible abnormal returns.

In our study we have chosen to look at *three* different event windows; 2-day window  $[-1, 0]$ , 3-day window  $[-1, +1]$ , and a 7-day window  $[-3, +3]$ . This is in order to be able to observe the effect of the alliance announcement, and the possible interlocks effect before and after the actual announcement. The effect of “unexpected good news”, might take effect the day before, on the day, or need a couple of days to fully be visible.

The last steps are calculating the abnormal returns and cumulative abnormal returns for the firms.

*Step 3:* is to calculate the ARs for each firm  $i$ . This was calculated for each day of the different event windows, by calculating the difference between the actual return accruing on the day  $r_{it}$  and the predicted return  $R_{it}$ .

*Step 4:* was to compute the CARs for each firm. This was done by adding the ARs throughout the different event windows.

#### 4.0 RESULTS

The descriptive tables display our variables and summary of our data. The revised database of 14.255 individual firms, and 3.063 alliances presents a merged result of 2.609 alliances. In other words, out of the 3.063 original alliances from the SDC, 2.609 were possible to identify when merging the data with our dataset from LexisNexis. This provided us with a statistical foundation of 18,3% of the firms being in an alliance during the estimation period.

### 4.1 Alliance Participation - Hypothesis 1

In the correlation matrix, we already observe the size and investment control variables correlate positively. Market size and revenue, strongly correlates with the increasesments in investments, further strengthening the notion of firms with funds, substantial cashflow and size naturally invests more, as expected. The SIC-codes presents the distribution of the number of firms within their primary SICs. Sic4, which represents the group “Manufacturing” (NAICS.com), holds a significant greater number of firms, compared to the rest. Seen in terms of the total number of business establishments in the U.S (As of June 14<sup>th</sup>, 2018, NAICS) “Manufacturing” actually only represents the 8<sup>th</sup> place out of the 10 primary SIC codes. However, we do not believe it would affect the estimations, as manufacturing firms are an attractive market place for vertical alliances, which also is demonstrated in our data.

Logistic regression		Number of obs	=	12,595		
		LR chi2(15)	=	1327.42		
		Prob > chi2	=	0.0000		
Log likelihood = -5259.668		Pseudo R2	=	0.1120		
in_alliance	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
investmnt	7.23e-06	5.96e-06	1.21	0.225	-4.46e-06	.0000189
revenue	6.46e-06	2.93e-06	2.20	0.027	7.17e-07	.0000122
mkvalt	.0000228	2.40e-06	9.48	0.000	.0000181	.0000275
sic	.0004379	.0000585	7.49	0.000	.0003233	.0005525
sic1	4.658046	.8430058	5.53	0.000	3.005785	6.310307
sic2	4.338205	.7082995	6.12	0.000	2.949963	5.726446
sic3	3.032089	.732484	4.14	0.000	1.596447	4.467732
sic4	2.783724	.6208487	4.48	0.000	1.566883	4.000565
sic5	2.420018	.5749258	4.21	0.000	1.293184	3.546852
sic6	1.638429	.5839043	2.81	0.005	.4939976	2.78286
sic7	.7464465	.5574372	1.34	0.181	-.3461104	1.839003
sic8	1.353997	.5327348	2.54	0.011	.3098564	2.398138
sic9	1.567594	.5020989	3.12	0.002	.5834978	2.551689
board_members	.030788	.0025545	12.05	0.000	.0257814	.0357947
links	.0367616	.0046428	7.92	0.000	.0276618	.0458613
_cons	-6.983484	.7621027	-9.16	0.000	-8.477178	-5.48979

Table 5: Logistic Regression - Hypothesis 1

Table 4 represents the logistic regression model (logit). The independent variables of interest, *board\_members* and *links* are both significant at the 99% level and provide some interesting results. The size of firm *i*'s board will increase the

probability of participating in an alliance. The logit reveals how increasing the board by *one* person, will increase the likelihood of participating in an alliance by 3,07 %. Furthermore, *links* closely resembles the same effect as the size of the board. For each link firm *i* possess through its board members, this will increase the likelihood of participating in an alliance by 3,67 %.

#### 4.2 Interlocking Alliances - Hypothesis 2

With 3.063 alliances and 14.255 firms, the result was surprisingly; *five* alliances which contained a board interlock.

ID	Firm	Revenue	Mkvalt	Investmnt	Board_members	Links	SIC
1	A	1.278M	1.513M	2.3M	17	4	1311
1	B	5.075M	18.289M	3.835M	19	2	4923
2	C	7.484M	20.378M	0M	56	25	6282
2	D	1.267M	5.716M	1.053M	28	1	6798
2	E	9973M	12.566M	20.382M	24	16	5000
3	F	469M	702M	0M	18	13	7370
3	G	1.089M	2.221M	85M	32	11	5612
4	H	14.427M	17.299M	1.922M	18	2	4911
4	I	5.903M	24.357M	1.062M	18	4	4923
4	J	20.951M	12.981M	17M	22	26	1311
5	K	10.737M	21.100M	0M	51	18	1311
5	L	146.156M	254.149M	4.267M	53	19	9997

