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ABSTRACT

JOINT VENTURE TERMINATION: FAILURE OR ADAPTATION?

By

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In the joint venture literature, termination is often considered analogous to failure, and the reasons for termination attributed to initial characteristics of the venture. This research argues that venture termination may arise due to adaptation instead of failure, and changes during the joint venture process, rather than initial formation conditions, are key drivers of joint venture termination. These changes extend beyond the boundaries of the joint venture to include parent firm strategy and the market environment.

Adopting a co-evolutionary theory view of joint ventures, this study investigates the influences of external change on the propensity of joint venture (JV) termination. It develops and tests a model of JV termination that incorporates JV performance as well as external change, including changes in parent firm overall strategy and in the market environment, as determinants of the propensity of JV termination.

Event history analysis is used to empirically test the model and a longitudinal study design is employed to examine the over time effects. The results confirmed that changes in parent firm overall investment strategy and governance strategy both significantly influence the propensity of JV termination. Different effects are also found for two types of JV terminations, i.e., dissolution and acquisition.

Based on the model, this study identifies two primary reasons for JV termination: low JV performance and changes external to the joint venture. While termination due to low performance is directly associated with failure, change-induced termination is a result of firm strategic adaptation.

This dissertation contributes to previous research in five ways. First, it provides an empirical test of co-evolutionary theory of alliances and further co-evolutionary theory in the context of joint ventures. Further, it identifies changes, rather than the initial JV conditions, as key drivers of JV termination. Third, it demonstrates the embeddedness of joint ventures in parent firm overall strategy and how JV termination can result from parent firm strategic adjustment. Fourth, it clarifies the relationship between JV termination and failure by showing termination can be firm strategic adaptation rather than failure. Lastly, it addresses the need for longitudinal studies in the literature by utilizing an event history methodology and time series data.

To my mother

献给我的母亲

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CHAPTER 1

INTRODUCTION

1.1. Overview of the problem

1.1.1. Joint venture termination and failure

Globalization and increasingly intense competition have brought a dramatic acceleration in joint venture formation. Nevertheless, most joint ventures are short-lived, with estimated termination rates reaching 50 percent or higher (Harrigan 1988; Parkhe 1993; Porter 1987). The high termination rate has been generally viewed as an indication of high failure rate (Park and Ungson 2001). Previous studies have used duration and survival as measures of joint venture performance, with termination indicating low performance (Chowdhury 1992; Harrigan 1988).

However, termination and failure are not the same because a joint venture may be terminated because it no longer fits into the parent firm's strategy and a long-lasting joint venture might be suffering from low performance (Yan and Zeng 1999). In business failure studies, termination is used as a measure of failure, because for an independent firm going out of business indicates failure. For joint ventures, however, the relationship between termination and failure is more complex. The existence and operation of a joint venture is not independent of the parent firms, and the termination of a joint venture is not always associated to low performance, but also possibly related to changed motivations of parent firms. From the parent firm's perspective, terminating a joint venture may not be a bad thing, especially considering joint ventures are often used an alternative form of investment that provides more flexibility than fully-owned subsidiaries. Therefore, to understand when JV termination results from failure, the reasons for termination need to be considered.

1.1.2. The reasons for JV termination: JV process and JV outcome

JV termination is an outcome of a joint venture. The life span of a joint venture starts with its formation and ends with its termination. During its life span, a joint venture experiences frequent changes and evolves over time (Day 1995; Doz 1996; Ring and Van de Ven 1994). JV process is the evolutionary process of a joint venture that is characterized by changes and adaptations (Ring and Van de Ven 1994).

Though the importance of studying the process of JV partnerships has been long recognized, very few studies have been done from this perspective. Among the limited process studies, most are conceptual or case studies (Doz 1996; Hamel 1991; Ring and Van de Ven 1994). Case studies have the advantage of developing new theories and investigating marketing issues in detail, but case studies cannot substitute for quantitative empirical studies in terms of the generalizability of theory testing.

More importantly, even fewer studies have related the partnering process to the outcome of a joint venture, investigating how the JV process influences the final outcome of a joint venture such as termination. Most previous studies on JV termination associate the reasons for termination with the initial formation conditions of the partnership, identifying factors such as ownership distribution among partners (Blodgett 1992), partner asymmetry (Harrigan 1988), joint venture type (Park and Russo 1996), and so on. Accordingly, the independent variables used in empirical studies are predominantly static, i.e., not varying over time. The initial conditions of a joint venture have important influences on the JV outcome. However, joint ventures experience frequent changes over the life span (Day 1995), and these changes that unfold after JV formation directly affect the JV outcome. Neglecting the JV process fails to consider a very important aspect of JV termination.

1.1.3. The reasons for JV termination: exogenous factors versus factors under JV management control

Further, JV studies have mainly focused on factors under JV management control, such as equity control (Blodgett 1992; Dhanaraj and Beamish 2004; Lu and Hebert 2005), managerial support (Steensma and Lyles 2000), cultural distance (Barkema et al. 1997; Park and Ungson 1997), etc. The influences of factors exogenous to a joint venture, such as competitive nature of the industry (Kogut 1988) and the strategies of parent firms, are largely neglected. While JV management factors reveal the managerial complexity of joint ventures and provide important explanation for JV termination, parent firm overall strategy and the market environment also have important influences on JV termination (Franko 1971; Kogut 1989). Recognizing the important influences of exogenous factors on JV termination can help clarify the relationship between JV termination and failure, because termination due to exogenous factors that are out of JV management control is not necessarily related to failure.

1.1.4. Types of JV termination

Lastly, most previous studies employ duration, longevity or survival as the dependent variable, not considering how a joint venture is terminated, i.e., dissolved (liquidation), or acquired by one of the parent firms (Barkema et al. 1997; Lu and Hebert 2005). The few exceptions are Kogut (1991), who studied only acquisition, including acquisition by a partner firm and by a third party, and Park and Russo (1996), who excluded acquisition by the parents from their analysis. But these studies did not simultaneously consider dissolution and acquisition or compare them. How a joint venture is terminated is related to the reason why it is terminated, and different

types of termination may be underlined by different considerations of the parent firms. The importance of distinguishing JV termination types not only falls out of the perspective of viewing joint ventures within the context of parent firms' overall strategy (Reuer and Koza 1998), but also lies in understanding the reasons of termination and how they are related to joint venture failure (Hennart et al. 1998).

In sum, previous research has limited our understanding of JV termination in three ways. First, initial JV formation conditions have been given the most attention in neglect of factors that necessarily change over time. Secondly, most studies emphasize factors under JV management control, omitting exogenous forces such as parent firm overall strategy and the market environment. These focuses underestimate the influence of external changes on JV termination, and consequently fail to consider strategic adaptation as a possible motivation for JV termination. Without considering external change as a possible reason for JV termination, the previously found high correlation between low JV performance and termination may be spurious. Lastly, not distinguishing between different types of JV termination inhibits our understanding of the reasons for JV termination.

1.2. The co-evolutionary theory view

Co-evolutionary theory of alliances is an extension of co-evolutionary theory in the context of alliances. It offers a new perspective of the alliance evolution in relation to the market environment and parent firm strategy (Koza and Lewin 1998; Lewin et al. 1999; Volberda and Lewin 2003). This theory views alliances in the context of the adaptation choices of a firm (Koza and Lewin 1998). In this view, alliances are embedded in parent firm overall strategy, and co-evolve with parent firm overall strategy and the market environment (Koza and Lewin 1998). It emphasizes

change and adaptation over time, and views alliance evolution through series of reevaluation and readjustment cycles. During the process of alliance management, parent firms learn about the alliance and its environment and periodically reevaluate the alliance, which in turn leads parent firms to make adjustment to the alliance by moving away from the initial conditions (Doz 1996). It also argues that alliance evolution takes place not only within an alliance itself, but also together with the market environment and the parent firm's overall strategy, therefore co-evolution (Koza and Lewin 1998).

The co-evolutionary theory perspective provides a very good foundation to incorporate both change over time and exogenous factors to the study of JV termination. It brings a new perspective of viewing the outcome of a joint venture as a result of the co-evolutionary process (Arino and de la Torre 1998; Doz 1996; Ring and Van de Ven 1994). With this perspective, JV termination itself can be viewed as an adjustment action of the parent firm based upon its changed evaluation of the joint venture. Studying JV termination within the co-evolutionary framework will also improve our understanding of JV termination by showing how JV termination may result from firm strategic adaptation rather than failure.

1.3. This dissertation study

1.3.1. Definitions

1. Strategic alliances and joint ventures. A strategic alliance is a contractual arrangement between two or more independent companies that choose to carry out a project or operate in a specific business area by coordinating the necessary skills and resources jointly rather than operating on their own or merging their operations (Dussauge et al. 2000). A joint venture is a contractual arrangement that creates a

separate legal entity in which the parent firms hold ownership interests. According to these definitions, a joint venture is one type of strategic alliance that is equity-based. This study is in the context of joint ventures.

2. JV Termination. JV Termination is defined as the end of a joint venture, including dissolution (liquidation) and acquisition (i.e., when a joint venture is acquired by one of the parent firms).

3. JV Failure. JV Failure is defined as unplanned termination without achieving the goal of a joint venture. This definition is consistent with the work of Park and Ungson (2001), who pointed out that "unexpected" termination is more directly related to failure, and Khanna (1998), who argued that not achieving the benefits is an indication of failure. Failure is looked at from the parent firm's perspective, rather than the success or failure of a joint venture in isolation.

4. Open-ended joint ventures. Open-ended joint ventures are joint ventures that are expected to last for an unlimited time, without a prespecified duration. To look at JV co-evolution and termination, this study only considers open-ended joint ventures.

1.3.2. Purpose of the study

This study develops a model of JV termination. Employing a co-evolutionary theory view of alliances, this study views JV termination as an outcome of the JV process characterized by changes in parent firm strategy and the market environment. Considering both exogenous factors and over time change, it incorporates external change as a determinant of JV termination. In addition, two types of JV termination, i.e. dissolution and acquisition, are separately analyzed and compared.

The research addresses the call for process studies in the joint venture literature. Relating the evolutionary process to the outcome of a joint venture, this study highlights the difference between change-induced terminations and terminations resultant from low performance and argues that change-induced terminations are firm adaptations, not failures.

Distinguishing between JV termination and failure can provide a better understanding of JV success and failure as well as new insights for JV management. Realizing that joint ventures are not supposed to last forever, the management philosophy of joint ventures may change from simply trying to avoid JV termination to actively preparing, predicting and even planning for terminations. Also, often calculated from terminations, the high JV failure rate known in the literature may not reflect the actual percentage of failed joint ventures. The distinction can help to empirically clarify the actual JV failure rate.

1.3.3. Research questions

This study intends to answer the following research questions.

1. What factors influence the propensity of JV termination?
2. Given the impact of JV performance, what is the influence of external change, in both the market environment and parent firm overall strategy, on the propensity of JV termination?
3. Are the influences of the above factors different for JV dissolution and acquisition?

1.3.4. Research methodology

A conceptual framework is developed based on co-evolutionary theory of alliances, and tested with event history analysis (EHA) and time series data. EHA is suitable for studying JV termination because it models the possibility of the occurrence of an event (JV termination is the event in this case) and captures the influences of explanatory variables over time.

1.4. Overview of the dissertation

This chapter provides an overview of this dissertation research. The confusion between JV termination and failure is discussed and the importance of distinguishing these two concepts is emphasized. Looking at reasons for JV termination is necessary to distinguish between JV termination and failure. The shortcomings of current research on JV termination are identified and it is pointed out that the neglect of JV process and exogenous factors such as parent firm overall strategy and market environment prevents current research from recognizing external change as a possible source of JV termination. The research questions are then presented.

Chapter 2 reviews the previous literature on JV termination within the co-evolutionary theory view of alliances. The arguments of co-evolutionary theory of alliances are discussed and applied to the context of JV termination. Previous literature on JV termination is then reviewed, and the need for adopting a co-evolutionary theory view in JV termination research is pointed out.

Chapter 3 develops the conceptual model of JV termination. Hypotheses are developed for empirical testing.

Chapter 4 presents the research methodology. Detailed information is provided for sampling frame, data collection method, measures, data sources, and event history analysis method.

Chapter 5 presents and discusses the analysis results. Explanations for the testing results are provided.

Chapter 6 evaluates the findings and contributions of this study and presents the conclusions. Implications for academics and managers, limitations and opportunities for future researched are discussed.

CHAPTER 2

REVIEW OF JV TERMINATION RESEARCH WITHIN THE CO-EVOLUTIONARY THEORY OF ALLIANCES

2.1. Co-evolutionary theory of alliances

The co-evolutionary theory of alliances is an extension of the co-evolutionary theory in the context of alliances. Co-evolutionary theory has recently been more prominent in the management and organization theory literature (Baum 1999; Lewin and Volberda 1999). It provides a fresh view of organizational adaptation and selection that integrates the interplay between the adaptation of organizations, their competitive dynamics and the environment organizations are embedded in. It argues that organizations and their environment are interdependent and evolve together. It introduces the notion of "multi-levelness" and "hierarchical nestedness", which indicates that evolution takes place at multiple levels (i.e., within organizations, between organizations, and between organizations and the market environment), and the units of evolution are nested within one another (Baum and Singh 1994; Lewin et al. 1999; March 1994).

Built on the co-evolutionary theory view, the co-evolutionary theory of alliances views alliances in the context of the adaptation choices of a firm (Koza and Lewin 1998) and emphasizes the embeddedness of an alliance in parent firm overall strategy. An alliance is part of the parent firm's strategic portfolio, and alliance decisions are functions of parent firm overall strategy. During the alliance process, an alliance co-evolves with parent firm overall strategy and the market environment (Koza and Lewin 1998). Because an alliance is a special organizational form, the co-evolution of an alliance with the parent firm is a form of evolution between

organizations, i.e., evolution takes place not only within an alliance but also between the alliance and its parent firms. At the same time, an alliance participates in competition in its market and co-evolves with the market environment. The co-evolution of alliances with their parent firms and the market environment is an example of multi-level and hierarchically nested evolution. Specifically, the key arguments of co-evolutionary theory of alliances include the following.

First, the alliance process is characterized by change and adaptation over time, and alliances evolve through series of reevaluation and readjustment cycles. As a special form of organizations, alliances are dynamic systems of adaptation and evolution (Arino and de la Torre 1998; Doz 1996; Ring and Van de Ven 1994). After an alliance is formed, parent firms are involved in an on-going process of reevaluation and readjustment of the alliance, which starts with the initial conditions but go beyond the initial conditions (Doz 1996). During the process of alliance management, parent firms learn about the alliance and its environment, and periodically reevaluate the alliance, which in turn leads parent firms to make adjustment to the alliance by moving away from the initial conditions (Doz 1996). An alliance evolves through a sequence of learning-reevaluation-readjustment cycles over time (Doz 1996; Ring and Van de Ven 1994).

Secondly, alliance evolution takes place not only within an alliance itself, but also together with the market environment and the parent firm's overall strategy, therefore it is referred to as co-evolution (Koza and Lewin 1998). The parent firm's reevaluation and readjustment go beyond the alliance itself to include the alignment of the alliance with the overall strategy of the parent firm and the market environment (Doz 1996; Franko 1971).

Alliances compete with other firms in its market. The level of competition influences the competitive position of an alliance in the market (Porter 1985; Porter 1980). Changes in market competition alter the competitive position of an alliance, and an alliance constantly adjusts to these changes to achieve an advantageous position (Kumar and Nti 1998). For example, increased level of competition and increased market power of other firms in the same market weakens an alliance's competitive position. When these changes occur, the parent firm reevaluates the alliance and adjustment actions are taken either to strengthen its position or exit the market when the cost of strengthening it is higher then the benefit (Doz 1996; Franko 1971). Through this process of reevaluation and readjustment, alliances evolve with changes in the market environment.

At the same time, an alliance is part of the strategic portfolio of the parent firm. It is set up to carry out certain activities, such as production, marketing or R&D, which contribute to the overall strategy of the parent firm. Changes in the parent firm's overall strategy alter the relative contribution and importance of the alliance to the parent firm, which induces the parent firm to reevaluate the alliance and take adjustment actions regarding the activities or structure of the alliance (Arino and de la Torre 1998). Through this process of reevaluation and readjustment, alliances evolve with parent firm overall strategy.

Lastly, the outcome of an alliance is a result of the co-evolutionary process (Arino and de la Torre 1998; Doz 1996; Ring and Van de Ven 1994). During the co-evolutionary process, changes induce the parent firms to reevaluate the alliance, and changed evaluation motivates the parent firms to take adjustment actions regarding the alliance (Arino and de la Torre 1998; Doz 1996; Ring and Van de Ven 1994).

Terminating an alliance itself is an adjustment action of the parent firm based upon its changed evaluation of the alliance. Incremental readjustment actions are often taken to improve the situation before terminating an alliance, but unsuccessful incremental adjustments will reinforce previous evaluation, which reaches a point where the evaluation of the alliance falls below alternative arrangements accomplishing the same purpose, and consequently leads to termination of the alliance (Arino and de la Torre 1998; Doz 1996). Though small changes may not immediately lead to termination, the occurrence of changes increases the need for readjustment and instability in an alliance (Yan 1998), therefore it increases the propensity of termination of an alliance.