Table 6: The interlocking alliances

#### 4.2.1 Abnormal returns

Alliance 1	-3	-2	-1	0	1	2	3
Firm A	0.69%	0.08%	-1.57%	<b>-1.08%</b>	0.52%	-0.51%	0.98%
Firm B	-0.07%	0.57%	-1.19%	<b>0.28%</b>	-0.24%	-0.43%	0.45%
Alliance 2	-3	-2	-1	0	1	2	3
Firm C	0%	-1.99%	-0.16%	<b>-0.16%</b>	-0.12%	2.95%	-0.69%
Firm D	-1.89%	0.82%	-1.11%	<b>-1.71%</b>	-0.06%	0.07%	0.72%
Firm E	1.08%	-0.12%	-1.95%	<b>-1.57%</b>	-1.38%	-1.17%	-2.46%
Alliance 3	-3	-2	-1	0	1	2	3
Firm F	0.35%	0.15%	-1.34%	<b>0.48%</b>	0.17%	0.78%	1.12%
Firm G	-1.33%	-1.83%	-0.37%	<b>-1.07%</b>	3.83%	0.66%	-0.60%
Alliance 4	-3	-2	-1	0	1	2	3
Firm H	-0.47%	-0.28%	-0.25%	<b>2.09%</b>	0.69%	-0.14%	0.12%
Firm I	0.71%	0.15%	0.18%	<b>1.28%</b>	-0.86%	0.35%	0.24%
Firm J	0.47%	-2.31%	-0.69%	<b>0.52%</b>	1.19%	0.33%	-0.85%
Alliance 5	-3	-2	-1	0	1	2	3
Firm K	0.95%	-1.14%	4.77%	<b>-0.81%</b>	0.13%	2.54%	0.04%
Firm L	0.25%	-0.09%	-0.64%	<b>0.19%</b>	-0.26%	-0.55%	0.05%

Table 7: Abnormal returns for firms

Isolating each alliance, and its participating firm's abnormal returns, the results vary. In our sample, most of the abnormal returns are negative surrounding the individual event windows. However, on the event date (announcement of alliance), the abnormal returns are positive in half the firms (6/12). Deeper analysis of the data, shows how the means for each window show negative abnormal returns for participating partners. This contradicts former research (e.g., Koh and Venkatraman 1991; Madhavan and Prescott 1995; Anand and Khanna, 2000), which find that alliance participants experience positive and significant abnormal returns in the window surrounding the alliance announcement.

Consequently, this affects the cumulative abnormal returns for the event windows. Most of the cumulative abnormal returns express negative returns. What stands out are firm *H* and *I* in alliance 4, and firm *K* in alliance 5, which shows positive CARs through all the event windows. This illustrates how only 25% of the companies involved in the interlocking alliances sustain positive CARs over the three event-windows.

ALLIANCE ID	FIRM ID	CAR2	CAR3	CAR7
1	A	-2.65%	-2.13%	-0.89%
1	B	-0.91%	-1.15%	-0.64%
2	C	-0.32%	-0.44%	-0.16%
2	D	-2.82%	-2.88%	-3.29%
2	E	-3.52%	-4.90%	-7.56%
3	F	-0.87%	-0.69%	1.71%
3	G	-1.44%	2.39%	-0.71%
4	H	1.83%	2.53%	1.76%
4	I	1.47%	0.60%	2.05%
4	J	-0.17%	1.02%	-2.00%
5	K	3.95%	4.09%	6.48%
5	L	-0.45%	-0.71%	-1.15%

*Table 8: Cumulative Abnormal Returns*

#### *4.2.2 Hypothesis and significance of ARs and CARs*

The unexpected and surprising low number of interlocking alliances implicated the possibility and sense of testing the results for significance. The sheer size of the sample (five interlocking alliances and 12 firms), in addition to the number of negative CARs eliminates the reasoning behind a statistical testing of these results. The reasons behind the small sample size are tough to explain, but several reasons grounded in theory are elaborated in the following discussion. However, the result of five individual alliances, out of 14,255 firms and 2,609 identified alliances, contributes to the literature through the fact that this is a rare occurrence (based on the US, from 2010-2016).



## 5.0 DISCUSSION

In this study, we firstly establish that there does exist some relationship between the firm's board and its likelihood of participating in an alliance. The size of the board and the boards links to other firms do increase the probability of participating in an alliance. Further, we identify some occurrences of what we chose to call an "interlocking alliance". Firstly, by the fact that there only existed *five* such instances in the US, between 2010-2016, we establish that interlocking alliances are rare occurrences. Secondly, they did not yield any significant cumulative abnormal returns, which makes us unable to conclude if an existing board interlock have any specific impact on alliance performance. As our findings and statistical results contradicted our hypothesis, the opportunity arises to further explore potential explanations and alternative ways to further strengthen the understanding of the relationship between board interlocks and alliance performance.

Gulati's (1999) study, highlights the importance of "network resources". More specifically, its highlighted how such resources do not reside within the firm, but through the networks of which they are embedded (Gulati, 1999). These capabilities are developed over time, through each firm's specific knowledge accumulated from historical experiences with interfirm relations. These resources are further proven to be influential in a firm's decision to form an alliance. In accordance with this, we find that the existence of a board interlock does appear to affect the probability of firms engaging in strategic alliances. We also find an effect when looking at the number of links each board possess. Naturally, this could be caused by a large number of factors.

What we believe is most essential for further research, which our study does not take into account, is the actual relationship between board members and their respective links. Some are qualitative measures, which could yield more insight into each member, and the collective outlooks towards strategic alliances. Gulati and Westphal (1999), studied how the social construct of a board interlock affect alliance formation. Their findings suggest that the relationship between CEO and board members, will influence the probability of alliance formation. Thus,

suggesting that board interlocks can both increase and decrease the probability based on their respective relationships within the firms.

While Gulati and Westphal (1999), look at the specific firms which shared a board interlocks chance of establishing an alliance, we extend this view. We wanted to study if the existence of board members with interlocks in general would increase firms' probability of participating in an alliance. We contribute to the literature by building on the notion that a firm's interfirm relationship, including their history and experience are influential on the probability for a firm to form alliances.

The regression results suggests that the higher number of links to external firms positively affect the firm's likelihood of participating in an alliance. The industry, firm and market specific knowledge, which an interlocking member may possess, seemingly should provide a firm with the right connections and a platform for exploring alliances. Again, the reasons behind the effect, is ambiguous and should further be researched to strengthen the empirical understanding of the phenomena. Some literature focuses specifically on the qualitative elements of the relationships, the role of the interlocking member (Gulati, 1995a; 1999) and the positioning of the alliance in the market (Stuart, 1998). Considering the results, where the probability of alliance participation increase by 3% per link that a firm possesses, provides interesting areas for further research.

Numerous theoretical and empirical interpretations of alliance formations have worked under the resource-based consideration which promote the formation of alliances (Gulati, 1999; Berg et al., 1982; Mariti and Smiley, 1983; Hagedoorn, 1993). Material resources and capabilities as the facilitators for alliances, highlights the importance of resource acquisition (Dierickx and Cool, 1989; Barney, 1991; Mahoney and Pandian, 1992). These types of research areas, typically focused on explaining performance through the differences across firms, the role of resource heterogeneity in explaining strategical changes, became prevalent. This further suggests how alliances are formed to strengthen the firms in the areas in which they lack resources, capabilities or networks.

However, partnerships with similar firms, but with different capabilities are very common and more successful (Gulati, 1995b; Nohria and Garcia-Pont, 1991). Firms logically acknowledge the potential in collaborating with firms possessing unique capabilities. Complementarity as a driver for alliance formation, have been observed in a number of different industry settings (Chung et al., 2000; Nohria and Garcia-Pont, 1991). Furthermore, the well-established opinion that similarity produces relations - coined homophily (Lazarsfeld and Merton, 1954) - suggests that firm seek out partners that are comparable along various dimensions. Partnering with similar actors, paves the way for easier trust, likeability and understanding which in turn could lead to reduced search and transaction costs for inter-firm cooperation (Kim and Higgins, 2007) - which we hypothesized would be strengthened through an interlocking board member.

Gulati further confirmed such features through the findings that firms sharing common third-party ties had a higher rate of forming alliances (1995). Stuart (1998) also contributes to this area of research through his findings that firms which were embedded in “crowded” technological niches, hence a larger number of potential partners with similar knowledge, granted higher propensity to cooperate. Thus, partnerships which are most common are when firms possess some dissimilarities on some dimensions (e.g. resources or capabilities), yet similar in other areas provides the social bonding which could ease implementation and transition in difficult times (Kim and Higgins, 2007). Given a certain degree of differentiation between the firms, a certain degree of a similarity dimension upon which the partnering firms can locate and share a common ground, *i.e. a board member in both camps*.

Embeddedness in already existing networks is seen as an asset which would allow firms to gain valuable information regarding capabilities, reliability and trustworthiness of potential alliance targets (Mirzruchi and Galaskiewicz, 1993; Gulati et al., 2002). In other words, a firm's participation in an established alliance network have been found to be a direct source of embeddedness that also have received researchers attention (Gulati, 1995b; Gulati and Gargiulo, 1999). Furthermore, this opens the discussion on the notion that repeated alliance ties

between firms, could reduce risk of opportunism, create trust and establish practices that could create energy and opportunities for future alliances.

What all of this have in common, are the empirical and theoretical foundations laid out by prior research, where the consensus is how previous alliance experience, and the opportunity of having a common social link, could increase alliance formation and enhance its future performance. This is further strengthened by our findings, enlightening the effect of a board's links and its positive effect on the likelihood of alliance participation.

One influence on the small sample of interlocking alliances, that we believe has grown in importance with the growth in vertical alliances, and the ever-expanding technological wave, is the political aspects which restricts board members positions. Mainly, the restrictions put in place to ensure fair competition. A majority of alliances in high-tech sectors such as biotechnology are vertical (Stuart et al., 2007). The reasoning could be defined by the efforts of two organizations to unite in order to combine distinct sets of activities along the value chain. In the technology sector, firms often follow a pattern of undertaking R&D, transferring the output to a receiver, which markets the product before having it fully developed and then sold or leased (Pisano, 1989; Reuer et al., 2002; George et al., 2002; Robinson and Stuart, 2007). While firms often partake in development of scientific breakthroughs through development, they seek partners which complement their assets through specialization in commercialization. Thus, the relationships between these firms are encouraged by the vertical division along the value chain. All of these links, opens up for vertical alliances to ensure internal growth with lower costs, faster time-to-market and all in all increased competitiveness. This may lead to an increase in alliances, embodied in the same industry.

The political elements behind the fear of collusion and information restrictions date back all the way to the beginning of the 19<sup>th</sup> century. Before the Clayton Act of 1914, anyone could interlock, creating collaboration links between firms. One example is how The National Bank of Commerce shared directors with almost every other significant bank of New York (Mizruchi, 1996). The Clayton Act of 1914's section 8 prohibited interlocks between firms deemed to be competition in

the same markets, which were found to cause a sharp drop in the number of interlocks among leading US firms (Mizruchi, 1982).

These examples, only incorporate the actual board interlock, which is one level of connecting firms. An interlocking alliance however, would take this to a deeper level of cooperation, further strengthening the already existing link. We believe these elements have affected the motives for interlocking alliances, in fear of collusion claims. Not only, do the firms in question share a common director or board member, but also incorporates a higher level of cooperation by forming an alliance. We believe these restrictions and continuous alliance formations in the sectors establish a significant influence on the number of interlocking alliances we identified.

Alliances, despite its rich research culture, displays an ambiguous phenomenon with complex measurements and difficulty in determining its success. They typically involve a process of transferring specific knowledge, special capabilities and information to achieve competitive advantage. The process itself is fraught with ambiguity (Jensen and Meckling, 1991). The actual contingencies, discussions and challenges that accrues to management is hard to observe, and therefore might not be reflected through abnormal returns. The interlocking member might bring security, experience and a more fluent implementation process and other well-established competitive enhancing elements. This however, might take weeks, months or years to accomplish, and could therefore not be accounted for at the announcement day of the alliance, thus not rewarding the participating firms with abnormal returns.

In other words, the potential competitive advantages, ease of implementation and integration, specific knowledge or other benefits that might accrue with the interlocking alliance, will not always be visible straight away. Furthermore, the actual goals of the alliance does not need to be reflected through abnormal stock returns. As discussed in the literature review, the different perspectives, theories and measurements of alliance performance often sites how “success” of an alliance take many forms. It is also important to take into account, how partners of an alliance might not share the same compatible objectives (Das and Teng, 2003).