The application of co-evolutionary theory in the context of alliances has been limited to some case studies (Arino and de la Torre 1998; Koza and Lewin 1999). Though some studies have included a time dimension (Doz 1996; Gulati 1995), the majority of alliance studies are cross-sectional, and research that considers the time dimension tends to remain at the level of conceptual development and fails to empirically capture the process of alliance evolution (Doz 1996). Little systematic attention has been paid to the influence of the evolutionary process on the alliance outcome. Rarely has research explicitly considered alliances as embedded within the strategy portfolio of parent firms and/or the market environment they are in (Koza and Lewin 1998). The co-evolution of alliances with parent firm strategy and the market environment remains an unexplored area of research (Koza and Lewin 1998).

2.2. JV termination within a co-evolutionary perspective

Joint ventures are a special form of alliances. Joint ventures also co-evolve with their market environment and parent firm overall strategies. JV termination, the

outcome of a joint venture, results from the co-evolutionary process of the joint venture with its market environment and parent firm overall strategy. JV termination is the parent firm's adjustment actions based on its changed evaluation of the joint venture. Viewing JV termination within the perspective of JV co-evolution provides new understandings of JV termination and reveals several needs in JV termination research.

2.2.1. JV Termination is a result of the co-evolutionary process.

During the co-evolutionary process, parent firms are involved in the reevaluation of a joint venture and take adjustment actions accordingly. Changes in the market environment and parent firm overall strategy alter the parent firm's evaluation of the joint venture and motivate the parent firms to take readjustment actions. Termination of a joint venture, encompassing both dissolution and acquisition, is an adjustment action of the parent firms. Dissolution is a decision to withdraw investment and is associated with lowered evaluation of a joint venture. Acquisition of a joint venture can be associated with increased evaluation of the joint venture because it enables the parent firm to fully exploit the benefits of the joint venture. Acquisition can also be associated with lowered evaluation because it provides the parent firm more control over the joint venture so as to improve the JV situation. Therefore, JV termination is the parent firm's adjustment actions based on its changed evaluation of the joint venture. It is resultant from changes in the JV co-evolutionary process.

2.2.2. Change during the co-evolutionary process drives JV termination

Joint ventures experience frequent changes over the life span (Day 1995). The changes that unfold after JV formation induce the parent firms to reevaluate the joint venture (Kumar and Nti 1998; Ring and Van de Ven 1994) and take readjustment actions (Kumar and Nti 1998). Though the co-evolutionary process starts with the initial conditions, the cycle of reevaluation and readjustment quickly brings the joint venture away from the initial conditions (Doz 1996). Changes after JV formation invoke parent firm reevaluation and readjustment of a joint venture and are sources of instability. Changes, rather than initial formation conditions, cause changed evaluation and consequently increase the propensity of termination.

2.2.3. Parent firm overall strategy and the market environment have important influences on JV termination

Joint ventures are subjected to environmental change and shift in parent firm overall strategies (Kumar and Nti 1998). The parent firm's reevaluation of the joint venture also takes into consideration the market environment and the parent firm's over all strategy (Kumar and Nti 1998). Changes in the market environment and in parent firm overall strategy are exogenous to a joint venture, but they alter the parent firm's assessment of the joint venture, and lead to adjustment actions. Thus, besides the characteristics of the joint venture itself, factors that are exogenous to a joint venture, such as parent firm overall strategy and the market environment, also have important influences on JV termination.

2.2.4. JV Termination can be resultant from firm adaptation rather than failure

Same as the decision of forming a joint venture, the decision of terminating a joint venture is a function of the parent firm's overall strategy portfolio and market competition. During the co-evolutionary process, the parent firm's reevaluation of the joint venture is based upon not only the performance of the joint venture but also the alignment of the joint venture with parent firm strategy and the market environment. Undesirable performance induces lowered evaluation of a joint venture. Changed market environment alters the competitive position of a joint venture in the market, and changed parent firm overall strategy alters the position of a joint venture in the parent firm overall strategic portfolio, which both change the parent firm's evaluation of the joint venture and consequently increase the propensity of JV termination. Therefore besides low performance, change in parent firm overall strategy and the JV market environment is also a cause of JV instability and termination (Yan 1998).

If a joint venture is terminated due to changes in parent firm overall strategy or in the market environment, it is a result of the parent firm's adaptive activities, rather than a failure. From the parent firm's perspective, terminating a joint venture may not be a bad thing; on the contrary, it can be beneficial to the parent firm's overall strategic development. Viewed within the context of the co-evolutionary process, JV termination is not necessarily failure, and change-induced terminations are firm adaptation activities rather than failure.

2.2.5. Commonalities and differences between JV dissolution and acquisition

A joint venture can be terminated through dissolution or acquisition. Dissolution is the liquidation of a joint venture. Acquisition in this study is defined as when a joint venture is acquired by one of the parent firms. Both dissolution and

acquisition are resultant from changed reevaluation during the co-evolutionary process. The mechanisms underlining these two types of JV termination have both commonalities and differences.

For commonalities, both dissolution and acquisition terminates the cooperation between parent firms, which eliminates the benefits and costs of cooperation. Benefits of cooperation involve resource sharing, while costs of cooperation include the exposure of firm capabilities to the partner and the risk of having these valuable capabilities appropriated by the partner (Doz and Hamel 1998). When a joint venture is dissolved or acquired, the parent firms are no longer involved in cooperation; therefore they are not be able to enjoy the benefits of resource sharing, and at the same time no longer face the risk of appropriation.

Differences between the mechanisms of JV dissolution and acquisition also exist. Both dissolution and acquisition can be adaptive actions of the parent firm, but they are driven by different motivations and have different implications. From the investment strategy perspective, dissolution is a divestment decision, while acquisition is related to the parent firm's expansion and increased resource commitment in the JV business (Kogut 1991). From the perspective of governance strategy, dissolution is the change of governance form from joint venture to market transaction, while acquisition is the change of governance form from joint venture to internal operation. Acquisition is the parent firm's internalization decision to achieve more control over the joint venture (Buckley and Casson 1996). In addition, dissolution terminates a joint venture through liquidation, which usually involves direct loss. In the case of acquisition, the joint venture stays in operation, which enables the parent firms to avoid the loss of liquidating assets. Thus, to fully

understand the reasons and implications for JV terminations, it is necessary to separately study JV dissolution and acquisition.

In sum, JV termination research within the co-evolutionary perspective requires:

1. Distinguishing between JV termination and failure. JV termination can result from firm adaptation instead of failure.
2. Considering JV termination as a result of the co-evolutionary process and study change and adaptation during the co-evolutionary process of a joint venture with its market environment and parent firm overall strategy. This involves studying joint ventures over time, by using longitudinal time series of adaptation events and measures of rates of change or pace of change (Koza and Lewin 1998; Lewin et al. 1999; Lewin and Volberda 1999), and incorporating a historical perspective by considering a long period of time (McKelvey 1997).
3. Considering the embeddedness and co-evolution of a joint venture with parent firm overall strategy and the market environment. This requires researchers to incorporate exogenous factors related to parent firm overall strategy and the market environment, not only a joint venture itself, in studying the reasons for JV termination (Reuer and Koza 1998).
4. Distinguishing between and separately model JV dissolution and acquisition. JV dissolution and acquisition both terminate a JV partnership, but different mechanisms underline these two types of termination, and they have different implications for the parent firm (Hennart et al. 1998; Reuer and Koza 1998).

2.3. Previous research on JV termination

The co-evolutionary perspective has not yet been applied in JV termination research. Many previous studies on JV termination have been empirically driven, without explicitly employing a theoretical framework to develop a testable model (e.g. Blodgett 1992; Hennart et al. 1998; Kogut 1989; Park and Ungson 1997). Other studies have adopted theoretical perspectives including transaction cost theory (Dhanaraj and Beamish 2004; Lu and Hebert 2005; Park and Russo 1996), interfirm learning (Barkema et al. 1997; Dussauge et al. 2000; Parkhe 1991), real option theory (Chi 2000; Kogut 1991), and social exchange (Steensma and Lyles 2000). However, these theoretical perspectives do not explicitly incorporate the evolutionary view. For example, transaction cost theory identifies equity control as an element of governance structure, but does not explicitly address how governance structure may change and therefore influence the outcome of a joint venture. The lack of a co-evolutionary perspective has limited previous JV termination research to:

1. Viewing JV termination as analogs to failure.
2. Focusing on JV initial formation conditions and neglecting over time change.
3. Neglecting factors exogenous to a joint venture, such as parent firm overalls strategy and the market environment.
4. Not separately modeling JV dissolution and JV acquisition.
5. Empirical tests being mainly cross-sectional with static variables, rarely considering over time effects.

2.3.1. JV termination and failure

JV duration and survival are widely used as performance measures (Reuer and Koza 1998), assuming that long-lasting ventures are successful and short-lived ones are failures. Though some researchers recognized the difference between JV termination and failure (Yan 1998; Yan and Zeng 1999), termination's relation to failure is not well studied. Park and Russo (1996) defined failure as JV dissolution or JV spun-off to third parties, but do not include acquisition by one partner. While this is a practical definition, it does not provide theoretical insight into the relationship between termination and failure.

2.3.2. Focus on initial formation conditions

Due to the lack of a perspective of change in theorization and the limitation of data availability, previous research has focused on relating the JV outcomes to initial characteristics of the joint venture or its parents (Doz 1996), such as JV type, whether parents are direct competitors, etc. Table 1 presents a summary of key JV termination studies. Even some of these characteristics may change over time, usually only the initial conditions are included in the model, without considering changes over time after formation. For example, parent experience, culture difference, differences in parent age and size, etc, may change after a joint venture is formed, but in most studies, only the conditions at JV formation are used.

Focusing on initial conditions assumes that initial conditions drive the evolution of a joint venture, and if a joint venture is wrongly configured, the misspecification can not be compensated in the following process of evolution (Doz 1996). However, changes frequently occur during the cooperation process, and firms are involved in reevaluation and readjustment of the joint venture, which brings the

joint venture away from initial conditions (Doz 1996). The changes in the adjustment process have important influences on the outcome of a partnership (Arino and de la Torre 1998; Doz 1996). Focusing only on initial conditions underestimates the influence of changes and creates a deterministic bias (Arino and de la Torre 1998; Doz 1996).

Table 1. Previous studies on joint venture termination

Article	Dependent variable	Independent variables	Time-dependent variables
Lu and Xu 2006	Survival	Parent age, parent size, and JV industry relatedness.	No
Lu and Hebert 2005	Survival	Equity control	No
Dhanaraj and Beamish 2004	Survival	Equity ownership	No
Hennart and Zeng 2002	Longevity	National culture difference	No
Park and Ungson 2001	Dissolution	Interfirm rivalry, managerial complexity.	Conceptual
Chi 2000	Acquisition and divesture	Value of the JV option	Conceptual
Dussauge, Garrette and Mitchell 2000	Reorganization, takeover, dissolution, and continuity	Scale versus linkage alliances	No
Steensma and Lyles 2000	Survival	Management control imbalance, ownership control imbalance, managerial support, technical support.	No
Tas and Teng 2000	Instability = unplanned major changes or dissolution	Differences between cooperation level and competition level, Differences between rigidity level and flexibility level, differences between short-term orientation and long-term orientation.	Conceptual
Hennart, kim and zeng 1998	Longevity	JV related product, JV formed through acquisition, parent experience, market growth in JV sector, parent size.	No

Barkema, Shenkar, Vermeulen and Bell 1997	Longevity	Experience, culture distance.	No
Park and Ungson 1997	Dissolution	Culture distance, differences in strategic scope, size and age, direct competitors, overlap in product market scope between JV and the partners, involvement of technology transfer.	No
Park and Russo 1996	Dissolution and spun-off to third parties, not including acquisition by one of its partners	Direct competitors; pattern of interdependence (integrative vs. sequential); past experience; multiple linkage between partners; number of partners.	No
Barkema and Vermeulen 1997	Longevity	Culture difference	No
Kogut 1991	Acquisition, including selling to a third party and to the partner.	Industry concentration, annual industrial growth, annual growth residual, JV type (Manufacturing, marketing and R&D).	Yes
Parkhe 1991	Longevity	Interfirm diversity	No
Kogut 1989	Instability = termination, including dissolution, sold out to the partner or a third party.	Number of ties between parents, R&D intensive, marketing intensive, scale intensive, market growth, market concentration change.	Yes
Harrigan 1988	Survival and duration	Partner asymmetry, diversification relatedness.	No
Kogut 1988	Termination	Ownership control, parent size, market growth, market concentration, marketing activity.	No
Franko 1971	Instability = holdings of the MNE cross the 50% or 95% ownership lines, or the interests of MNE are sold, or the venture is liquidated.	Parent corporate characteristics, including organizational stage, foreign experience, percentage of foreign sales, total sales, advertising intensity, product tradability, etc.	No

2.3.3. Neglecting of exogenous factors

Co-evolutionary theory indicates JV evolution takes place not only within a joint venture but also together with its market environment and parent firm overall

strategy. Factors under JV management control, such as scope of JV activities, are directly related to the evolution and termination of a joint venture. Factors concerning the market environment and parent firm overall strategy are exogenous to a joint venture, but they also have influences on JV evolution and consequently the JV outcome. Parent firm overall strategy is the overall strategic plan of the parent firm, for instance, overall investment plan or product portfolio, and it is not concerned with the joint venture itself. Thus, parent firm overall strategy is exogenous to a joint venture. This study categorizes the factors influencing JV termination into two categories: factors under control of JV management and exogenous factors, i.e., factors exogenous to a joint venture and out of the control of JV management.

Previous research has investigated factors on the characteristics of a joint venture itself, such as JV type, JV activities and number of partners; the differences or relationships between parents, such as culture difference, whether parents are direct competitors, parent differences in age, size and scope; the relationship between parents and a joint venture, such as product relatedness and equity control; and the market environment, such as JV industry growth and market concentration.

According to this classification, factors on the characteristics of a joint venture, the differences or relationships between parents, and relationship between parent and a joint venture are all elements of JV management and under control of JV management. Understandably, factors under control of JV management have been the focus of investigation. The only studies that incorporated market environment variables are Kogut (1991; 1989). The influence of parent firm overall strategy is rarely considered. In an early study of multinational corporations and international joint ventures by Franko (1971), parent firm characteristics such as percentage of foreign sales, advertising intensity were found to influence the JV outcome. Franko

(1971) pointed out that multinational firms' decisions on international JV terminations depend on the multinational firms' international business strategies. However, this line of research that relates JV outcomes to parent firm overall strategy was not well extended by later studies.

Looking at JV management factors reveals the managerial complexity of joint ventures and provides important explanations for JV termination. However, it neglects the influences of factors exogenous to JV management, such as parent firm overall strategy and the market environment, which also have important influences on JV termination. Joint ventures are embedded in and evolve with partner firm overall strategies and the market environment (Koza and Lewin 1998). From the parent firms' strategic viewpoint, a joint venture may be terminated because the conditions supporting the existence of the joint venture have changed. Recognizing the important influence of exogenous factors on JV termination can help clarify the relationship between JV termination and failure, because termination due to exogenous factors out of JV management control is not related to failure.

Table 2 summaries the JV termination factors studied in previous research within the classification of change versus initial formation conditions, and factors under JV management control versus factors exogenous to a JV.

Table 2. A classification of explanatory variables in previous JV termination studies

	Initial formation conditions	Changes after formation
Factors under control of JV managers	JV type; Number of partners; JV experience; Ownership distribution among partners; Involvement of director competitors; Involvement of technology transfer; Partner asymmetry in terms of age, size and market overlap; Cultural distance; Multiple linkage between partners[1].	Case studies on internal cooperative and competitive dynamics between partners[2].
Factors exogenous to a JV	Industry growth; Industry concentration; Parent firm age and size[3].	Industry growth; Industry concentration[4].

1. Dussauge, Garette and Mitchell 2000; Barkema, Shenkar, Vermeulen and Bell 1997; Park and Ungson 1997; Park and Russo 1996; Blodgett 1992; Kogut 1989; Harrigan 1998.
2. Doz 1996; Ring and Van de Ven 1994; Hamel 1991.
3. Hennart, Kim and Zeng 1998; Kogut 1991; Kogut 1989.
4. Kogut 1991; Kogut 1989.

In sum, the focus on initial JV formation conditions and the neglecting of exogenous factors has limited our understanding of JV termination. One consequence is that external change is largely neglected as a possible reason for JV termination. The literature relates JV termination to low performance and considers termination as analogous to failure. Without considering external change, the previously found relationship between low JV performance and JV termination may be spurious. Investigating changes of JV conditions over time can provide new understanding of the relationship between termination and failure, as termination may not be a problem if it represents adaptations to changes (Gomes-Casseres 1987).

2.3.4. Different types of JV termination

Most previous studies do not separate the analyses across different types of terminations. These studies employ duration, longevity or survival as the dependent variable, not considering how a joint venture is terminated (i.e., dissolved, or acquired by a parent firm) (Barkema et al. 1997; Lu and Hebert 2005). The few exceptions that took termination type into consideration are Kogut (1991), who studied only acquisition, including acquisition by a partner firm and by a third party, and Park and Russo (1996), who excluded acquisition by the parents from their analysis. The only study that simultaneously investigated both dissolution and acquisition is by Hennart et al (1998), who studied exit through liquidation and sales for Japanese stakes in US.

How a joint venture is terminated is related to the reason why it is terminated, and different types of termination reflect different considerations of the parent firms. Focusing only on general behaviors without investigating specific behavior is not sufficient to understand the reasons for these behaviors and may cause bias (Warshaw 1980b; Warshaw 1980a). The importance of distinguishing and simultaneously considering different types of JV termination not only falls out of the perspective of viewing joint ventures within the context of parent firms' overall strategy (Reuer and Koza 1998), but also lies in understanding the reasons of termination and how they are related to joint venture failure (Hennart et al. 1998).

2.3.5. Methods for empirical testing

The majority of JV termination studies have been cross-sectional. With the exception of Kogut (1991; 1989), who investigated time-dependent variables such as market growth and market concentration, other empirical studies have included only

static variables. The dominance of static variables prevents empirical studies from examining the influence of the co-evolutionary process on JV outcome.

Logistic regression and event history analysis have been used in empirical testing. While logistic regression models the occurrence of an event, it does not consider the timing of the event, i.e., a joint venture that is terminated one year after formation is treated same as a joint venture terminated five years after formation, which omits important information of termination. Event history analysis not only has the advantage of considering both the occurrence of termination and the timing of termination at the same time, but also allows for the modeling of event probability over all observation periods, and can readily incorporate time-dependent covariates to capture the effects of non-static explanatory variables over time. However, only a few recent JV termination studies have applied this method, and due to the lack of time-dependent covariates, the advantage of event history models in incorporating over time change was not fully utilized.

This study tests co-evolutionary theory of alliances in the context of JV termination by developing and empirically testing an event history model with a longitudinal research design. It addresses the needs for a co-evolutionary perspective in JV termination research by:

1. Explicitly considering changes during the co-evolutionary process as determinants of JV termination. It also incorporates an historical perspective by covering the JV life span, starting from its formation and ending at its termination.
2. Incorporating antecedent factors exogenous to a joint venture, including parent firm overall strategy and the market environment.
3. Separately modeling and comparing JV dissolution and acquisition.

4. Distinguishing between JV termination and failure by showing JV termination due to external change is firm adaptation rather than failure.
5. Utilizing event history analysis and a longitudinal research design with time-dependent covariates to examine the influences of change over time.

CHAPTER 3

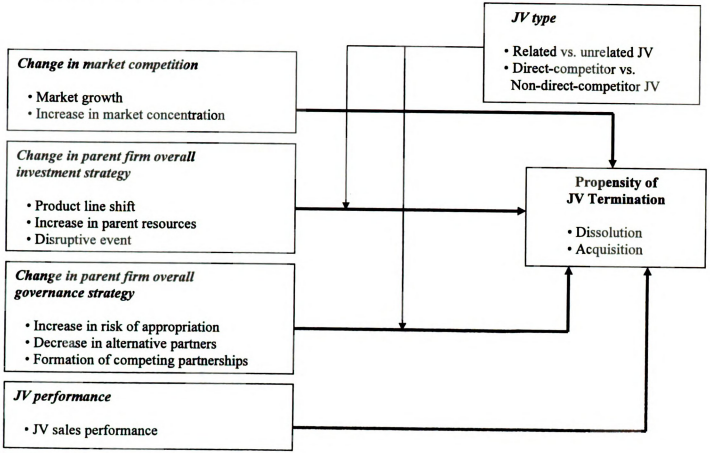
THE CONCEPTUAL MODEL AND HYPOTHESES

3.1. The conceptual model

This dissertation study applies co-evolutionary theory of alliances in the context of joint ventures and develops a model of JV termination. JV termination is viewed as resultant from the co-evolutionary process of a joint venture with its market environment and parent firm overall strategy. Terminating a joint venture is an adjustment action of the parent firm based upon its changed evaluation of the joint venture, which is induced by changes in the co-evolutionary process.

Change in market competition and change in parent firm overall strategy are incorporated as determinants of the propensity of JV termination. The model not only applies co-evolutionary theory of alliances by incorporating JV embeddedness and change variables, but also connects the theory to previous theoretical development in alliance research by explicitly considering two types of parent firm strategies, i.e., investment strategy and governance strategy. Figure 1 presents the conceptual framework.

Figure 1. A model of joint venture termination



The dependent variable in the model is the propensity of JV termination. Two types of JV termination are considered: dissolution and acquisition. Dissolution is when a joint venture is liquidated, and acquisition is when a joint venture is acquired by one of the parent firms.

According to co-evolutionary theory of alliances, a joint venture, as a special form of alliances, evolves together with its market environment and the parent firm's overall strategy. Therefore, both change in market competition and change in parent firm overall strategy affect the propensity of JV termination.

Specifically, change in market competition alters the competitive position of a joint venture in its market and makes the joint venture more or less effective for the parents to achieve their strategic goals (Kumar and Nti 1998). This leads to the parent firm's changed evaluation of the joint venture, and consequently increase the propensity of dissolving or acquiring the joint venture (Doz 1996; Franko 1971; Kumar and Nti 1998). Thus, change in competition in the JV market has an impact on the propensity of JV termination.

Two types of parent firm overall strategies are considered, i.e., investment strategy and governance strategy. For the parent firms, a joint venture is both an investment decision and a governance decision (Buckley and Casson 1998a; Buckley and Casson 1998b; Cristina Lopez and Esteban 2004). A joint venture is formed when the parent firm invests in a new production, a new marketing program or a new research project etc. The new investment is part of the parent firm's overall investment strategy. At the same time, an investment can be carried out through forms other than a joint venture, such as internal operation through wholly-owned subsidiaries (Anderson and Gatignon 1986; Buckley and Casson 1998a). The decision of internal operation or partnering with other firms is a governance choice, and it is

part of the parent firm's governance strategy (Buckley and Casson 1998a; Buckley and Casson 1998b). Similarly, termination of a joint venture may be due to the parent firm's motivation of withdrawing the investment or changing the governance form, i.e., internalizing the JV activity or switching to a different JV partner. Therefore two fundamental parent firm strategies, investment strategy and governance strategy, need to be considered.

JV performance is included as an antecedent not only because JV performance directly influences a firm's decision of continuing or terminating a joint venture, but also because JV performance is representative of the factors under JV management control. While changes in the market environment and parent firm overall strategy are exogenous to a joint venture, JV performance captures the ultimate result of JV management and therefore the influences of factors under control of JV management. JV characteristics such as number of partners, differences or relationships between parents such as culture difference and parent asymmetry, and the relationship between parents and a joint venture such as equity control, all influence JV performance, and their influences on JV outcome can be represented by JV performance.

Further, by including JV performance in the model, this study is able to look at the influence of exogenous factors given JV performance. If with the effect of JV performance controlled for in the model, exogenous change factors are found to significantly influence the propensity of JV termination, then it can be concluded external change is an important factor and should not be neglected.

In addition, JV performance represents the extent to which a joint venture has fulfilled its intended benefits. Unfulfilled benefits are directly related to the definition of failure (Park and Ungson 2001), as opposed to change in market competition and parent firm overall strategy, which is a result of parent firm adaptive actions.

Therefore the inclusion of JV performance also enables us to distinguish between JV terminations and failure by showing different reasons for termination.

Thus, four sets of factors are included as determinants of the propensity of JV termination: change in market competition, change in parent firm overall investment strategy, change in parent firm overall governance strategy, and JV performance. These four set of factors influence the parent firm's reevaluation and readjustment of a joint venture and consequently the propensity of JV termination.

Based upon the commonalities and differences between JV dissolution and acquisition, different hypotheses for the propensity of dissolution and acquisition are developed when necessary. For commonality, both dissolution and acquisition terminates the cooperation between parent firms, which eliminates both the benefits of cooperation, such as resource sharing, and costs of cooperation, such as risk of having capabilities appropriated by the partner (Doz and Hamel 1998). For differences, from the investment strategy perspective, dissolution is a divestment decision, while acquisition indicates the parent firm's expansion actions (Kogut 1991). From the governance strategy perspective, dissolution is the change of governance form from joint venture to market transaction, while acquisition is the change of governance form from joint venture to internal operation, and it is the parent firm's internalization decision to achieve more control over the joint venture. These rationales are applied in hypothesis development.

Further, the model considers JV type as a moderator, and proposes that the effects of antecedent factors on the propensity of JV termination are different for different types of joint ventures. Two classifications of joint ventures are considered: related JV versus unrelated JV; direct-competitor JV, when the parents are direct competitors, versus non-direct-competitor JV, when the parents are not direct

competitors. The following section first develops hypotheses for the main effects of the antecedent factors, and then proceeds to the moderating effects of JV type.

3.2. Hypotheses

Hypotheses on the effects of antecedent factors on the propensity of JV termination are developed in this section. Hypotheses are developed regarding the change variables. The effects of level variables are controlled for when it is necessary. Different hypotheses are developed for JV dissolution and acquisition when necessary.

3.2.1. Change in market competition

Joint ventures compete with other firms in the market. Market competition in this study refers to competition in the industry of the joint venture, not that of the parent firms. To examine change in market competition, this study combines the co-evolutionary theory view with industry organization literature, which has a long history of studying market competition in an industry (Porter 1985; Porter 1980; Scherer 1980). In the industry organization literature, two fundamental characteristics used to describe market competition are market growth and market concentration (Caves 1980; Caves and Porter 1980; Horowitz 1984).

Market growth

Market growth indicates increasing market demand in an industry, and it is an important consideration for firms' market entry and exit decisions (Horowitz 1984). Joint ventures are formed by parent firms to explore new opportunities in the JV industry (Park et al. 2002). Joint ventures in a fast growing market enjoy greater market potential and more future opportunities.

During the JV co-evolutionary process, the level of market growth in a joint venture's market may vary, and it influences the parent firm's reevaluation and readjustment of the joint venture. Through the reevaluation and readjustment process, a joint venture co-evolves with its market. When market demand is quickly growing, the parent firm develops positive evaluation of the joint venture, because increasing market demand brings more potential customers and future opportunities for expansion, and a joint venture in a fast-growing market is less likely to go bankrupt (Hennart et al. 1998). The increased positive evaluation of a joint venture reduces the propensity of dissolving the joint venture. Therefore market growth has a negative impact on the propensity of JV dissolution. Formally stated:

H1a. Market growth is negatively associated with the propensity of JV dissolution.

Joint ventures are used as a way to expand to new markets, and firms are ready to increase resource commitment when market condition is favorable (Kogut 1991). High market growth signals favorable market conditions. In presence of high market growth, the parent firm develops positive evaluation of the joint venture investment, and internal operation becomes a more attractive alternative because internalizing the JV activity enables the parent firm to solely exploit the benefits from the joint venture (Kogut 1991). Acquiring the joint venture is an adjustment action taken by the parent firm to fully exploit the benefits of the fast growth in the JV market. Therefore parent firms are more likely to acquire a joint venture in a fast growing market. Formally stated:

H1b. Market growth is positively associated with the propensity of JV acquisition.

Increase in market concentration

Market concentration is the level of seller concentration in a market. It is associated with the level of rivalry between existing competitors, which is a key element of the competitive forces in a market (Porter 1985; Porter 1980). It also reflects the size distribution of firms (Caves 1980), with higher level of market concentration indicating the concentration of market power to a few large firms. In a highly concentrated market, firms are faced with large and powerful competitors, and the minimum scale needed for a firm to compete in the market is larger (Caves 1980).

During the JV co-evolutionary process, concentration level of the JV market may change. When there is an increase in market concentration and market power is more concentrated to a few firms, the joint venture's competitive position in the market is changed, which induces the parent firm's reevaluation and readjustment actions of the joint venture. When market power is more concentrated to a few firms, the joint venture is faced with more difficult competitive environment and its competitive position in the market is weakened, unless increase in market concentration ratio is directly caused by growth of the focal joint venture, which is not a concern in this study because of the simultaneous consideration of JV sales performance in a longitudinal study design. The weakened competitive position induces the parent firm to lower its evaluation of the joint venture. Given the existence of other alternative investment opportunities and the cost of supporting the joint venture, the possibility of dissolving a joint venture is increased. Therefore, with other conditions the same, the propensity of JV dissolution is increased when there is an increase in market concentration in the JV market. Formally stated:

H2a. Increase in market concentration is positively associated with the propensity of JV dissolution.

When a market is more concentrated to a few firms, the average firm size is increased and the minimum scale needed to participate in competition is higher (Caves 1980). The parent firm's evaluation of a joint venture with respect to internalization is changed, and internalization becomes a more attractive alternative, because integrating the JV activity and directly participating in competition in the JV market enables the parent firm to more effectively utilize the parent firm's market power and strengthen the joint venture's competitive position in the market. As a readjustment action, the parent firm is more likely to acquire and achieve full control of the joint venture. Therefore:

H2b. Increase in market concentration is positively associated with the propensity of JV acquisition.

3.2.2. Change in parent firm overall investment strategy

Firms' investment strategies have been a central topic of research for strategic management. Products and resources are viewed as two sides of the firm (Wernerfelt 1984). Product line management and resource allocation within a firm are both among the most important investment decisions facing top management (Bergh 2001; Wernerfelt 1984). They are both directly related to joint ventures because a joint venture is part of the parent firm's overall investment portfolio. Changes in the parent firm's product line or resource availability alter the position of a joint venture in the parent firm's overall investment portfolio, and induce the parent firm to reevaluate the joint venture and consequently take readjustment actions regarding the existence of the joint venture. Therefore, changes in parent firm product lines and resources are both included as antecedent factors influencing the propensity of JV termination.

In addition, disruptive events to the parent firm, such as acquisition of the parent firm by another company, also lead to changes in the parent firm's overall investment strategy and induce adjustment decisions regarding the existence of a joint venture. Therefore disruptive events are also considered as a determinant of the propensity of JV termination.

Product line shift

Product diversification has been a popular strategy pursued by many firms (Ramanujam 1989). Firms engage in active product line management, developing and implementing plans that concern which business to be in and which to avoid (Day 1977). Product line management activities include supporting newly introduced products, consolidating the product range to focus on one segment, and divesting products, etc. (Day 1977). Product line shift in this study is defined as a shift in the primary business a company is in. When a company's primary business changes, its overall product portfolio is affected, with some products receiving more support while others less, and some products being withdrawn from the market (Burton 1994; Devinney and Stewart 1988).

Joint ventures are used as strategic vehicles to more efficiently explore new market opportunities (Contractor and Lorange 1988; Gomes-Casseres 1987). The JV product is part of the parent firm's product portfolio (Kogut 1988), and JV termination is related to the parent firms' investment or divestment decisions regarding the JV product. During the JV co-evolutionary process, the parent firm experiences product line shift, which alters the JV product's relative position in the parent firm's overall product portfolio and changes the parent firm's evaluation of the joint venture.

Parent firm product line may shift away or closer to the JV business. The shift of parent firm primary business away from the JV business reduces the relative importance of the joint venture in the overall product portfolio. Given that different products share limited resources and even same customer base under some circumstances (Bergh 2001; Burton 1994), lowered evaluation of the joint venture increases the propensity of the parent firm dissolving the joint venture to focus on core business. The shift of the parent firm's primary business closer to the joint venture business increases the relative importance of the joint venture to the parent firm, and increased evaluation of the joint venture increases the propensity that the parent firm acquires the joint ventures to achieve full control over its operation (Buckley and Casson 1996). Therefore, when the parent firm is involved in product line shift, the likelihood of terminating a joint venture is higher, either dissolution or acquisition, as compared to when there is no such change. Formally stated:

H3a. Parent firm product line shift is positively associated with the propensity of JV dissolution.

H3b. Parent firm product line shift is positively associated with the propensity of JV acquisition.

Increase in parent firm resources

Looking at firms from the perspective of their resource endorsement has a long tradition in economics, and the traditional concept of corporate strategy is also phrased in terms of the resource position of a firm (Andrews 1974). The more recent resource based view extends the concept of resources from the traditional physical resources to intangible resources and emphasizes the importance of rare resources for firm performance (Peteraf 1993; Wernerfelt 1984).

From the resource perspective, joint ventures are formed to access and combine resources of different firms (Doz and Hamel 1998; Dyer and Singh 1998). Parent firm resources, though not directly invested in the joint venture, represent the potential of resource sharing in a joint venture (Doz and Hamel 1998) because the parent firm may decide to bring more resources into the joint venture at later stage of the cooperative process. Further, even if parent firm resources are not directly invested in a joint venture, parent firms can benefit from the transfer of intangible resources through their interaction in a joint venture (Chung 2001). Joint ventures often utilize the same manufacturing facilities and technology as the parents, share same brand name or marketing program with the parents, or carry out related R&D programs. Through the coordination of such activities, parent firms transfer their intangible resources to the joint venture and learn from each other (Chung 2001).