Furthermore, what the participating firms see as a successful alliance can be very different. Thus, the effects of the board interlocks we set out to identify as enhancing the alliances, might not show through an event study.

This is our most significant acknowledgement. Even though the sample of interlocking alliances was small and the returns varying, we believe the actual occurrence of an interlocking alliance is an interesting event which should be studied further. A further discussion on limitations and future research will be elaborated in the next part.

## **5.2 Limitations**

The final results of the study and our analysis were interesting as well as contradicting and therefore raise some questions for future research. However, implications and challenges still arose and will be acknowledged and discussed below. We consider our main challenge and following implications to be in regard to the data sampling and revising of our board interlocks dataset. We set out on this assignment with the expectation of full access to a database containing; specific board interlocks, their number of interlocks and firms they were connected to. Restricted access created our first and most significant challenge; creating a database of board interlocks. Although time-consuming and disruptive of our timeline, we believe this specific bump in the road, granted us a great learning experience in statistical tools and data revision. It also provides us with a deeper understanding and “ownership” to our assignment, granting us the opportunity to create such a database.

Secondly, the SDC database also contains some imperfections. Even though SDC tracks back to 1989, the coverage of alliance data is incomplete, mainly because firms in the U.S are not required to report all alliance activity. Another limitation with SDC is inconsistency with firm identifiers. The database varies dramatically from year to year, where it changes between using CUSIPS and company tickers. Tickers, which we initially set out to use as our common merging variable, was missing for about two thirds of the SDC data. Nevertheless, SDC currently represents one of the most comprehensive sources of information on alliances (Anand and Khanna 2000, Villalonga and McGahan 2005, Oxley and Sampson, 2004), which was available to us.

This, in addition to the missing CUSIPS and tickers in LexisNexis created our most significant restriction in our study; the *timeline* which we wanted to research. Initially we had access to LexisNexis back to 2000. However, with the firm identifier limitations, we could only use the data from 2010-2015, as they were the only years containing CUSIPS (or any other method to combine the data). We believe a longer historical perspective, might have yielded a greater sample of interlocking alliances. We also consider our results of the abnormal returns to be somewhat of a limitation. We set out to explore the area where interlocks and alliances overlap, to see if such instances exist and how they perform. However, with the small sample of occurrences, we were not able to further analyze the returns nor conduct any significant statistical tests.

### **5.3 Future research**

Finally, we underline and discuss our methodological approach and suggest how alternative perspectives and research could make use of our findings for further research.

First of all, our methodological approach entailed using a general dataset, in order to maximize the potential of locating interlocking alliances. This naturally differs from studies which focus on specific firms, sectors and industry-factors that can add a narrower scope on conclusions. The findings still observe only a handful of examples where the phenomena take place. This should also be considered, as most of the occurrences demonstrates negative abnormal returns and does not give a complete picture of the situation. Our findings, does not in any way suggest that all interlocking alliances will experience negative CARs. Consequently, following an event study methodology, we focus on alliance performance in terms of financial goals, which as discussed in the beginning, is not the only explanation on how to measure if an alliance is successful. These elements bound together, leads us to our main suggestion for further research methods for further exploring interlocking alliances, which we believe could grant interesting results; case studies.

We find interlocking alliance even more interesting, after discovering how rare the occurrence is. With the varying results in their CARs, we believe there are many

elements which might not be captured by market reactions. We built our hypotheses on theoretical foundations such as trust, knowledge, agency and network effects which in many cases will enhance a firm's abilities in other ways than through abnormal returns. To further investigate what actually happens in an interlocking alliance, a qualitative case study of a previous interlocking alliance could provide powerful insight. In this way, one can focus on the specific link, the interlocking member, and investigate their role throughout the process and perform in-depth interviews. This could provide insight in how the interlocking member was involved, before, during and after the alliance implementation process. Research which follows an interlocking alliance from initiation to "completion" would also be of interest. Through such a study, the actual motives and goals for the alliance can be taken into account when measuring the success. Goals such as operational effectiveness, organizational structure enhancements or goodwill/reputational factors does not necessarily need to be observed by abnormal returns and could be enhanced or altered through an interlocking board member.

One other area of interest would be to see how these alliances affect rival firms, in accordance with studies such as Oxley et. al (2009). By dividing the search for the alliances into SIC-codes and identifying rival firms, one can use event methodology to see how abnormal returns accrue to the partners, as well as seeing the effect of the rival firms. This can be done through comparing the CARs, versus the CARs of the rivals, as a percentage of a firm's market value. The interesting element to this methodology, is the industrial economics view of how market shares are divided after such announcements. Should a firm accrue large abnormal returns after such an announcement, and therefore gained market shares, a rival firm should in theory, lose some of theirs. The theoretical elements which might be strengthened by a board interlock, would be interesting in terms of what happens to rivaling firms in each of the sectors involved. Oxley et al., (2009) actually drew the conclusions that a significant portion of their dataset, showed that the positive abnormal returns which accrued to partnering firms *correlates* with the positive CARs accrued to rival firms. An interesting result, which would be exciting to see in effect of the presence of a board interlock.



## 6.0 CONCLUSION

The literature on strategic alliances stretches across the specter of strategic management research; from formation to motives, goals and performance of the partnering firms. The literature agrees on certain elements, yet yield very varying results on many aspects, especially the measurements of performance in line with what each firm view as success. Board interlocks also encompass an interesting part of the research. The interlocking members own goals in addition to their effect on the firms they participate in, are studied actively. Thus, we set out to combine the phenomena in an attempt to contribute to the understanding of interorganizational relationships and their subsequent performances. Our goal was to investigate an interlocks effect on alliance performance, introducing board interlocks as a measurement to literature on alliance performances. We applied regression models to extend earlier research on the relationship between board members and alliance formation. Further, we applied event methodology to investigate the abnormal returns of partnering firms to extend earlier research by investigating the phenomenon of an interlocking alliance.