During the JV co-evolutionary process, both the joint venture and the parent firms experience changes. Besides managing a joint venture, the parent firm also proceeds with its overall strategic development and its resources may increase or decrease during the process. Increase in parent firm resources increases the potential of resource sharing and learning between JV partners, and consequently raises the parent firm's evaluation of the joint venture. Increased evaluation enhances the partner's willingness to continue the partnership and lowers the propensity of termination, including dissolution and acquisition, because both dissolution and acquisition of a joint venture terminates the cooperation between partners and deprives the opportunity of resource sharing and learning.

Specifically, this study considers three types of resources that are shared during the JV process, i.e., manufacturing resource, marketing resources and R&D resources. Manufacturing resources are resources utilized during the production

process, such as buildings, machines, equipments, and related technologies and procedures, etc. The parent firm's manufacturing resources are not directly invested in a joint venture, but they can be shared with the joint venture, and manufacturing knowledge, such as operation management procedures, can be transferred from the parent firm to the joint venture during the process of cooperation. Increase in parent firm manufacturing resources raises the potential for sharing these resources and learning manufacturing knowledge in the partnership. Thus, during the co-evolutionary process, increase in parent firm manufacturing resources increases the parent firm's evaluation of the joint venture and consequently reduces the propensity of dissolving or acquiring the joint venture, as both dissolution and acquisition terminates the opportunity of resource sharing and learning between JV parents. Therefore:

H4a. Increase in parent firm manufacturing resources is negatively associated with the propensity of JV dissolution.

H4b. Increase in parent firm manufacturing resources is negatively associated with the propensity of JV acquisition.

Marketing resources are resources utilized to carry out marketing activities, such as market research, promotion programs, advertising, etc. Marketing resources of the parent firms are not directly invested in a joint venture, but because a joint venture often shares the same brand name or marketing program with its parent, marketing resources invested in the parent firms reinforce the marketing image of the joint venture product therefore provide support to the joint venture. More importantly, the parent firm's knowledge on marketing activities or the market itself can be transferred to the joint venture through management interaction during the process of cooperation. During the co-evolutionary process, increase in parent firm marketing

resources increases the potential for sharing these resources and learning marketing knowledge in the partnership, and raises the parent firm's evaluation of the joint venture, which consequently reduces the propensity of dissolving or acquiring the joint venture, as both dissolution and acquisition terminates the opportunity of resource sharing and learning between JV parents. Therefore:

H5a. Increase in parent firm marketing resources is negatively associated with the propensity of JV dissolution.

H5b. Increase in parent firm marketing resources is negatively associated with the propensity of acquisition.

Parent firm R&D resources can also be shared with a joint venture because the joint venture often carries out similar research and development activities or share similar technological bases. The intangible R&D knowledge can be transferred to a joint venture through management interaction during the cooperative process. Increase in parent firm R&D resources increases the potential for knowledge transfer between parents in the JV partnership, and consequently raises the parent firm's evaluation of the joint venture. Therefore, during the co-evolutionary process, an increase in parent R&D resources reduces the propensity of dissolving or acquiring the joint venture, as both dissolution and acquisition terminates the opportunity of resource sharing and learning between JV parents. Therefore:

H6a. Increase in parent firm R&D resources is negatively associated with the propensity of JV dissolution.

H6b. Increase in parent firm R&D resources is negatively associated with the propensity of JV acquisition.

Further, among the three types of resources, R&D resources are of a higher degree of ambiguity because R&D activities involve complex technologies and are

exploratory in nature (Cummings and Teng 2003). Complexity and ambiguity of knowledge reduces the effectiveness of knowledge transfer (Nonaka 1994; Simonin 1999; Spender 1996), therefore transfer of parent firm R&D knowledge is relatively more difficult than manufacturing and marketing resources. Because of the difficulty in transferring R&D resources, though increase in parent firm R&D resources increases the potential for resource sharing and learning between JV parents, the potential increase is not as much as for manufacturing or marketing resources. Thus for the same resource increase, the parent firm's evaluation of the joint venture does not rise as much for R&D resources as for manufacturing and marketing resources. Therefore, it is hypothesized that the effects of increase in parent firm R&D resources on the propensity of JV termination is not as strong as the effects of increase in manufacturing and marketing resources. The same argument applies to both JV dissolution and acquisition. Formally stated:

H7a. The effect of increase in parent firm R&D resources on the propensity of JV dissolution is not as strong as the effects of increases in parent firm manufacturing and marketing resources.

H7b. The effect of increase in parent firm R&D resources on the propensity of JV acquisition is not as strong as the effects of increases in parent firm manufacturing and marketing resources.

Disruptive event

During the JV co-evolutionary process, the parent firm may experience some events that are disruptive to its overall strategy, such as being acquired by or merged with other firms. When a parent firm experiences strategically disruptive events, the overall strategy of the parent firm is subjected to change. The resultant change in

parent firm overall strategy induces the parent firm to reevaluate the joint venture's relative position in its overall strategic portfolio and take adjustment actions, which influences the existence of a joint venture. Through this reevaluation and readjustment process, the joint venture co-evolves with its parent firm's overall strategy.

This study considers one type of disruptive event: when the parent firm is acquired by or merged with another firm. When merger and acquisition (M&A) happen to the parent firm, adjustment is required for the new firm to integrate previous business. Post merger integration involves changes from operation to management and strategy, and often with replacement of the top management team (Goh 2001; Zollo and Singh 2004). During the integration process parent firm overall strategy experiences significant changes, which alter the necessity or importance of a joint venture in the parent firm overall strategic plan. The changed evaluation of a joint venture puts the existence of a joint venture into question. The propensity of dissolving or acquiring the joint venture is increased compared to before the M&A event. Formally stated:

H8a. The propensity of JV dissolution is increased when the parent company is acquired by or merged with another company.

H8b. The propensity of JV acquisition is increased when the parent company is acquired by or merged with another company.

3.2.3. Change in parent firm overall governance strategy

A joint venture is not only an investment for the parent firm, but also a form of governance for the investment activities (Buckley and Casson 1996). When a firm invests in a certain product or activity, it can choose from different governance forms including internalization, market contracts, and joint ventures (Buckley and Casson

1996). Firms engage in adjusting their governance strategies to achieve the optimal governance form. The termination decision of a joint venture is part of the parent firm's governance adjustment, as both JV dissolution and acquisition are changes of governance forms. Dissolution is a change from joint venture to market transaction, and acquisition is a change from joint venture to internalization. Both dissolution and acquisition of a joint venture terminates the cooperation between JV parents.

As the classic theory in governance literature, transaction cost theory explains firms' governance decisions in interfirm partnerships with the match between governance form and exchange attributes so as to reduce transaction cost (Rindfleisch and Heide 1997; Williamson 1985; Williamson 1975). Due to the existence of opportunism, in a partnership, self-interest seeking firms may involve in activities that are detrimental to the other partner, such as appropriating the technology of the partner. The risk of having its technology appropriated by the partners contributes to transaction cost and influences on firm' governance choice. Therefore risk of appropriation is considered as a governance strategy variable in the model.

Factors that influence the level of dependence between partners are also found to have impacts on firms' governance decisions. High level of dependence enhances trust, commitment and long-term orientation in partnerships (Ganesan 1994; Goodman and Dion 2001), which serves a form of relational governance (Heide and John 1992). Dependence contributes to the stability and continuity of a partnership (Ganesan 1994; Goodman and Dion 2001; Kumar et al. 1995). Two factors that influence the level of dependence, i.e., alternative partners and competing partnerships (Heide and John 1988; Pfeffer and Salancik 1978), are included as governance variables in the model.

Increase in risk of appropriation

When two firms enter a joint venture, their unique knowledge or capabilities are exposed to the risk of appropriation by the partner (Hamel 1991). During the JV co-evolutionary process, the level of potential risk of appropriation may change as the parent firms' technology structures change. Though the parent firms' decisions of entering the joint venture indicate their acceptance of a certain level of risk, change in risk of appropriation after JV formation induces the parent firms to reevaluate the situation and adjust the governance form accordingly.

An increase in risk of appropriation indicates more need for the parent firm to protect its knowledge and higher level of transaction cost for the joint venture. When risk of appropriation increases, the parent firm's reevaluation of the joint venture as compared to other governance forms, such as market transaction or internalization, is lowered, because other governance forms prevent the exposure of firm knowledge to the partner. In presence of an increase in risk of appropriation, the parent firm is more motivated to change the governance form from joint venture to market transaction or internalization, which results in dissolution and acquisition of the joint venture respectively. Thus, the propensity of dissolving or acquiring a joint venture is increased when the risk of appropriation in the partnership increases. Formally stated:

H9a. Increase in risk of appropriation is positively associated with the propensity of JV dissolution.

H9b. Increase in risk of appropriation is positively associated with the propensity of JV acquisition.

Decrease in alternative partners

In this study, alternative partners for the focal parent firm (P1) are defined as firms that are in the same industry as the other partner firm (P2) and have the intention to carry out activities in the same industry as the focal joint venture. These firms can serve as alternative partners for the focal parent firm. The more alternative partners, the less dependent the focal parent firm is on the current partner, because the parent firm is able to switch to other partners (Pfeffer and Salancik 1978).

During the JV co-evolutionary process, the number of alternative partners for the parent firm may change. When there is a decrease in the number of alternative partners, the dependence of the focal parent firm on its current partner is increased because it is more difficult to switch partners. Though dependence exists at the start of a joint venture, increased dependence after JV formation induces the parent firms to reevaluate the situation and to adjust its decisions accordingly. Through this process of reevaluation and readjustment, the joint venture co-evolves with its parent firms.

Increased dependence makes the JV partnership more critical in the parent firm's overall strategy and increases the parent firm's positive evaluation of the joint venture. The parent firm is more motivated to continue the dependent partnership, and less likely to dissolve or acquire the joint venture, as both these actions will terminate the cooperation. Therefore:

H10a. Decrease in alternative partners is negatively associated with the propensity of JV dissolution.

H10b. Decrease in alternative partners is negatively associated with the propensity of JV acquisition.

Formation of competing partnerships

It is common that one firm is involved in more than one partnerships (Doz and Hamel 1998). Some of these partnerships may serve similar purposes for the parent firm, for instance, they may operate in the same industry as the focal JV. Competing partnerships in this study are defined as other partnerships that are formed by the focal parent firm and are in the same industry as the focal JV. These partnerships are competing with the focal JV in the sense that they are to a certain degree substitutable for the focal JV and they compete for similar resources from the parent firm.

During the JV co-evolutionary process, the parent firm may form other competing partnerships. Formation of competing partnerships reduces the dependence of the parent firm on the focal joint venture because it provides the possibility of switching the JV business to the competing partnerships (Pfeffer and Salancik 1978). Though dependence exists at the start of a joint venture, reduced dependence after JV formation induces the parent firms to reevaluate the joint venture and adjust its decisions accordingly. Decreased dependence makes the focal JV partnership less critical to the parent firm and consequently lowers the parent firm's evaluation of the focal joint venture. The parent firm is more likely to discontinue the JV partnership in presence of reduced dependence, and the propensity of JV dissolution and acquisition is both increased. Therefore:

H11a. Formation of competing partnerships is positively associated with the propensity of JV dissolution.

H11b. Formation of competing partnerships is positively associated with the propensity of JV acquisition.

3.2.4. Joint venture performance

JV performance directly influences the parent firm's evaluation of the joint venture. Undesirable performance lowers the joint venture's contribution to the overall strategy of the parent firm, and consequently the parent firm's evaluation of the joint venture. Firms are more likely to dissolve a low-performing partnership than a well-performing one (Porter 1987). Therefore:

H12a. JV performance is negatively associated with the propensity of JV dissolution.

Joint ventures are used as a way to expand to new markets, and firms are ready to increase resource commitment when market conditions are favorable (Kogut 1991). Good JV performance indicates favorable market conditions. In presence of high JV performance, the parent firm raises its evaluation of the joint venture, and internal operation becomes a more attractive alternative because internalizing the JV activity enables the parent firm to solely exploit the benefits from the joint venture (Kogut 1991). Acquiring the joint venture is an adjustment action taken by the parent firm to fully exploit the benefits of the joint venture. Therefore parent firms are more likely to acquire a well-performing joint venture. Formally stated:

H12b. JV performance is positively associated with the propensity of JV acquisition.

3.2.5. Joint venture type

The effects of antecedent factors on JV termination are proposed to be different for different types of joint ventures. Two classifications of joint ventures are considered: related JV versus unrelated JV; and direct-competitor JV, when the

parents are direct competitors, versus non-direct-competitor JV, when the parents are not direct competitors.

Related JV versus unrelated JV

From the product portfolio perspective, the joint venture's product can be related or unrelated to the parent firm's product (Harrigan 1988; Luo 2002b). In this study, a related JV is a joint venture that is in the same industry as the parent firm; whereas unrelated JV refers to the scenario when the joint venture and the parent firm are not in the same industry (Harrigan 1988; Luo 2002b).

When the JV product is related to the parent firm's primary product, the parent firm has more knowledge or capability in managing the JV activity (Luo 2002b). The diversification literature has found related diversification is more likely to be persistent (Harrigan 1988; Luo 2002a; Pennings et al. 1994), while unrelated diversification suffers from higher exit rate (Harrigan 1988; Hennart et al. 1998; Luo 2002a). With regard to acquisition, when the JV product is closely related to the parent firm's core product, the parent firm is more likely to have the capability needed to internalize (acquire) the JV activity. Therefore the propensity of dissolution is lower for related JVs than for unrelated JVs, while the propensity of acquisition is higher for related JV than unrelated JV.

Besides the direct effect, which is controlled for, this study hypothesizes that related versus unrelated JVs plays a moderating role in the relationship between change in parent firm overall investment strategy and the propensity of JV termination. From the product aspect, during strategic adjustment, parent firms are more likely to change lines of business that are with different profiles, and products that are closely related to the firm's primary business are given priority (Chang 1996).

While changes in parent firm overall investment strategy alter the evaluation of a related JV, parent firms are less willing to take adjustment actions toward a related JV, as compared to an unrelated JV. From the resource aspect, parent firm resources are more transferable to a related JV than to an unrelated JV (Luo 2002b), and accessing unique resources plays a more important role in a related JV. Therefore it is expected the effects of covariates regarding investment strategy change to be different for related and unrelated JVs.

Specifically, when there is a product line shift in the parent firm's strategy, the relative importance of a joint venture in the overall strategic portfolio is reevaluated and necessary adjustment actions are taken. Because a related JV is more closely related to the parent firm's primary business and plays a more important role in the parent firm's strategic portfolio, more efforts are made to keep this investment stable (Chang 1996), therefore the continuity of a related JV is less likely to be influenced by changes in the parent firm's product line. Therefore, the effects of product line shift on JV dissolution and acquisition are weaker for related JVs than for unrelated JVs. Considering the positive association between product line shift and the propensity of JV dissolution and acquisition, the interaction effect of product line shift and related JV is hypothesized to be negative. Formally stated:

H13a. The interaction between product line shift and related JV has a negative effect on the propensity of JV dissolution.

H13b. The interaction between product line shift and related JV has a negative effect on the propensity of JV acquisition.

Increases in parent firm manufacturing, marketing and R&D resources provide larger potential of resource sharing for the parent firms and reduces the propensity of JV dissolution and acquisition. For related JVs, the parent firm's resources are more

transferable to the joint venture, which is in the same industry as the parent firm (Luo 2002b). When parent firms set up a related JV, accessing unique resources plays a more important role, as compared to an unrelated JV where the resources are less transferable. Therefore increased potential of resource sharing is more likely to enhance the continuity of a related JV than an unrelated JV. Thus it is hypothesized that the influence of parent firm resource increase is stronger for related JVs than for unrelated JVs. Considering the negative association between increase in parent firm resources and the propensity of JV dissolution and acquisition, the interaction effects of related JV and increase in parent manufacturing, marketing and R&D resources are hypothesized to be negative. H13 to H15 state the hypotheses for the interaction effects of related JV and increase in manufacturing, marketing and R&D resources respectively:

H14a. The interaction between increase in parent manufacturing resources and related JV has a negative effect on the propensity of JV dissolution.

H14b. The interaction between increase in parent manufacturing resources and related JV has a negative effect on the propensity of JV acquisition.

H15a. The interaction between increase in parent marketing resources and related JV has a negative effect on the propensity of JV dissolution.

H15b. The interaction between increase in parent marketing resources and related JV has a negative effect on the propensity of JV acquisition.

H16a. The interaction between increase in parent R&D resources and related JV has a negative effect on the propensity of JV dissolution.

H16b. The interaction between increase in parent R&D resources and related JV has a negative effect on the propensity of JV acquisition.

During the JV co-evolutionary process, disruptive event such as parent firm M&A changes the parent firm's overall strategy and induces the parent firm to reevaluate the role of a joint venture in the overall strategic plan. Because related JV is more closely related to the parent firm's primary business and a plays a more important role in the parent firm's strategic portfolio, parent firms try to keep this investment stable and related JVs are given priority in the process of strategic adjustment (Chang 1996). Therefore the continuity of a related JV is less likely to be influenced by disruptive event as opposed to an unrelated JV. Therefore, the effects of disruptive event on JV termination, including dissolution and acquisition, are weaker for related JVs than for unrelated JVs. Considering the positive association between disruptive event and the propensity of JV dissolution and acquisition, the interaction effect of disruptive event and related JV is hypothesized to be negative. Formally stated:

H17a. The interaction between disruptive event and related JV has a negative effect on the propensity of JV dissolution.

H17b. The interaction between disruptive event and related JV has a negative effect on the propensity of JV acquisition.

Direct-competitor JV versus non-direct-competitor JV

When JV parents are direct competitors, they are involved in competition both inside and outside of the joint venture, and the relationship between JV partners are more competitive than otherwise (Park and Russo 1996). Due to the competitive nature, the risk of opportunistic behavior is higher and parent firms are more

concerned about the protection of self-interest (Park and Russo 1996). When the risk of appropriation increases, it influences the parent firm's evaluation of the joint venture more when the parents are direct competitors than when they are not. Considering the positive main effect of increase in risk of appropriation, the interaction effect between direct-competitor JV and increase in risk of appropriation is hypothesized to be positive. Formally stated:

H18a. The interaction between increase in risk of appropriation and direct-competitor JV has a positive effect on the propensity of JV dissolution.

H18b. The interaction between increase in risk of appropriation and direct-competitor JV has a positive effect on the propensity of JV acquisition.

Decrease in alternative partners reduces the propensity of JV dissolution and acquisition because it raises the level of dependence between JV partners, which supports the continuity of the JV partnership. When JV parents are in the same industry, not only they compete with each other in the market, but also their resources and capabilities are more similar and substitutable than when parents operate in different industries. When the number of alternative partners decreases, the parent firm has more flexibility of obtaining the needed resources internally instead of becoming more dependent on the current partner. Therefore the level of dependence between partners is not influenced by the number of alternative partners as much in a direct-competitor JV as it is in a non-direct-competitor JV. Consequently, the effects of decrease in alternative partners on the propensity of JV dissolution and acquisition are not as strong for a direct-competitor JV as for a non-direct-competitor JV. Considering the negative main effect of decrease in alternative partners, the interaction effect between direct-competitor JV and decrease in alternative partners is hypothesized to be positive. Formally stated:

H19a. The interaction between decrease in alternative partners and direct-competitor JV has a positive effect on the propensity of JV dissolution.

H19b. The interaction between decrease in alternative partners and direct-competitor JV has a positive effect on the propensity of JV acquisition.

Formation of competing partnerships increases the propensity of JV dissolution and acquisition because it provides substitutes for the focal JV partnerships and reduces the level of dependence between current parents. When current parents directly compete with each other in the market, their JV partnership is subjected to higher level of competition and conflict (Doz and Hamel 1998), and reduced dependence is more likely to cause instability in the partnership. Therefore, the influence of formation of competing partnerships on the propensity of JV dissolution and acquisition is stronger for direct-competitor JVs. Considering the positive main effects of formation of competing partners, the interaction effect between formation of competing partnerships and direct-competitor JV is hypothesized to be positive. Formally stated:

H20a. The interaction between formation of competing partnerships and direct-competitor JV has a positive effect on the propensity of JV dissolution.

H20b. The interaction between formation of competing partnerships and direct-competitor JV has a positive effect on the propensity of JV acquisition.

3.3. Further statements

Based upon the above hypotheses, this study also proposes the following statements. By testing the model, it seeks evidences for these statements:

1. Change during the JV co-evolutionary process is a cause for JV termination, including both dissolution and acquisition. If the variables regarding changes in the market environment and parent firm overall strategy show significant effects on the propensity of JV dissolution and acquisition, with the effects of corresponding level variables controlled for, then it can be concluded that change is a cause for JV dissolution and acquisition.

2. As a result of the co-evolution of a joint venture with parent firm overall strategy and the market environment, factors exogenous to the joint venture, such as changes in parent firm overall strategy and the market environment, have equally important impact on JV termination, including both dissolution and acquisition. If with JV performance being controlled for, these exogenous factors show significant effects on the propensity of JV dissolution and acquisition, then it can be concluded that exogenous factors are important antecedent factors of JV termination, and JV termination can be resultant from parent firm strategic adjustment.

3. Based upon the model, this study intends to identify two primary reasons for JV termination: low JV performance and external change. External change is the change in factors that are exogenous to a joint venture, including change in the market environment and parent firm overall strategy. The model simultaneously tests the effects of external change and JV performance on the propensity of JV termination, including both dissolution and acquisition.

4. By identifying the two primary reasons for JV termination, this model intends to show that JV termination is not necessarily failure. If a joint venture is terminated due to low performance then it is associated with failure; but if it is terminated due to external change, then it is not necessarily a failure, but rather a result of strategic adaptation.

5. By distinguishing and separately modeling JV dissolution and acquisition, this model aims to show that although dissolution and acquisition both terminate a JV partnership, they are driven by different motivations and have different implications for the parent firm. If different effects of the antecedent factors are found for JV dissolution and acquisition, then it can be concluded that different mechanisms underline JV dissolution and acquisition.

CHAPTER 4

RESEARCH METHODOLOGY

Event history analysis is used to empirically test the model and is suitable for the study because it allows for the modeling of event probability over all observation periods, and can incorporate time-dependent covariates to capture the effects of non-static explanatory variables over time. Specifically, semiparametric Cox models are employed to minimize bias arising from incorrect parametric specification for JV termination. Multiple data collection methods are used to obtain time series data, with secondary data from various public sources complemented by survey and interviews with parent companies.

4.1. Model formulation

Event history analysis looks at the hazard rate of an event, which is defined as the conditional probability of the event occurring at time *t* given that it has not occurred until time *t*-1 (Allison 1984; Allison 1995). In this study, the events are JV termination. It looks at the likelihood of a joint venture being terminated at a certain time point, given that it has survived the past.

From previous discussion, this study identified two types of JV termination, i.e., dissolution and acquisition. These two types of terminations are modeled as competing risks. A competing risk situation is where the occurrence of one event removes the individual from the risk of all other types of events (Allison 1995; Box-Steffensmeier 2004). In this context, dissolution and acquisition compete with each other in the sense that a joint venture can only be terminated through one of the two ways, i.e., dissolution or acquisition. A dissolved joint venture is removed from the risk set for acquisition and vice versa.

The hazard rates for dissolution, acquisition, and termination in total are defined as follows. The hazard rate for termination is equal to the sum of the hazard rates for dissolution and acquisition.

Dissolution: $$h_{iD}(t) = \lim_{\Delta t \to 0} \frac{P(t < T_i \leq t + \Delta t, D = d \mid T_i > t)}{\Delta t}$$

Acquisition: $$h_{iA}(t) = \lim_{\Delta t \to 0} \frac{P(t < T_i \leq t + \Delta t, A = a \mid T_i > t)}{\Delta t}$$

Termination: $$h_{iT}(t) = \lim_{\Delta t \to 0} \frac{P(t < T_i \leq t + \Delta t, T = a \mid T_i > t)}{\Delta t}$$

$$h_i(t) = h_{iD}(t) + h_{iA}(t)$$

Among different types of EHA models, semiparametric Cox models are chosen for this study. Semiparametric Cox models are more suitable than parametric models for this study because it is difficult to make a reasonable assumption of the baseline hazard function for JV dissolution and acquisition, and unrealistic assumption of the baseline form introduces bias to the analysis. Semiparametric models can avoid bias by leaving the baseline hazard function form unspecified, and still be able to estimate the effects of covariates (Box-Steffensmeier 2004; Therneau 2000). Moreover, Cox models can readily incorporate time-dependent covariates, which is essential in this study that emphasizes change over time (Allison 1995; Box-Steffensmeier 2004; Therneau 2000).

After estimating the Cox models for JV dissolution and acquisition, for the purpose of comparison, a model for the event of termination in total is estimated. The formulations of Cox models for dissolution, acquisition and termination in total are listed below. Same covariates are included in the three models. In the following equations, the covariates $x_{ij}(t)$ are time dependent covariates.

Dissolution:

$$h_{iD}(t) = \lambda_{0D}(t)\exp\left\{\beta_{1D}x_{i1}(t) + \beta_{2D}x_{i2}(t) + ... + \beta_{jD}x_{ij}(t) + ... + \beta_{kD}x_{ik}(t)\right\}$$

$$\log h_{iD}(t) = \log \lambda_{0D}(t) + \beta_{1D}x_{i1}(t) + \beta_{2D}x_{i2}(t) + ... + \beta_{jD}x_{ij}(t) + ... + \beta_{kD}x_{ik}(t)$$

Acquisition:

$$h_{iA}(t) = \lambda_{0A}(t)\exp\left\{\beta_{1A}x_{i1}(t) + \beta_{2A}x_{i2}(t) + ... + \beta_{jA}x_{ij}(t) + ... + \beta_{kA}x_{ik}(t)\right\}$$

$$\log h_{iA}(t) = \log \lambda_{0A}(t) + \beta_{1A}x_{i1}(t) + \beta_{2A}x_{i2}(t) + ... + \beta_{jA}x_{ij}(t) + ... + \beta_{kA}x_{ik}(t)$$

Termination:

$$h_{iT}(t) = \lambda_{0T}(t)\exp\left\{\beta_{1T}x_{i1}(t) + \beta_{2T}x_{i2}(t) + ... + \beta_{jT}x_{ij}(t) + ... + \beta_{kT}x_{ik}(t)\right\}$$

$$\log h_{iT}(t) = \log \lambda_{0T}(t) + \beta_{1T}x_{i1}(t) + \beta_{2T}x_{i2}(t) + ... + \beta_{jT}x_{ij}(t) + ... + \beta_{kT}x_{ik}(t)$$

4.2. Data

4.2.1. Sample

Joint ventures were selected from Thomson Financial SDC Platinum database. The study selected manufacturing, marketing, and R&D joint ventures located in US and formed during the time period from 1990 to 2001, leaving 3 years between the formation time and the time when observation was ended (2004), considering the average life span of joint ventures is 3-4 years (Harrigan 1988). Twelve major manufacturing industries were included, specifically, chemical and allied products, drugs, electronic and electrical equipment, communication equipment, food and kindred products, computer and office equipment, machinery, transportation equipment, paper and allied products, soaps, cosmetics, and personal-care products, rubber and miscellaneous plastic products, metal and metal products. To be able to obtain financial data of parent companies and to contact parent companies, the sample was further restricted to joint ventures with at least one US public company as parent.

This resulted in 925 joint ventures. Matching these joint ventures with the Dun & Bradstreet (D&B) database resulted in 465 joint ventures with JV sales information. Each of these joint ventures was then tracked to see whether it was terminated or still in operation at the end of 2004. Among these 465 joint ventures, information on termination was obtained for 255 joint ventures, including whether it is terminated or not, and the time and type of termination if terminated.

Missing values of the covariates reduced the final sample for analysis to 150, among which 89 joint ventures were terminated, including 13 dissolutions and 76 acquisitions. This resulted in a termination rate of 8.67% for dissolution and 50.67% for acquisition, and a total termination rate of 59.33%.

To test for sampling bias, sales, net worth and gross profit of joint ventures in the final sample were compared with those of joint ventures that missed covariate values, and with those of joint ventures that missed JV termination information. T tests were conducted for each year from 1990 to 2001. For most years, t tests did not show significant difference between the final sample and excluded cases due to missing values.

4.2.2. Data collection method

The core data needed for the study include: the time of joint venture formation (i.e., when the contract was completed); whether the joint venture had been terminated at the end of the data period; if it had been terminated, the time of termination (i.e., when the contract was terminated); and how it was terminated (i.e., dissolution, or acquired by a parent firm). These data were gathered from Thomson Financial SDC Platinum database, and validated through Corporate Affiliations and Factiva. For those joint ventures that still miss this information, the parent companies

were contacted. The contact was done through email and telephone. Emails were first sent to the investor relations contact of the parent companies, asking for cooperation and identifying the person with knowledge of the joint venture. Multiple telephone follow-ups were made to obtain the information. Other potential sources were also utilized as complementary means of identifying the person involved in the joint venture.

To build time-dependent covariates, the values of the covariates are needed from the year when a joint venture was formed until it was terminated or until the end of observation period, which is the end of year 2004. Time series data of covariates were collected from various secondary sources, including bureau of census, Compustat, Corporate Affiliations, Delphion, and Dun & Bradstreet. The operationalization of the covariates and their data sources are presented in the following section.

4.3. Measures

Table 3 listed the measures of the covariates in this study and the corresponding data sources.

Market growth

Market growth is measured with the annual growth rate of value of shipments for different industries at 4-digit SIC level (Kogut 1991; Kogut 1989). Data were obtained from Bureau of Census Annual survey of manufacturers. To create time series data, for the years after 1997, when NAICS system was used instead of the SIC, NAICS codes were converted to SIC codes according the matching table provided by NAICS.

Table 3. Variables, measures and data sources

Variables		Measures	Data sources
Changes in market competition			
Market growth		Annual growth rate of value of shipments	Bureau of census
Increase in market concentration		Market concentration ratio increase	Bureau of census
Changes in partner firm overall investment strategy			
Product line shift		Change of parent firm primary SIC code	Compustat
Increase in parent firm resources	Manufacturing resources	Capital expenditure	Compustat
	Marketing resources	Marketing expenditure	Compustat
	R&D resources	R&D expenditure	Compustat
Disruptive event		Parent firm merged with or acquired by others	Compustat
Changes in partner firm overall governance strategy			
Increase in risk of appropriation		Increase in patent correlation	Delphion
Decrease in alternative partners		Formation of partnerships involving same activities by firms in the partner's industry	Thompson Financial SDC Platinum
Formation of competing partnerships		Formation of similar partnerships by the focal parent	Thompson Financial SDC Platinum
JV performance			
JV sales Performance		JV sales	Dun & Bradstreet
JV type			
Related vs. unrelated JV		Parent and JV same SIC codes	Thompson Financial SDC Platinum
Direct-competitor JV vs. Non-direct-competitor JV		Two parents same SIC codes	Thompson Financial SDC Platinum

Increase in market concentration

Market concentration is measured with the percentage of value of shipments accounted for by the top 50 companies in an industry at 4-digit SIC code level. The Economic Census published by Bureau of Census provides market concentration data for manufacturers. Economic Census is published every five years. So for years that this information is not available, the closest available year's information is applied. This is consistent with the study by Kogut (1991; 1989). Increase in market concentration is calculated by subtracting the value of market concentration ratio at time t-1 from the value at time t.

Product line shift

Product line shift is measured with change in parent firms' primary SIC codes at 4-digit level. At each time point, if there is a change in the parent firm's primary SIC code, product line shift is coded as 1, and 0 otherwise. Because substantial time is needed for companies to adjust their lines of business, the carryover effects of product line shift are considered by using a Koyck-lag structure (Dutta et al. 1999). Formally, product line shift (PLS) for time t is defined as $\mathrm{PLS}_t = \sum_{k=1}^{k=t} \gamma^{t-k} \times PLS_k$. Here γ represents the weight attached to past values of product line shift. Primary SIC codes of the parent companies in each year are obtained from Compustat database.

Increase in parent firm resources

Three types of resources, manufacturing resources, marketing resources and R&D resources, are measured respectively by capital expenditure, sales, general and administrative expenses, and R&D expenditure of the parent firms (Dutta et al. 1999; Kogut 1991; Kogut 1989). Although sales, general and administrative expenses also

includes items that are in the domain of marketing, it has been used as to measure marketing resources in the literature and found to be a good proxy for the resources firms spend on their market research, sales efforts, and other related activities (Dutta et al. 1999). Increase in parent firm resource is calculated by subtracting the value of parent resources at time *t*-1 from the value at time *t*. Yearly data on capital expenditure, sales, general and administrative expenses, and R&D expenditure were obtained from Compustat.

Disruptive event

For disruptive event, this study considers when a parent firm is merged with or acquired by another firm. At each time point, the variable is coded as 1 if there is a M&A event for the parent, and 0 otherwise. This information was obtained form Compustat event database. Because substantial time is needed for the adjustment after M&A events, the carryover effects of disruptive events are considered by using a Koyck-lag structure (Dutta et al. 1999).

Increase in risk of appropriation

Risk of appropriation is measured by the correlation between the patent structures of different parents. Patent correlation has been used to measure of potential of technology spillover (Jaffe 1986). The distribution of a firm's patents over patent classes is used to characterize the technology position of the firm. A vector is constructed for each parent firm at each time point, with each element of the vector being the number of patents published in a certain class. The length of the vector therefore is the number of patent classes in the classification system. International patent classification (IPC) code is used, and the 3-digit class level is

adopted in the analysis, which results in altogether 129 classes. The correlation between the two vectors of the two parents represents how close their technology structures are, and the closer they are, the higher chance of technology spillover, which is related to a higher risk of appropriation. Increase in risk of appropriation is calculated by subtracting the value of risk of appropriation at time t-1 from the value at time t. Patent information was obtained from Delphion.