Our results firstly corresponded with prior research on the relations of board members and the probability of alliance formation. The effects of board size and external linkages are significant. The results suggest around a 3% increase in the likelihood for alliance participation, both per board member and link added.

The findings from our event study, contradicts conclusions from some of the studies on CARs, in that we find mixed results on the abnormal returns of the participating firms. Research applying event studies on abnormal returns on announcement displays differentiated results, but the majority identifies positive and significant CARs in the days surrounding the announcements. To our surprise, our findings also suggests that the occurrence of an interlocking alliance is quite rare (in the US from 2010-2015). However, we believe that this finding in particular could spark further research in the area, which focuses detailed on the specific occurrence, or future occurrences. We thoroughly believe a deeper look into an interlocking alliance, qualitatively for example, could reap interesting research on the development and implementation of such an alliance.

The findings bring fourth the need for further investigation into alliance performance, in combination with an interlocking member. This opens up for different methodologies and theoretical foundations, which in turn can provide new results and interesting points of view to the field. Qualitative case studies of the occurrences, event studies of other countries and a longer timeline are some of the areas we believe would provide improved insight and understanding of the phenomenon. Furthermore, we suggest a deeper look into the actual interlocking alliance to thoroughly investigate the role of the interlocking member, in order to build a detailed understanding of the different interlocking alliances and the role of the interlocking member.

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**APPENDIX A: PRELIMINARY THESIS REPORT**

BI Norwegian Business School - campus Oslo

- Preliminary Thesis Report -

GRA 19502 - Master Thesis

Component of continuous assessment: Forprosjekt, Thesis

MSc

Preliminary Master Thesis - Tarek Ziad Abdul-Hadi & Kim

André Ophus

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## **1.0 Abstract**

This preliminary thesis presents the plan for conducting a master thesis research project. It starts by explaining an identified research gap, as well as setting the background and context for the research. This will be followed by a theoretical review which presents an overview and the development of the research area. This will involve a breakdown of the ocean of research on alliances, alliance performance and board interlocks. In the end follows a description of how we plan to structure the work, how we will collect, prepare, transform, and analyze our data in the methodology section. A short description of our research design will also be presented, providing purpose to the research question and focus area.

## **2.0 Introduction**

Strategic alliances have long been a preferred choice by companies in order to expand and grow their business. The business world today is shaped by fast changing technological environment, blurring industry boundaries, fast changing industries and increasing global integration.

An alliance formed to solve a major strategic challenge is often defined as a strategic alliance (Yoshino and Rangan, 1995). Given that the strategy literature is expressed and evaluated in terms of success, alliance performance has naturally attracted a ton of research attention. Despite this, alliance performance remains one of the least understood aspects of alliances (Das and Teng, 2003).

Strategic alliances are commonly defined as voluntarily initiated cooperative agreement between firms that involve exchange, sharing or co-development, and can include contributions by partners of capital, technology or firm-specific assets (Harrigan, 1985; Gulati, 1995a, 1995b). Whereas well-known successful alliances such as Apple/IBM or Google/Luxottica have showcased the potential of alliances, a large number of alliances suffer from unsatisfactory cooperation and poor performance in the market. Hence, alliance failure has also received extensive attention by academics. One well-known claim is that 60% of alliances can in some way be seen as failures (Das & Teng, 2000b). Claims have also been made that alliances may in fact produce lower success rate than formal and single corporations (Bleeke & Ernst, 1991; Kent, 1991). Given these numbers, and the complex

classification, practitioners and researchers have all been captivated to take a closer look at alliance performance.

Researchers are far from seeing eye to eye on the measurements to use. This again is subject to different opinions concerning the dependent variables affecting firm alliance performance. Some prefer individual measures as “perceived satisfaction” (Parkhe, 1993), while others use isolated measures like revenues and costs (Contractor & Lorange, 1988) or profitability and sales growth (Mohr & Spekman, 1994). Survival and death have also been used as measurements (Geringer & Herbert, 1989, 1991), assuming that dissolved alliances are less successful. Other researches have used abnormal daily returns observed on the announcement day of newly formed strategic alliances (Oxley et al., 2009).

Research using board interlocks has thrived with the burst of research on interorganizational relations. A dominant question of the interlocks research has been and continues to be what do interlocks do? (Mizruchi, 1996). Board interlock studies can generally be categorized as concentrating on either the antecedents or the outcomes of interlock activities (Lamb & Roundy, 2016). The most popular research focus has been studies on the outcomes of board interlocks (Lamb & Roundy, 2016). Among these studies, the central aspect has been the potential impact of board interlocks on the performance of interlocking firms. The main notion is that board interlocks can provide organizations with certain resources and information to improve their performance (Davis & Cobb, 2010; Pfeffer, 1983). Board interlocks can also help facilitate a firm’s alliance formation (Gulati & Westphal, 1999), which can provide resources that improve firm performance.

Earlier research on board interlocks has received critique for using interlocks as the one and only measure of inter-firm networks. Thus, disregarding other forms of networks such as strategic alliances. This study intends to help fill this research gap by drawing a link between strategic alliances and board interlocks. Another critique against interlocks studies is that the impact of interlock activities on firm performance is inconsistent. By drawing the above mentioned link, this paper analyzes performance on an alliance level, instead of the most common which is

simply firm level performance in interlocks research. This may lead to valuable insights to the inconsistency in drivers of both alliance and firm performance, by widening the scope.

### **3.0 Research Statement**

In our thesis we will try to identify and analyze the connection between an interlocking directorate and its effect on the realized performance of the alliance. Can differences in alliance performance be explained by varying levels of board interlocks? Will an alliance between two firms profit from an interlocking directorate? Does the effect of being part of two separate companies board, provide the information asymmetry needed to increase performance? Does this governance structure and its changes affect performance, and if so, why and how? These are questions that motivated and steered the thesis and preliminary search for literature on strategic alliances and board interlocks. Through our research we wish to contribute to the strategic literature by answering some of these questions.