Decrease in alternative partners

Alternative partners should be firms that can provide similar needs as the current partner. Therefore when firms in the same industry as the current partner form joint ventures that carry out the same type of activity in the same industry as the focal joint venture, the number of alternative partners for the focal parent decreases. From Thompson Financial SDC Platinum, all the joint ventures formed in the current partner's industry were gathered and compared with the focal joint venture. Joint ventures that are in the same industry as the focal joint venture and are involved in the same type of activities, whether it is manufacturing, marketing or R&D, were selected. Considering the possible general trend of JV formation in an industry, the ratio of the number of selected joint venture formations to the total number of joint venture formations was used as the measure for decrease in alternative partners. Because of the time needed for companies to switch partners, the carryover effects of decrease in alternative partners are considered by using a Koyck-lag structure (Dutta et al. 1999).

Formation of competing partnerships

From Thompson Financial SDC Platinum, all other partnerships formed by the focal parent were gathered, and those in the same industry as the focal joint venture were selected as competing partnerships. Considering the possible general trend of JV formation of a company, the ratio of the number of competing JV formations to the total number of JV formations by the focal parent is used as the measure for formation of competing partnerships. Same as before, because substantial time is needed for companies to switch partners, the carryover effects of formation of competing partnership are considered by using a Koyck-lag structure(Dutta et al. 1999).

JV sales performance

Joint venture sales are used to measure the JV performance. This data were obtained from D&B.

Related JV

Related versus unrelated JVs are determined by comparing the 2-digit primary SIC codes of a joint venture and its parent. It is coded as one if they are the same, and 0 otherwise (Li 1995; Lu and Xu 2006).

Direct-competitor JV

Whether a joint venture is between director competitors is determined by comparing the 2-digit primary SIC codes of the two parents. It is coded as one if they are the same, and 0 otherwise (Park and Russo 1996; Park and Ungson 1997).

Due to the nature of the analysis, for some covariates for parent firm strategy, only one parent can be selected. Among different parents of a joint venture, public firms are chosen over private firms to ensure the availability financial information.

Then parents with a higher ownership are chosen over parents with lower ownership, as this study looks at the influence of parent strategy on joint ventures and dominant parents are more likely to be able to influence the joint venture. When two parent firms have equal ownership, one parent firm is randomly chosen.

Table 4 presents the descriptive statistics of the covariates.

Table 4. Mean, standard deviation, and correlations of covariates

	Mean	Standard Deviation	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Market growth	4.73	5.96	1												
2. Increase in market concentration	1.38	18.72	**0.151	1											
3. Product line shift	0.02	0.10	**-0.027	-0.015	1										
4. Increase in manufacturing resources	3.38	18.25	**0.043	-0.014	-0.001	1									
5. Increase in marketing resources	4.79	56.42	0.010	-0.002	0.006	**0.140	1								
6. Increase in R&D resources	3.78	43.44	**-0.087	-0.001	**0.035	**0.023	-0.017	1							
7. Disruptive event	0.01	0.06	*-0.021	-0.001	**0.003	-0.004	**-0.038	-0.007	1						
8. Increase in risk of appropriation	0.03	1.20	0.007	-0.002	-0.002	0.003	0.002	-0.004	0.003	1					
9. Decrease in alternative partners	38.00	85.29	**0.126	*-0.01	-0.020	**0.253	*0.171	**-0.023	-0.004	-0.009	1				
10. Formation of competing partnerships	12.41	43.42	**0.110	**-0.026	*-0.023	**0.154	**0.147	**0.037	-0.004	-0.001	**0.375	1			
11. JV Sales performance	16.64	38.72	**0.137	**0.089	0.003	**0.063	**0.030	**-0.028	-0.011	0.002	**0.068	**0.088	1		
12. Related JV	0.48	0.50	**0.048	**-0.083	**-0.026	*0.018	**0.067	**-0.058	0.014	0.004	**0.255	**0.161	**0.154	1	
13. Direct-competitor JV	0.41	0.49	-0.006	**-0.067	*-0.019	**0.084	**-0.044	**-0.046	**0.026	0.006	**0.295	**0.077	**0.107	**0.426	1

* Correlation significant at 0.05 level.
** Correlation significant at 0.01 level.
N = Number of joint ventures * Month = 18669.

CHAPTER 5

ANALYSIS RESULTS AND DISCUSSION

To examine the effects of covariates, which are changes, the level of these variables are included as control when possible. While changes are the differences of values between two time points, levels are the values at a certain point of time. After controlling for the effect of level variables, change variables are expected to have a distinct effect on the dependent variable. The level variables controlled for are market concentration, parent firm resource, and risk of appropriation.

To consider the moderating effects of JV type variables (interaction effects), the main effects of the two JV type variables, i.e., related versus unrelated JV, and direct-competitor JV and non-direct competitor JV, are also included. To investigate the interaction of JV type variables with the other covariates, the interactions of JV type variables and the levels of the covariates are also included. Other control variables included in the analysis are parent size, parent diversification level, and number of companies in the JV industry.

5.1. Statistical results

A model without the interaction effects of JV type variables was estimated first, and then interaction effects were included in a full model. SAS 9.1 was used for the statistical analysis. The effects of covariates on the hazard rates were estimated with partial likelihood estimation, and Breslow's approximation method was used to deal with event time ties. Table 5 presents the test results of the Cox models on JV dissolution and acquisition when interaction was not considered. Table 6 presents the test results of the Cox models on JV dissolution and acquisition when interaction was

included. The χ^2 statistics of the models are highly significant (p<0.001), indicating good overall fit of the models to data.

Table 5. Analysis results for the model without interaction effects.

Variables	Hs	Hypothesized relationships		Dissolution (D)		Acquisition (A)	
		D	A	Coef.	p value	Coef.	p value
Change in market competition							
Market growth	H1	-	+	-0.010	0.89	-0.027	0.30
Increase in market concentration	H2	+	+	-0.001	0.97	-0.012	0.17
Change in parent firm overall investment strategy							
Product line shift	H3	+	+	***3.826**	**0.01**	***1.328**	**0.09**
Increase in parent firm:							
Manufacturing (manu.) resources	H4	-	-	-0.006	0.90	***-0.050**	**0.01**
Marketing (mkt.) resources	H5	-	-	-0.007	0.59	***-0.011**	**0.02**
R&D resources	H6	-	-	0.001	0.87	0.002	0.23
R&D vs. manu. resources	H7	R&D < Manu		χ^2=0.02, p =0.88		χ^2=6.27, p =0.01	
R&D vs. Mkt. resources		R&D< Mkt		χ^2=0.30, p =0.58		χ^2=7.12, p =0.007	
Disruptive event	H8	+	+	***6.686**	**0.04**	***3.016**	**<0.01**
Change in parent firm overall governance strategy							
Increase in risk of appropriation	H9	+	+	-0.083	0.84	-0.117	0.51
Decrease in alternative partners	H10	-	-	***-0.027**	**0.08**	-0.001	0.63
Formation of competing partnerships	H11	+	+	***0.011**	**0.04**	0.002	0.45
Joint venture performance							
JV Sales performance	H12	-	+	-0.024	0.22	***-0.013**	**0.02**
Control variables							
Level variables							
Market concentration				-0.010	0.54	***0.018**	**0.04**
Parent diversification level				-0.015	0.94	***-0.149**	**0.04**
Parent manufacturing resources				0.002	0.84	0.001	0.70
Parent marketing resources				0.002	0.59	0.0001	0.91
Parent R&D resources				0.005	0.69	0.002	0.75
Risk of appropriation				-0.006	0.66	***-0.011**	**0.02**
Other control variables							
Direct-competitor JV				-0.452	0.60	0.037	0.90
Related JV				0.464	0.54	-0.174	0.55
Parent size				-31.855	0.61	-1.564	0.88
Number of companies in the JV industry				-0.639	0.12	0.101	0.33
Model χ^2				72.28 (df=21, p<0.001)		74.42 (df=21, p<0.001)	

Note: 1. Unstandardized coefficients are reported.

2. Positive coefficients indicate an independent variable has a positive effect on the hazard rate.

Table 6. Analysis results for the model with interaction effects

Variables	Hs	Hypothesized relationships		Dissolution (D)		Acquisition (A)	
		D	A	Coef.	*p* value	Coef.	*p* value
Change in market competition							
Market growth	H1	-	+	-0.035	0.69	-0.027	0.32
Increase in market concentration	H2	+	+	0.006	0.83	-0.011	0.21
Change in parent firm overall investment strategy							
Product line shift	H3	+	+	***4.883**	**0.03**	***2.631**	**<0.01**
Increase in parent firm:							
Manufacturing resources	H4	-	-	-0.033	0.73	***-0.053**	**0.06**
Marketing resources	H5	-	-	-0.043	0.18	***-0.015**	**0.03**
R&D resources	H6	-	-	-0.033	0.56	0.001	0.33
R&D vs. manu. resources	H7	R&D < Manu		χ^2=0.0001, *p* =0.99		**χ^2=3.67, *p* =0.01**	
R&D vs. Mkt. resources		R&D< Mkt		χ^2=0.26, *p* =0.87		**χ^2=5.46, *p* =0.05**	
Disruptive event	H8	+	+	***7.321**	**0.06**	***6.660**	**0.01**
Change in parent firm overall governance strategy							
Increase in risk of appropriation	H9	+	+	-0.062	0.85	-0.132	0.54
Decrease in alternative partners	H10	-	-	-0.043	0.12	-0.006	0.14
Formation of competing partnerships	H11	+	+	***0.015**	**0.07**	0.003	0.42
Joint venture performance							
JV Sales performance	H12	-	+	***-0.056**	**0.04**	***-0.011**	**0.07**
Interaction of related JV with change in investment strategy variables							
Related JV * Product line shift	H13	-	-	0.001	0.80	-25.122	0.53
Related JV * Increase in manufacturing resources	H14	-	-	-0.209	0.29	-0.032	0.64
Related JV * Increase in marketing resources	H15	-	-	***0.207**	**0.06**	0.017	0.29
Related JV * Increase in R&D resources	H16	-	-	***0.210**	**0.03**	-0.012	0.50
Related JV * Disruptive event	H17	-	-	---	---	-3.710	0.19
Interaction of direct-competitor JV with change in governance strategy variables							
Direct-competitor JV * Increase in risk of appropriation	H18	+	+	-0.129	0.92	0.011	0.98
Direct-competitor JV * Decrease in number of alternative partners	H19	+	+	0.012	0.51	***0.005**	**0.06**
Direct-competitor JV * Formation of competing partnerships	H20	+	+	0.008	0.66	-0.007	0.24
Control variables							
Level variables							
Market concentration				-0.004	0.83	***0.019**	**0.04**
Parent diversification level				-0.020	0.36	***-0.285**	**<0.01**
Parent manufacturing resources				0.004	0.50	0.002	0.68
Parent marketing resources				0.017	0.57	0.0001	0.85
Parent R&D resources				-0.053	0.83	0.003	0.75
Risk of appropriation				0.0001	0.99	***-0.012**	**0.09**

Interaction of level variables							
Related JV * Manufacturing resources				0.034	0.14	-0.006	0.39
Related JV * marketing resources				0.010	0.39	***0.007**	**0.05**
Related JV * R&D resources				***-0.088**	**0.05**	-0.011	0.40
Direct-competitor JV * risk of appropriation				-0.010	0.78	-0.015	0.17
Other control variables							
Direct-competitor JV				-0.525	0.70	0.011	0.98
Related JV				-1.244	0.31	-0.321	0.38
Parent size				-33.940	0.66	-5.127	0.81
Number of companies in the JV industry				***-0.971**	**0.07**	0.054	0.64
Model χ^2				79.00 (df=32, p<0.001)		108.99 (df=33, p<0.001)	

Note: 1. Unstandardized coefficients are reported.

2. Positive coefficients indicate that an independent variable has a positive effect on the hazard rates.

3. The interaction between related JV and disruptive event is not tested for dissolution due to 0 degree of freedom.

5.1.1. Change in market competition

The effects of market growth on the propensity of JV dissolution (β = -0.010, p =0.89) and acquisition (β = -0.027, p =0.30) are both not significant. The non-significance does not change when interaction effects are considered. H1a and H1b are not supported.

The effects of increase in market concentration on the propensity of JV dissolution (β =-0.001, p =0.97) and acquisition (β =-0.012, p =0.17) are both not significant. The non-significance does not change when interaction effects are considered. H2a and H2b are not supported.

5.1.2. Change in parent firm overall investment strategy

Parent product line is found to have significant positive effects on both dissolution and acquisition. In the model without interaction, the coefficient estimates are 3.826 (p=0.01) for dissolution and 1.328 (p=0.09) for acquisition. In the model

with interaction, the coefficient estimates are 4.883 (p=0.03) for dissolution and 2.631 (p<0.01) for acquisition. Therefore H3a and H3b are both supported.

Increase in parent manufacturing resources does not show any significant effect for dissolution, but it shows a significant negative effect on the propensity of acquisition (β =-0.050, p =0.01 in the model without interaction and β =-0.053, p =0.06 when interaction is included). H4a is not supported, but H4b is supported. Similarly, increase in parent marketing resources does not show any significant effect for dissolution, but it shows a significant negative effect the propensity of acquisition (β =-0.011, p =0.02 in the model without interaction and β = -0.015, p =0.03 when interaction is included). Therefore H5a is not supported, but H5b is supported. Increase in parent R&D resources does not show any significant effects on both dissolution and acquisition. H6 are not supported. In general influences of increase in parent firm resources are partly supported for acquisition but not for dissolution.

To test for H7, the coefficient estimates for increase in parent firm R&D resources were compared with those for increase in parent firm manufacturing and marketing resources. Wald tests were conducted to compare the estimates. For JV dissolution, all three types of resources did not show significant effects, and the effect of R&D resources was not significantly different from those of manufacturing and marketing resources. When the model was tested without interaction, the comparison with manufacturing resources yielded a χ^2 of 0.02 (p =0.88); the comparison with marketing resources yielded a χ^2 of 0.30 (p =0.58). In the model with interactions included, the comparison with manufacturing resources yielded a χ^2 of 0.0001 (p =0.99); comparison with marketing resources yielded a χ^2 of 0.026 (p =0.87). H7a is not supported. For JV acquisition, the effect of R&D resources is found to be significantly lower than those of manufacturing and marketing resources. When the

model was tested without interaction, the comparison with manufacturing resources yielded a χ^2 of 6.27 (p =0.01); the comparison with marketing resources yielded a χ^2 of 7.12 (p <0.01). In the model with interactions included, the comparison with manufacturing resources yielded a χ^2 of 3.67 (p =0.01); comparison with marketing resources yielded a χ^2 of 5.46 (p =0.05). H7b is supported.

The effects of disruptive event are found to be positive and significant. In the model without interaction effects, the coefficient estimates are 6.686 (p=0.04) for dissolution and 3.016 for acquisition (p<0.01). When interaction is considered, the coefficient estimates are 7.321 (p=0.06) for dissolution and 6.660 for acquisition (p=0.01). Therefore H8a and h8b are both supported.

5.1.3. Change in parent firm overall governance strategy

The effects of increase in risk of appropriation are not significant for both dissolution and acquisition. H9a and H9b are not supported.

Decrease in alternative partners is found to have a negative and significant effect on dissolution (β =-0.027, p =0.08) in the model without interaction. When interaction effects are included in the model, the effect turns non-significant with a p value of 0.12. Considering the small sample size for dissolution, H10a is generally supported. Decrease in alternative partners does not show significant effect on acquisition (β =-0.001, p =0.63 in the model without interaction and β =-0.006, p =0.14 when interaction is included). Therefore H10b is not supported.

A significant and positive effect is found for formation of competing partnerships on JV dissolution (β =0.011, p =0.04 in the model without interaction and β =0.015, p =0.07 when interaction is included). H11a is supported. Formation of competing partnerships does not show significant effect on acquisition (β =0.002, p

=0.45 in the model without interaction and β =0.003, p =0.42 when interaction is included). Therefore H11b is not supported.

5.1.4. JV performance

Even though JV sales performance did not show a significant effect on dissolution in the base model without interaction effects, it did show a significant negative effect (β =-0.056, p =0.04) on dissolution when interaction is considered. Therefore H12a is generally supported. JV sales performance shows a significant negative effect on JV acquisition (β =-0.013, p =0.02 in the model without interaction and β =-0.011, p =0.07 when interaction is included). Therefore H12b is generally supported.

5.1.5. The interaction effects with JV type variables

Among the interactions with the first JV type variable, related versus unrelated JV, increase in marketing resource and R&D resources show significant effects on dissolution, with the coefficient estimates being 0.207 (p=0.06) and 0.210 (p=0.03) respectively. All other interaction effects are not significant. The interaction effect of disruptive events and related versus unrelated JV is not tested because there is not enough degree of freedom due to small sample size. Therefore, H15a and H16a are supported, while H14, H15b and H16b are not supported. In total, the interaction effects of increase in parent firm resources and related JV are partly supported.

For interactions with the second JV type variable, JV between direct competitors, decrease in alternative partners showed a significant effect on JV acquisition (β =0.005 p =0.06). Therefore H19b is supported. Other interaction effects of direct-competitor JV and governance strategy change are not significant. H18,

H19a and H20 are not supported. In total, the interaction effects of direct-competitor JV and change in governance strategy variables are partly supported.