### **3.1 Research Question**

The foundation of any thesis is the research question we attempt to answer. This question is basically the core that drives our research process and provides a direction. It will also work as a statement of the problem we will analyze. Based on our preliminary review of both literature and possible questions, we have formulated the following research question:

*What is the effect of an interlocking directorate between two firms in a strategic alliance on alliance performance?*

### **3.2 Research Method**

In this research paper we aim to identify and discuss the potential effect of interlocking directorates in strategic alliances in the United States. Empirically, our goal is to statistically try to isolate and identify the effect of board interlocks on relevant alliances. We want to do this through analyzing the alliance performance and board interlocks in the U.S. between 2010-2015 and identify the difference between having an interlocking directorate when entering an alliance. Thus, this is

an historical event study. Our measurement of performance/success is the daily abnormal returns, in correlation with the announcement date of the alliance.

#### **4.0 Theoretical Foundation**

The theoretical foundation is based on research on board interlocks, strategic alliances, and alliance performance. This part first explains what a board interlock is, past research, antecedents, and outcomes of board interlocks. Thereafter, strategic alliances and measurements of alliance performance is reviewed.

#### **4.1 Board Interlocks**

A board interlock is the practice of members of a corporate board of directors serving on the boards of multiple organizations. Board interlocks is also popularly coined as interlocking directorates in the academic literature. Mizruchi (1996) defined a board interlock as a tie created by two firms sharing a common director.

Members, or directors, are defined as either inside directors or outside directors. Inside directors are directors whose main connection is with the focal firm. These typically include the Chief Executive Officer (CEO) and other chief officers. On the other hand, outside directors are people whose main connection is with other organizations than the focal firm (Mizruchi, 1996). The majority of outside directors of big corporations are chief officers of other big corporations, often financial institutions (Mizruchi, 1996). Hence, board interlocks are formed by both inside and outside directors.

Furthermore, board interlocks can be both direct and indirect. If a director of one corporation is also a director of the other, the corporations have a direct interlock. If a director of each corporation serves on the board of a third firm, the corporations have an indirect interlock (Sallinger, 2005).

##### **4.1.1 Previous Research**

During the 1970s and 1980s, research applying board interlocks thrived. With the rise of research on interorganizational relations, research on board interlocks come to be even more widespread in the 1990s. Research on board interlocks has received attention in many research areas, including management (Gulati & Westphal, 1999;

Shropshire, 2010), finance (Core et al., 1999) and sociology (Kono et al., 1998; Mizruchi et al., 2006).

Around thirty years ago, Mizruchi (1996) published one of the first reviews of the research on board interlocks to that date. A fundamental question of the board interlocks research has been and continues to be “What do interlocks do?” Mizruchi discussed the reasons for the formation of interlocks and found the most common to be collusion, cooptation and monitoring, legitimacy, career advancement, and social cohesion.

Given the importance of board interlocks and the explosion of research on the topic since Mizruchi’s review, Lamb and Roundy (2016) offered a new and updated review of board interlocks research. They suggested that board interlock studies can be broadly classified as focusing on either the antecedents or the outcomes of interlock activities (Lamb & Roundy, 2016).

Board interlocks reflect complex inter-organizational relationships. Researchers propose that board interlocks can help corporations cope with environmental uncertainty and dependence (Useem, 1984), provide access to diverse and unique information (Haunschild and Beckman, 1998), enable the spread of new corporate practices (Davis, 1991; Palmer et al., 1993) and serve as a signal of a firm’s quality (Higgins and Gulati, 2003; Kang, 2008). Additionally, board interlocks may be able to facilitate key processes, such as diffusion (Davis, 1991) and learning (Beckman and Haunschild, 2002), which can, in turn, impact firm performance (Davis and Cobb, 2010; Hillman et al., 2009).

#### **4.1.2 The Antecedents of board interlocks**

Board interlocks research with a focus on the antecedents of interlocks has typically been researched from the perspective of either the corporation, or of the director involved in the interlock.

From the perspective of the corporation, a common driver behind interlocks is seeking to obtain resources. Some directors believe that board interlocks can help their organizations to form links with other corporations that allows them to obtain

resources needed to reduce environmental uncertainty (Martin et al., 2015; Ong et al., 2003). This can for example be a financial interlock, i.e. organizations invite employees from financial organizations onto their boards in an effort to co-opt the institutions due to heavily indebtedness to a bank, which early studies explained as a response to resource dependency (Bunting, 1976; Dooley, 1969).

Besides financial interlocks, organizations also form interlocks with other corporations that control critical resources. An organization is more likely to create a board interlock with firms from markets that can affect the revenues of the focal firm (Burt, 1979). Burt found that firms desire board interlocks with firms in industries with which they have dependency and can obtain benefits from the interlocks, such as improving financial performance.

Other antecedents of interlock activities from a firm's perspective include monitoring, signaling and accessing human capital (Lamb & Roundy, 2016). Antecedents from a director's perspective include career advancement and gaining social ties (Lamb & Roundy, 2016). However, none of these are relevant to the scope of this study.

#### **4.1.3 The Outcomes of Board Interlocks**

The most common focus of board interlock studies is the outcomes of interlock activities (Lamb & Roundy, 2016). Popularly examined outcomes of board interlocks has been the effect on minimizing environmental uncertainty, diffusing strategies, influencing the reputation of the organization and influencing firm performance (Lamb & Roundy, 2016).

One of the most commonly explored outcomes of board interlocks is their potential effect on firm performance. Many theories have been used to examine the relationship between board interlocks and firm performance. These include agency theory (Haniffa & Hudaib, 2006), social networks theory (Cai & Sevilir, 2012), inter-organizational theories (Keister, 1998) and social capital theory (Horton et al., 2012). However, resource dependence theory is the theory that is most associated with finding positive influence on financial performance. The notion is that board interlocks can help organizations attain resources and information that can improve

performance (Davis & Cobb, 2010). Another aspect is that board interlocks may help firms to form alliances, which in turn can provide resources that is beneficial to firm performance (Gulati & Westphal, 1999). Other researches have suggested that firms that are embedded in the network of the directors can leverage social relations to perform economic exchanges, which can result in improved firm performance (Granovetter, 1985; Horton et al., 2012).

Many studies have found that board interlocks are positively related to firm performance (Cai & Sevilir, 2012; Haniffa & Hudaib, 2006; Harris & Shimizu, 2004). However, there are studies that did not find the same relationship (Fich & White, 2005). For instance, organizations with fewer board interlocks perform better than firms with more board interlocks (Fligstein & Brantley, 1992). The relationship between board interlocks and firm performance is inconsistent and complex. One study showed a positive relationship between an organization's share of outside directors in 1970 and firm performance relative to its industry in 1980, but no significant relationship between performance in 1970 and share of outside directors in 1980 (Baysinger & Butler, 1985). The complex and contradictory nature of these findings suggests that more research is needed to understand the nuances of the relationship between interlocks and firm performance.

#### **4.1.4 Critique and Legality**

Criticisms of board interlocks research have focused on three issues. The first is that interlocks fail to predict corporate behavior (Mizruchi, 1996; Stinchcombe, 1990; Zajac, 1988). A second criticism is that interlocks do not capture the complexity and richness of inter-firm networks. Past research often include board interlocks as the sole measure of inter-firm networks, overlooking other types of networks such as strategic alliances. Finally, the impact of interlock activities on firm performance is inconsistent. A main notion for the assumption of improved performance is access to resources and information otherwise not available.

By including strategic alliances where there are interlock activities, this paper broadens the perspective on the inter-firm networks that corporations exist in. Furthermore, instead of addressing firm performance where the findings have been



inconsistent, this paper addresses the alliance performance. By testing the impact of board interlocks on alliance performance, this paper helps finding the missing links and inconsistency in past research on interlocks and firm performance, by widening the scope and looking at alliance performance.

In the United States, the Clayton Act prohibits interlocking directorates by U.S. companies competing in the same industry, if those corporations would violate antitrust laws if combined into a single corporation. However, at least 1 in 8 of the interlocks in the United States are between corporations that are supposedly competitors (Wardrip-Fruin & Montfort, 2003).

#### **4.2 Alliance and performance**

When it comes to alliances, some researches place emphasis on the goal orientation and commitment of the alliance, supplying the definition with an initial purpose. One of these are expressed as; a formal agreement between two or more business organizations to pursue a set of private and common interests through the sharing of resources in contexts involving uncertainty over outcomes (Arino, 2001). This opens up to a new set of literature, focused on determining the underlying reasons to create a strategic alliance which indirectly classifies them. They may seek exploration or exploitation (Koza and Levin, 1998), connection of firms in different phases of their value chain or benefit from scale (Dussauge et al. 2000). Further, this leads the literature of strategic alliances into more details surrounding their classification and lifespan. Depending on the strategic alliance and its purpose, they might be temporary or enduring.

Given that the strategy literature is expressed and evaluated in terms of success, alliance performance has naturally attracted a ton of research attention. Despite this, alliance performance remains one of the least understood aspects of alliances (Das and Teng, 2003). This is in part due to empirical research hindrances. This naturally leads to the essence of the discussion, determining what an actual effective alliance means. There are two well researched streams, different by the way they view the alliance. Some focus at the link, the actual alliance between the firms, while others suggest the partnering firms forming the alliance should be the focus of performance measurement. Critique is also raised in the presence of this discussion, as partners may not have similar or even compatible objectives in the

alliances, which will make it hard to identify mutually agreeable performance criteria (Das and Teng, 2003).

The differences of opinion concerning the classifications of alliances, naturally disrupts the views on the best performance indicators. The diverse dynamics in their definitions cause different impacts on the strategic alliance performance. For instance, the management aspect varies vastly among the alliances (Gulati, 1995) and they are also likely to evolve in different pathways across their lifespan (Doz, 1996). Unsurprisingly, this leads to conflicting perceptions of the definition of alliance performance (Yan and Zeng, 1999). However, as with the definition of alliances, there is a common denominator, which is connected to goal accomplishments (Anderson, 1990; Beamish and Delios, 1997; Lin and Germain, 1998).

Drawing from the strategy literature, there are three recognizable measurements that depend on the goals; financial, operational performance and organizational effectiveness (Venkatraman and Ramanujan, 1986). Financial performance addresses the situation where the parties of the alliance agree on explicit financial goals. Operational performance focus on key success factors, that indirectly might lead to financial performance (Venkatraman and Ramanujan, 1986). The performance can hence be indicated by such key success factors. However, it is important to notice that financial performance is not always a part of the goals of an alliance (Anderson, 1990). The key success factors will in this case, still be of importance, as the operational success factors might be a measurement of effectiveness. Organizational effectiveness insinuates the contentment of the organization's goals, taking into account the interests of relevant actors. This is also widely discussed as its difficult to measure (Gawande and Wheeler, 1999).

#### **4.2.1 Abnormal Returns**

Another form of studies that have become increasingly rigorous in terms of quantitatively measuring alliance performance, is event studies. This is a method that generally helps examine the expected effect of an alliance on the value of participating firms. The rationale behind this methodology is an examination of “abnormal” changes in a partner firm's stock price, following an announcement

of a new alliance gives a good indication of informed traders' beliefs regarding the expected impact of that alliance on future cash flows of the firm. Although there is a fair amount of event studies concerning alliance performance in the strategy literature, there seems to be a certain consensus in most of the findings. Most of the studies find a positive abnormal return for the relevant firms following an announcement of the alliance with average positive returns varying from 0.01% (Das et al. 1998) to 1.78% (Anand and Khanna 2000) (Sampson and Silverman, 2009). Naturally, there are contradicting studies (Reuer and Koza, 2000) who find that this reaction is limited to the subset of their alliances that are likely to take place under significant information asymmetry (and hence investors view an alliance as favorable way to reduce such asymmetry). McGahan and Villalona (2005), find no significant effect when analyzing the stock market reactions in a comprehensive sample of deals by 86 members of the Fortune 100 from 1990-2000.