5.1.6. JV termination in total

For the purpose of comparison, the same Cox models for JV termination in total was also tested, where dissolution and acquisition are not distinguished from each other, but rather considered as the same event: JV termination. Table 7 and 8 present the comparison of test results for JV termination in total, and JV dissolution and acquisition. Table 7 is the results when interactions are not included; Table 8 is the results for models with interactions.

Table 7. Comparison of test results for JV termination in total and JV dissolution and acquisition: without interaction effects

Variables	Hs	Hypothesized relationships		Dissolution (D)		Acquisition (A)		Termination (T)	
		D	A	Coef.	*p* value	Coef.	*p* value	Coef.	*p* value
Change in market competition									
Market growth	H1	-	+	-0.010	0.89	-0.027	0.30	-0.024	0.31
Increase in market concentration	H2	+	+	-0.001	0.97	-0.012	0.17	-0.006	0.46
Change in parent firm overall investment strategy									
Product line shift	H3	+	+	***3.826**	**0.01**	***1.328**	**0.09**	***1.488**	**0.03**
Increase in parent firm:									
Manufacturing resources	H4	-	-	-0.006	0.90	***-0.050**	**0.01**	***-0.041**	**0.02**
Marketing resources	H5	-	-	-0.007	0.59	***-0.011**	**0.02**	***-0.010**	**0.01**
R&D resources	H6	-	-	0.001	0.87	0.002	0.23	0.002	0.23
R&D vs. manu. resources	H7	R&D < Manu		χ^2=0.02, *p* =0.88		**χ^2=6.27, *p* =0.01**		**χ^2=5.90, *p* =0.02**	
R&D vs. Mkt. resources		R&D< Mkt		χ^2=0.30, *p* =0.58		**χ^2=7.12, *p*<0.01**		**χ^2=7.71, *p* =0.01**	
Disruptive event	H8	+	+	***6.686**	**0.04**	***3.016**	**<0.01**	***3.449**	**<0.01**
Change in parent firm overall governance strategy									
Increase in risk of appropriation	H9	+	+	-0.083	0.84	-0.117	0.51	-0.113	0.47
Decrease in alternative partners	H10	-	-	***-0.027**	**0.08**	-0.001	0.63	-0.002	0.31
Formation of competing partnerships	H11	+	+	***0.011**	**0.04**	0.002	0.45	0.003	0.19
Joint venture performance									
JV Sales performance	H12	-	+	-0.024	0.22	***-0.013**	**0.02**	***-0.015**	**0.01**
Control variables									
Level variables									
Market concentration				-0.010	0.54	***0.018**	**0.04**	0.010	0.16
Parent diversification level				-0.015	0.94	***-0.149**	**0.04**	***-0.120**	**0.07**
Parent manu. resources				0.002	0.84	0.001	0.70	0.001	0.73
Parent mkt. resources				0.002	0.59	0.0001	0.91	0.0001	0.95
Parent R&D resources				0.005	0.69	0.002	0.75	0.003	0.49
Risk of appropriation				-0.006	0.66	***-0.011**	**0.02**	***-0.011**	**0.01**
Other control variables									
Direct-competitor JV				-0.452	0.60	0.037	0.90	0.042	0.88
Related JV				0.464	0.54	-0.174	0.55	-0.150	0.58
Parent size				-31.855	0.61	-1.564	0.88	-3.934	0.73
Number of companies in the JV industry				-0.639	0.12	0.101	0.33	0.014	0.89
Model χ^2				72.28 (df=21, *p*<0.001)		74.42 (df=21, *p*<0.001)		104.09 (df=21, *p*<0.001)	

Note: 1. Unstandardized coefficients are reported.
2. Positive coefficients indicate that an independent variable has a positive effect on the hazard rate.

Table 8. Comparison of test results for JV termination in total and JV dissolution and acquisition: with interaction effects

Variables	Hs	Hypothesized relationships		Dissolution (D)		Acquisition (A)		Termination (T)	
		D	A	Coef.	*p* value	Coef.	*p* value	Coef.	*p* value
Change in market competition									
Market growth	H1	-	+	-0.035	0.69	-0.027	0.32	-0.016	0.52
Increase in market concentration	H2	+	+	0.006	0.83	-0.011	0.21	-0.007	0.32
Change in parent firm overall investment strategy									
Product line shift	H3	+	+	***4.883**	**0.03**	***2.631**	**<0.01**	***2.562**	**<0.01**
Increase in parent firm:									
Manufacturing resources	H4	-	-	-0.033	0.73	***-0.053**	**0.06**	***-0.048**	**0.05**
Marketing resources	H5	-	-	-0.043	0.18	***-0.015**	**0.03**	***-0.014**	**0.02**
R&D resources	H6	-	-	-0.033	0.56	0.001	0.33	0.001	0.31
R&D vs. manu. resources	H7	R&D < Manu		χ^2=0.0001, *p* =0.99		**χ^2=3.67, *p* =0.01**		**χ^2=3.92, *p* =0.01**	
R&D vs. Mkt. resources		R&D< Mkt		χ^2=0.26, *p* =0.87		**χ^2=5.46, *p* =0.05**		**χ^2=6.07, *p* =0.05**	
Disruptive event	H8	+	+	***7.321**	**0.06**	***6.660**	**0.01**	***6.418**	**0.01**
Change in parent firm overall governance strategy									
Increase in risk of appropriation	H9	+	+	-0.062	0.85	-0.132	0.54	-0.116	0.51
Decrease in alternative partners	H10	-	-	-0.043	0.12	-0.006	0.14	***-0.008**	**0.04**
Formation of competing partnerships	H11	+	+	***0.015**	**0.07**	0.003	0.42	0.004	0.21
Joint venture performance									
JV Sales performance	H12	-	+	***-0.056**	**0.04**	***-0.011**	**0.07**	***-0.013**	**0.02**
Interaction of related JV with change in investment strategy variables									
Related JV * Product line shift	H13	-	-	0.001	0.80	-25.122	0.53	-0.003	0.18
Related JV * Increase in manufacturing resources	H14	-	-	-0.209	0.29	-0.032	0.64	-0.017	0.74
Related JV * Increase in marketing resources	H15	-	-	***0.207**	**0.06**	0.017	0.29	0.016	0.28
Related JV * Increase in R&D resources	H16	-	-	***0.210**	**0.03**	-0.012	0.50	-0.004	0.84
Related JV * Disruptive event	H17	-	-	---	---	-3.710	0.19	-2.893	0.26
Interaction of direct-competitor JV with change in governance strategy variables									
Direct-competitor JV * Increase in risk of appropriation	H18	+	+	-0.129	0.92	0.011	0.98	-0.035	0.92
Direct-competitor JV * Decrease in alternative partners	H19	+	+	0.012	0.51	***0.005**	**0.06**	***0.006**	**0.02**
Direct-competitor JV * Formation of competing partnerships	H20	+	+	0.008	0.66	-0.007	0.24	-0.008	0.13

Control variables									
Level variables									
Market concentration				-0.004	0.83	***0.019**	**0.04**	***0.013**	**0.08**
Parent diversification level				-0.020	0.36	***-0.285**	**<0.01**	***-0.256**	**<0.01**
Parent manu. resources				0.004	0.50	0.002	0.68	0.002	0.58
Parent mkt. resources				0.017	0.57	0.0001	0.85	0.0001	0.94
Parent R&D resources				-0.053	0.83	0.003	0.75	0.004	0.66
Risk of appropriation				0.0001	0.99	***-0.012**	**0.09**	***-0.011**	**0.07**
Interaction of level variables									
Related JV * Parent manu. Resources				0.034	0.14	-0.006	0.39	-0.002	0.62
Related JV * Parent mkt. resources				0.010	0.39	***0.007**	**0.05**	***0.006**	**0.04**
Related JV * Parent R&D resources				***-0.088**	**0.05**	-0.011	0.40	-0.012	0.32
Direct-competitor JV * Risk of appropriation				-0.010	0.78	-0.015	0.17	-0.015	0.16
Other control variables									
Direct-competitor JV				-0.525	0.70	0.011	0.98	0.013	0.97
Related JV				-1.244	0.31	-0.321	0.38	-0.501	0.13
Parent size				-33.940	0.66	-5.127	0.81	-9.993	0.58
Number of companies in the JV industry				***-0.971**	**0.07**	0.054	0.64	-0.028	0.78
Model χ^2				79.00 (df=32, p<0.001)		108.99 (df=33, p<0.001)		137.08 (df=33, p<0.001)	

Note: 1. Unstandardized coefficients are reported.

2. Positive coefficients indicate that an independent variable has a positive effect on the hazard rates.

3. The interaction between related JV and disruptive event is not tested for dissolution due to 0 degree of freedom.

A simple comparison of the significance of covariates in the three models (JV dissolution, JV acquisition and JV termination in total) shows that the testing results for JV termination in total is a lot more similar to those of JV acquisition than JV dissolution. The reason is acquisition accounts for a dominant proportion of JV termination. As shown in this sample, among all the joint ventures that were terminated, 86% were acquired by one of the parents and only 14% were dissolved. This further confirms the danger of not distinguishing between JV acquisition and JV dissolution.

5.2. Discussion of results

In general, JV performance and most external change variables were found to have significant influences on the propensity of JV dissolution and acquisition, and some effects differed for JV dissolution and acquisition. Some moderating effects of JV type on these effects were also found. The details are discussed below.

5.2.1. The influence of change in market competition

It is hypothesized that market growth decreases the propensity of JV dissolution but increases the propensity of JV acquisition. But the test results did not show significant influences of market growth on JV dissolution or acquisition. While market growth indicates increasing market potential and opportunities, it also increases new entries and competitive rivalry between firms (Kogut 1989). Increasing market potential raises the parent firm's evaluation of a joint venture, but increasing new entries and competitive rivalry have a negative influence on the parent firm's evaluation of the joint venture, because heated competition increases the difficulty for the joint venture to capture the increased market demand. How much a joint venture can contribute to the parent firm, which essentially determines the parent firm's evaluation of the joint venture, depends more on the actual competitive strategy and performance of the joint venture. Though market growth can help improve the performance of a joint venture, this effect has been captured by the JV performance covariate. Thus, market growth itself does not directly influence the propensity of JV dissolution or acquisition.

Increase in market concentration is hypothesized to be positively associated with the propensity of JV dissolution and acquisition, because increase in market concentration indicates increased market competition and the minimum scale needed

to participate in market competition. But the test results did not show significant influences of market growth on JV dissolution or acquisition.

Increase in market concentration ratio reflects changes in the general level of concentration in a market, but does not capture changes in the relative position of a joint venture in the market, which is more directly associated with the parent firm's reevaluation of the joint venture. For example, merger of two big firms in the JV industry will increase the concentration ratio. If the joint venture is a big firm that directly competes with these two firms, this has a substantial influence on its competitive position and consequently the parent firm's evaluation of the joint venture. But if the joint venture is significantly smaller and does not directly compete with these firms, this merger might not influence the joint venture as much. This is especially true for fragmented markets. Therefore without considering the relative position of a joint venture in the structure of competition, general change in the market concentration level does not influence the propensity of JV termination.

Considering specific events in market competition can help to capture changes of a joint venture's relative position in market competition. Events such as introduction of a new product by direct competitors or value chain expansion by direct competitors more accurately capture changes in market competition and its influence on the relative position of a joint venture in the market. Looking at the influences of these events would further our understanding of the co-evolutionary process and the influences of the market competition change on JV termination.

In sum, the test results indicate that changes in the general market environment, such as market growth and market concentration, do not have direct impact on the propensity of JV termination. Market growth is a measure of general market demand increase. Without considering the relative position of a joint venture

in the market, market concentration ratio is also a general measure of market competition. Changes in the general market environment may influence JV performance and the parent firm's strategic decisions, through which these changes have an indirect impact on JV termination. With a longitudinal study design that also incorporates JV performance and parent firm strategy as covariates, the indirect impact of market environmental change is captured by JV performance and parent firm strategy change, and it can be concluded that changes in the general market environment do not have a direct impact on JV termination. Market level factors do not have direct effects on JV termination when organizational level factors, such as parent firm strategy and JV performance, are considered.

5.2.2. The influence of change in parent firm overall investment strategy

Overall, change in parent firm overall investment strategy is found to have an impact on the propensity of JV dissolution and acquisition. Product line shift and disruptive event increase the propensity of both JV dissolution and acquisition. This supports the argument that parent firms' adjustment in business profiles changes their strategic focus and consequently the importance of a joint venture in the investment portfolio, which questions the existence of the joint venture. Disruptive events such as parent M&A also cause adjustments in the parent firms' overall strategy and operation, and therefore affect the existent of their joint ventures. This confirms that JV dissolution and acquisition are parent firms' adjustment actions to changes in the JV process, and joint ventures co-evolve with parent firm overall strategies.

Increase in parent firm manufacturing and marketing resources reduces the propensity of JV acquisition, while increase in parent R&D resources does not. The effect of increase in R&D resources is hypothesized to be weaker than manufacturing

and marketing resources because the complex and ambiguous nature of R&D resources makes it harder to transfer to the joint venture. The results indicate that the effect of R&D resource increase is not only weaker but also insignificant. This provides support to the complexity and ambiguity of R&D resources and its impact on resource sharing in a joint venture. In sum, the effects of increase in parent firm manufacturing, marketing and R&D resources confirms that, parent firm resources, though not directly invested in a joint venture, provides potentials for resource sharing and learning between parents, and an increase in these resources enhances parent firms' willingness to continue the JV partnership.

While increase in parent manufacturing and marketing resources shows significant effects on the propensity of JV acquisition, it does not significantly influence the propensity of JV dissolution. One of the differences between dissolution and acquisition is that dissolution involves substantial cost from liquidating of the joint venture, while acquisition does not involve such cost. Besides providing potentials for sharing, abundant parent firm resources enables the parent firm to afford the cost of dissolving a joint venture. Increase in parent firm resources not only reduces the propensity of JV dissolution by providing higher potential for resource sharing, but also makes dissolution more affordable, which counters the effects of increased resource sharing potential. Therefore, increase in parent firm resource does not significantly influence the propensity of JV dissolution. This indicates different effects of parent firm resources on JV dissolution and acquisition, and provides support to the differences between JV dissolution and acquisition.

5.2.3. The influence of change in parent firm overall governance strategy

Increase in risk of appropriation is hypothesized to positively influence the propensity of JV dissolution and acquisition. However the effect did not turn out to be significant. Three possible reasons can explain this result. First of all, measured with patent correlation between partners, risk of appropriation represents the potential of technology transfer between partners. While technology transfer can be a risk of leaking valuable technology to the partner, it also provides benefits to the partners through interfirm learning, which creates synergy and competitive advantage (Doz and Hamel 1998; Hamel 1991). In fact, interfirm learning is an important motivation for the formation of business partnerships (Doz and Hamel 1998). Both protection of technology and learning play important roles in the interaction between partners, and the risk of appropriation is related to both forces. Through protection of technology, risk of appropriation positively influence the propensity of JV termination, but the potential for interfirm learning imposes a negative influence on JV termination, because partner firms are more likely to continue the joint venture when there is higher potential of interfirm learning (Hamel 1991). Therefore considering the benefits of technology transfer may help clarify the effects of risk of appropriation on JV termination.

Secondly, the influence of risk of appropriation may also be related to the risk-taking characteristics of parent firms. The positive effect of risk of appropriation is based on the assumption of risk adverseness of firms. However, not all firms are equally risk adverse, and some of them may not be risk adverse. For firms that are more tolerant to risk, the effect of risk of appropriation is less or even does not exist.

Third, it is also important to note the parent firm's ability to learn about changes in risk of appropriation. When involved in JV partnerships, not all firms are

equally aware of the risk of appropriation. In the GM and Toyota partnership, while Toyota came to the partnership with the intention to learn about the America auto market, GM was not prepared to protect its valuable knowledge and competitive advantage (Doz and Hamel 1998). When a parent firm is not aware of potential risk of appropriation, its JV decisions are not influenced by this risk. When there is an increase in the risk of appropriation, only parent firms that are aware of this change will be able to adjust accordingly.

Decrease in the number of alternative partners reduces the propensity of JV dissolution, but it does not influence JV acquisition. Formation of competing partnerships by the parent firms increases the propensity of JV dissolution, but not acquisition. Both decrease in alternative partners and formation of competing partnerships influence the focal JV by changing the parent firm's dependence on the partnerships. They both provide substitutes for the focal JV partnership, and make it easier for the parent firm to switch to other partners. The result indicates changed level of dependence and possibility of switching partners affect the propensity of JV dissolution but not acquisition. While dissolution can be motivated by switching partners, acquisition is more related to parent firm's internalization decision of the JV activity. This provides support to the different mechanisms underlying JV dissolution and acquisition.

5.2.4. The influence of JV sales performance

As hypothesized, JV sales performance negatively influences the propensity of JV dissolution, which confirms parent firms are more likely to dissolve a low-performing joint venture. Different from the hypothesis, JV performance is found to be negatively related to the propensity of acquisition, indicating that a joint venture

that is not performing well is more likely to be acquired one of the parent firms. This shows the motivation of JV acquisition is not only to fully exploit benefits, but very often is to internalize and achieve more control (Buckley and Casson 1996). Poor performance lowers the parent firm's evaluation of the joint venture and motivates the parent firm to achieve more control over the joint venture to improve performance. During the JV process, low performance gives the parent firm a legitimized excuse to propose a more active role in JV governance (Yan and Gray 1994), and undesirable JV performance has been found to be a reason for JV instability and a stimulus to changes in JV governance form (Yan 1998; Yan and Gray 1994).

5.2.5. The moderating effects of JV type

Related JV

Among the hypothesized interaction effects of related JV, only the interaction between related JV and increases in marketing resources and R&D resources show significant positive effects on JV dissolution, though the main effects are not significant. This indicates that increase in these resources increases the propensity of dissolution for related JVs, but not for unrelated JVs. A possible explanation is, because a related JV operates in the same industry as the parent firm, it shares very similar resources as the parent firm, and this in a sense puts the joint venture into competition with the parent firm's own business for resources in the overall portfolio of investment. When the parent firm increases its own resources, these resources are utilized in the parent firm, not in the joint venture. Because the joint venture and the parent firms are in the same industry, given the same amount of available resources for this industry in the overall portfolio, increase in parent firm resources can indicate a shift of focus from the joint venture to the parent firm's internal business, or the

expansion of the parent firm's internal business that reduces the importance of the joint venture in the overall investment portfolio. Both of these changes will increase the possibility of the joint venture being dissolved.

The effects of other covariate with regard to change in investment strategy, including product line shift, increase in manufacturing resources and disruptive events, stay same for related and unrelated JVs. In general, the moderating effects of related JVs are found to be limited. Related diversifications are not always preferred by firms to unrelated diversification, and related JVs are not always given priority in parent firm's adjustment of investment strategy. When the parent firm is engaged in a major strategic adjustment, related business may be first to divest. This reminds us to rethink the role of product relatedness in JV termination and firms' investment strategies.

First, the role of product relatedness can be different depending on the specific content of strategic change. Compared to unrelated JVs, related JVs are more closely connected to the parent firm's primary business. During the adjustment of parent firm overall investment strategy, related JVs can be given the priority to continue because they are closer to the core business, but on the other hand, they are under more direct influence of the parent firm's strategy and therefore more likely to be terminated during strategic change. Which influences are stronger depends on the specific content of strategic adjustment. For example, during product consolidation to focus on the core business, related JVs are less likely to be terminated because of its importance to the core business. However, when the parent firm is involved in a quick expansion to a completely different market, a related JV may be more likely to terminate than an unrelated JV, because resources are prioritized toward the expansion of the unrelated business. Investigation of the influence of specific events

of change, such as product consolidation, diversified expansion, etc. would improve our understanding of the role relatedness in JV termination.

Secondly, relatedness is only one dimension that how a joint venture is connected to the parent's primary business. Besides relatedness, the relative position and importance of the JV business in the parent firm's overall investment portfolio are associated with other factors such as the size of the JV or customer base for the JV product. Firm's investment strategies are also becoming more complicated than just diversification and consolidation (Bergh 2001). Other factors such as the interaction between market demands of different products are also important consideration of product portfolio management, and also influence the parent firm's decision on the JV business.

Direct-competitor JV

No interaction effect between direct-competitor JV and parent governance strategy change is found except for decrease in alternative partners. Decrease in alternative partners increases the propensity of acquisition for direct-competitor JVs but not for non-direct-competitor JVs. This confirms the hypothesized effect that, because JV parents in the same industry have more substitutable resources, when the availability of alternative partners decreases, the parent firm has the flexibility of obtaining needed resources internally instead of becoming more dependent on the current partner. Therefore for a direct-competitor JV, when less alternative partners are available, the propensity of acquiring the joint venture is increased. This effect does not exist for no-direct competitor JV because when parent firms are not from the same industry and the resources they seek from the JV partner is less likely to be internally available.

In general, the moderating effects of direct-competitor JV are found to be limited. Governance strategy is an important consideration for both joint ventures between direct competitors and joint ventures that do not direct complete. Cooperation between competitors has become more and more common, and firms are ready to take the risk of working with competitors and are learning about cooperation in the presence of competition (Bleeke and Ernst 1993; Doz and Hamel 1998). This also indicates that looking at factors that are directly related to the joint venture and its parent firms' strategies can reveal more information joint ventures than a simple classification of direct-competitor JV versus non-direct-competitor JV.

5.2.6. A comparison of JV dissolution and acquisition

It is generally confirmed that antecedent factors have differentiated effects on JV dissolution and acquisition. One difference is that increase in parent firm resources influences the propensity of JV acquisition, but not dissolution. This can be explained with the high cost of dissolving a joint venture, which involves liquidating the JV asset. Firms lacking resources try to avoid dissolution by keeping their joint ventures in operation or terminating them through acquisitions, which does not involve high liquidation cost. Parent firm resources provide potential for resource sharing, which supports the continuity of a joint venture; on the other hand, they enable the parent firm to afford the cost of liquidating a joint venture. So increase in parent firm resources reduces the propensity of JV acquisition, but does not have an influence on the propensity of dissolution.

Another difference is, decrease in alternative partners and formation of competing partnerships influence the propensity of JV dissolution but not acquisition. This is due to the different governance strategy considerations for dissolution and

acquisition. Dissolution can be motivated by the intention of switching partners. Both decrease in the number of alternative partners and formation of competing partnerships change the possibility of partner switching and the dependence of the parent firm on the focal joint venture. Acquisition, however, is mainly an internalization decision (Buckley and Casson 1996), not motivated by switching partners, and therefore not influenced by decrease in the number alternative partners or formation of competing partnerships.

In sum, the test results show different underlying mechanisms for JV dissolution and acquisition. The comparison of analysis results for JV dissolution, acquisition and termination in total also reveals that due to the dominant proportion of acquisition in JV terminations, the results for JV termination in total is very similar to that of JV acquisition, but quite different from that of JV dissolution. Considering the differences between JV dissolution and acquisition, only looking at JV termination in total would very likely produce misleading results and inhibits our understanding of the reasons and implications for JV termination. This further highlights the danger not distinguishing and separately modeling JV dissolution and acquisition.

CHAPTER 6

CONCLUSION

6.1. Synthesis of significant findings

1. **External change is an important reason for JV termination.**

External change is found to be an important reason for JV termination. Although changes in the market environment did not show significant influences, changes in the parent firm's overall investment strategy and governance strategy significantly influences the propensity of JV termination. During the JV co-evolutionary process, changes in the parent firm's overall investment strategy and governance strategy induce the parent firm to reevaluate a joint venture and readjust its JV related decisions. With the effect of JV performance being considered, external change still showed significant influences on the propensity of JV termination, including dissolution and acquisition. This indicates that external change is an important reason for JV termination and requires more attention in JV research.

2. **JV termination due to external change is not necessarily failure.**

Based upon the first finding, this study confirms that external change and JV performance are two primary reasons for JV termination. While JV terminations due to low performance are related to failure, terminations caused by external change are not necessarily failures, but rather strategic adaptations.

3. **Change rather than initial formation condition causes JV termination.**

By including both level variables and change variables in a longitudinal model, and controlling for some initial formation condition variables such as parent JV type, parent diversification level, etc., this study shows that, while initial formation condition may influence the propensity of JV termination, change in the JV co-evolutionary process is a direct cause of JV terminations. JV termination is resultant

from changes in the process of JV co-evolution with the market environment and parent firm overall strategy.

4. **A joint venture is embedded in the parent firm's overall strategy, and JV termination can result from parent firm strategic adjustment.**

This study incorporated factors exogenous to a joint venture and showed the important influence of parent firm overall strategy on the outcome of a joint venture. Changes in the parent firm's overall investment strategy such as product line shift, resource increase and disruptive events, and changes in the parent firm's overall governance strategy such as decrease in alternative partners and formation of competing partnerships are found to have significant impacts on the propensity of JV termination, including both dissolution and acquisition. These findings demonstrated the embeddedness of joint ventures in their parent firms' overall strategies, and how joint ventures evolve together with parent firm overall strategies. It also supported the argument that exogenous factors play an important role in determining the outcome of a joint venture.

5. **General market environment changes such as market growth and market concentration increase do not have direct influences on the propensity of JV termination.**

This study shows that, while changes in the market environment influence the performance of joint venture and may induce parent firm to adjust their decisions regarding the joint venture, general market environment changes do not have direct influences on the propensity of JV termination. When organizational level factors, including joint venture performance and parent firm strategy, are considered, general market environment changes such as market growth and market concentration increase do not show significant influence on JV termination. This indicates that

organizational level factors play a more direct role than general market environmental factors. Faced with the same environmental changes, joint ventures that are able to implement effective competitive strategy and produce high performance survive.

6. **Different mechanisms underline JV dissolution and acquisition.**

This study found some different effects of the antecedent factors for JV dissolution and acquisition. This implies that dissolution and acquisition are grounded in different motivations of the parent firms and have different implications for the parent firm. Dissolution involves high cost from liquidating assets, while acquisition can avoid such cost. From the perspective of investment strategy, acquisition can be related to the parent firm's expansion, indicating increased resource commitment in the JV business, while dissolution is a divestment decision. From the perspective of governance strategy, dissolution can be motivated by the intention of switching partners; acquisition is an internalization decision to achieve more control over the venture. These differences further demonstrate the importance of separately examining and comparing these two types of terminations.

6.2. Contributions

6.2.1. Theoretical contribution

First of all, this study provides an empirical test of co-evolutionary theory of alliances and further co-evolutionary theory. The empirical tests of this theory have been limited to case studies. This study conducts a quantitative test of this theory in the context of JV termination with a longitudinal study design. It provides empirical support to the co-evolutionary process of joint ventures with their parent firms and the market environment, and demonstrates the influences of the co-evolutionary process

on the JV outcome. It contributes to both the co-evolutionary theory and the area of alliances and joint ventures.

Secondly, adopting a co-evolutionary theory view, this study brings a new perspective of external change to JV termination studies. While previous studies focused on JV initial formation conditions and factors under JV management control, this study demonstrates that external change is also an important reason for JV termination. Change, rather than initial formation conditions, is identified as a direct cause of JV termination. This not only addresses the need to study the JV management process, but also reveals the importance of taking an evolutionary view in looking JV termination.

The significant influence of external change on JV termination provides support to and extends the evolutionary cycle of reevaluation and readjustment in the JV process (Doz 1996). During the partnering process, parent firms reevaluate the operation and performance of a joint venture as well as the joint venture's contribution to the overall parent firm strategy, and make adjustments on the joint venture decisions, which may lead to termination of the joint venture. This study shows that the cycle of reevaluation and readjustment (Doz 1996) not only involves the specifications of the joint venture itself, but also concerns the relative position of the joint venture in the overall strategic portfolio of the parent firm. By including external changes in parent firm overall strategy and the market environment, this study extends our understanding of the reevaluation and readjustment cycle during the JV partnering process.

Thirdly, this study demonstrates the embeddedness of joint ventures in parent firm overall strategy and supports the co-evolution of joint ventures with parent firm strategies. The influence of parent firm overall strategy change on the propensity of

JV termination shows the importance of viewing joint ventures in their parent firms' overall strategy portfolio, which has been largely neglected in previous literature.

Further, this study develops a comprehensive model of JV termination that incorporates both JV performance and factors exogenous to a joint venture, including the market environment and parent firm overall strategy. The model integrates industry organization, diversification and governance literature, and has substantial explanatory power of JV termination.

In addition, based on the model, this study identifies two primary reasons for JV termination: external change and JV performance. While relating low JV performance to failure, it argues that terminations that are caused by external change is not necessarily failure, but rather strategic adaptations of the parent firm, which may not be a bad thing for the parent firm. This helps clarify the misconception of relating JV termination solely to failure.

Lastly, this study distinguishes between two types of JV termination: dissolution and acquisition. It simultaneously investigates JV dissolution and acquisition and identifies different effects of the antecedent factors, which has rarely been done in the literature. This reminds researchers to take into consideration of the different nature of dissolution and acquisition in JV termination studies.

6.2.2. Empirical contribution

This study empirically tests a longitudinal model of joint venture termination with time-dependent covariates, and finds various factors that significantly contribute to JV termination, such as parent product line shift, parent resources, parent disruptive events, decrease in alternative partners, formation of competing partnerships, etc. It is also verified the influence of JV performance on termination, which has been

assumed in the literature but rarely tested in a comprehensive model with the longitudinal study design. These findings contribute to our understanding of the reasons for JV termination.

In addition, this study finds that acquisition accounts for a large proportion (86% in this study) of JV termination, while dissolution is actually a very small proportion (14% in this study) of total terminations. Total JV termination rate found in this study is 59.33%, while acquisition rate is 50.67% and dissolution rate is only 8.67%. The previously found high termination rate (referred as failure rate in some studies) of joint ventures needs to be reevaluated. Because acquisition and dissolution have different implications for the parent firms, separately evaluating dissolution rate and acquisition rate is necessary. This will also contributes to our understanding of the actual failure rate of joint ventures.

6.2.3. Managerial implications

Failure studies provide different insights from success studies. Understanding the reasons for JV termination can help managers to anticipate and be prepared for terminations. Despite of the frequent occurrence of JV terminations, managers are often caught off guard by the termination and are ill prepared to cope with the tensions and uncertainties associated with the breakdown of the relationship (Peng and Shenkar 2002). Being able to anticipate possible terminations helps managers to be prepared and better manage terminations.

More importantly, this study emphasizes that termination is not necessarily a failure if it is caused by external changes. Terminating a joint venture that no longer fit into the overall strategy is a necessary adaptation action rather failure. Even further, being able to do so in time contributes to the overall welfare of the firm.

Therefore knowing termination is not necessary failure enables the transformation of JV management philosophy from avoiding termination to anticipating, preparing and even actively planning termination.

Such a proactive view in JV management reminds mangers to specify terms of termination upfront when a joint venture is formed. Most joint ventures are formed without detailed terms regarding possible terminations. Managers need to be comfortable to discuss termination at the formation stage, as these prespecified terms will greatly reduce the uncertainty and tension coming with unexpected termination.

6.3. Limitations and directions for future research

One limitation of this study is that only one parent of a joint venture is considered. This is largely due to the limited data availability. If future research could include both parents and investigate the interaction between parents during the JV process characterized by change, it would enrich our understanding of the co-evolutionary process of joint ventures with the parent firms, especially the mechanism through which parent firms' adaptation strategies interact with each other and therefore influence the outcome of a joint venture.

To fully explore the co-evolution of joint ventures with the parent firms, further studies can investigate the influences of joint ventures on parent firm strategy, for example, how unexpected termination of a joint venture influences parent firm strategy and performance. Some studies have been done on the value creation effects of JV acquisition (e.g. Kumar 2005) in finance and management literature, but comprehensive studies are still needed on the influence of JV termination on parent firm strategic adjustment, especially the shock and adjustment needed after an unexpected JV termination.

Further, under this framework, other factors on changes in parent firms overall strategy and the market competition can be investigated. Especially valuable would be variables that capture the specific position of a joint venture in the market competition, and the relative position of a joint venture in the parent firm's overall strategic portfolio. For example, market concentration increase may have different influences depending on the joint venture's competitive position in the market, but value chain expansion by direct competitors will directly increase competition intensity for the focal joint venture. Parent product line shift is the general adjustment of the whole product portfolio, but the event of introducing a new product in the same category as the JV product considers the relative position of the JV product in the parent firm's overall product portfolio, and captures the specific influence of parent firm strategy change on the focal joint venture. Compared to variables on general changes of parent firm strategy and market competition, these variables would be able to better capture the connection between the joint venture and its parent firm strategy or the market environment, and be able to provide valuable contribution to the influence of external change on JV termination.

Lastly, this study reveals the different motivations and implications for JV dissolution and acquisition. Further investigations on the different mechanisms underlying dissolution and acquisition, and firms' choices between dissolution and acquisition would be very interesting and helpful for the understanding of JV termination and failure. In addition, from a parent firm's perspective, selling off a joint venture and acquiring a joint venture may have different reasons and implications. Both these two situations are included in acquisition in this study. Separately investigating parent sell-off and parent acquisition would be interesting future research.

6.4. Conclusion

This study adopts a co-evolutionary theory view of joint ventures and investigates the influences of external change, including changes in parent firm overall strategy and in the market competition, on the propensity of JV termination. It develops and tests a model of JV termination that incorporates external change as well as JV performance as determinants of the propensity of JV termination.

This study emphasizes change, rather than initial JV formation conditions, as an important cause of JV termination, and employs a longitudinal study design examine the over time effects of the antecedent factors. Viewing a joint venture as evolving in accompaniment with parent firm overall strategy and the market environment, it demonstrates the embeddedness of joint ventures in parent firm overall strategy, and how JV termination can result from parent firm strategic adjustment. It also contributes to the literature by simultaneously examining and comparing the differences between two types of JV termination: dissolution and acquisition.

Based on the model, this dissertation study identifies two causes of JV termination: low JV performance and changes external to the joint venture. Termination due to low performance is directly associated with failure, whereas change-induced termination is a result of firm strategic adaptation.

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