Research also discovered that the positive abnormal returns to participants associate this effect with enhanced value creation within the alliance; several of the studies explicitly draw the inference that alliances are successful mediums for learning, resource accumulation, or both (Koh and Venkatraman 1991; Kale et al. 2002). Sampson and Silverman (2009) on the other hand, suggest these arguments to be precipitate, lacking investigation of the effect of alliance announcements on the stock market reactions of rivals.

### **5.0 Data Collection and Analysis**

The fact that we are conducting a historical event study, naturally leads this thesis to be conducted using secondary data. The positives are that the data does exist, and we have access to the databases from our student privileges and some are available to us through university resources. LexisNexis and Securities Data Company (SDC) are the primary data sources and are both gained access to through the university resources. In addition to these, we have and will continue to look extensively into prior research on the area, both published journal papers as well as whitepapers published by consultancy companies, news articles and surveys concerning our area of interest. This will help obtaining a more complete understanding of the views of U.S. culture on board interlocks and alliances in particular.

### **5.1 Data Analysis**

To interpret the massive amount of data, we will use our prior experience in regressions using Excel and Stata. Some of the data cleansing will be done in the databases being used, and the rest will be done in Stata and Excel. As mentioned before, a lot of work will be done in preparing the data for analysis, before being able to do the needed regressions to identify correlations between the present board interlocks and the company's daily returns on the announcement dates. If we find Stata to be lacking the statistics, coding or mathematical interpretations we do believe are necessary we will use R-Studio. This is unfamiliar as of now and will require the needed time to get our grasp around the product.

### **5.2 Alliances**

We will choose a certain time-period, preferably a 6-year perspective, and compile information on the alliance announcements involving these firms in the time period. These will be retrieved from the recorded database in SDC on Alliances and Joint Ventures. SDC reports announcement dates for all alliances recorded in the database but these are not always accurate (Anand and Khanna, 2000). Therefore, we intend to check all announcement dates against relevant factors concerning other media related to that specific date to ensure. This will lead to a revised data sample, by dropping samples related to; non-reliable reports, announcement dates that are incorrect and news that might concern older or ongoing alliances which will disrupt the data. We will make sure there is no contamination by "confounding events" (Sampson and Silverman, 2009), that may lead to abnormal returns for the firm, which are unrelated to our event of interest.

Further, we will also pay attention to other unrelated events that may happen in our time-window, that may disrupt the abnormal returns measurements and contaminate our results. We do realize it will be near impossible to completely isolate our data from all unrelated events. However, we will exclude at least those events that most likely will disrupt a big portion of the data, by taking into account observations that cause these effects. This could for example be large firms, with a lot of influence, which are highly attractive to media publicity.

### **5.3 Stock Market Data (Abnormal Returns)**

In obtaining and observing daily returns (abnormal) as our measurement of alliance performance we will retrieve stock market data. We plan to collect daily stock price data along with the relevant daily benchmark local price index from the beginning of our undefined time period, for each firm. One source we might find applicable is the DataStream Advance and Center for Research in Security Prices (CRSP). We have however not decided on which database to use concerning the abnormal returns, and will pursue this area with our supervisor. This process might also lead to further sample attrition because firms that might not have sufficient stock price data to meet the minimum data requirement for estimation of marked model and computation of event aggregate abnormal returns (Sampson and Silverman, 2009).

#### **5.4 Board Interlocks**

For the board interlocks and identifying the interlocking directorates, we have used LexisNexis. This is a corporation providing computer-assisted legal research as well as business research and risk management services. We have access to the corporate affiliations, providing us with a database of the board of directors and executives, of all U.S. corporations. The raw material as of today contains all the information ranging from firm ID, subsidiaries, executive teams all the way to the different positions held by different employees. This data will be analyzed and revised to be a base for our analysis identifying the board interlocks aligned with the alliances from SDC. In other words, we will clean and prepare this data to provide data showing the number of seats each board member has assigned to his or her name, before creating the links to identify the alliances touched by this interlock. This was not part of our initial plan and creating our own database of board interlocks is an obstacle that pushed the research back, and requires extensive resources in terms of allocated time to the project.

#### **6.0 Status and Project Plan**

As of today, we are currently preparing and conducting initial analysis of the data. Our main data consist of SDC observations of alliances and joint-ventures, LexisNexis database with directors, executives and firm names. We are cleaning the data to only contain American alliances, based in the U.S. Currently, the board interlocks will need to be identified manually. So far, we have revised the data to only contain relevant variables (i.e. directors and executives), and identifying the

number of times their names appear across the list of firms. This will then be used to observe which firm they are currently sat on in the time period. Next step will then be to create a database with the directors and their board seats, creating our own database of board interlocks. This will then need to be cross-referenced with the alliances, to identify any cases where board interlocks occur between two firms engaged in a strategic alliance.

The last part of data preparation will be to address the strategic alliances with interlocking directorates versus the reference data in terms of abnormal return data collected. This will be used as a measurement to see whether the board interlocks will lead to any increase in returns. Based on the results of the data, we will address theory to depict what we believe can be a source of understanding. Some of the theories in mind are network theory and the aspect of asymmetrical information, to address the possible performance effect of board interlocks in strategic alliances.

### **6.1 The Road Ahead**

To finish our thesis within the beginning of June 2018, it is important to organize our time and tasks well and continuously work on the project. We have internally sat our milestones and important dates to be able to do this. We will also plot our plans in a Gantt chart that will work as a project management tool and guide us through the project (Saunders et al., 2009). Another critical factor for completing this thesis in the desired timeline is clear and open communication between the two of us, aligning our expectations throughout the project. We know each other well and do know the importance of time management ahead of this deliverable. We have put in place certain organizational tools for more effective communication and task management, including, Google Drive, and a shared Google Calendar for organizing events and regular meetings.