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THE RELATION BETWEEN RELATEDNESS AMONG JOINT VENTURE PARTICIPANTS AND PARENT FIRMS' MARKET PERFORMANCE

By

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ABSTRACT

THE RELATION BETWEEN RELATEDNESS AMONG JOINT VENTURE PARTICIPANTS AND PARENT FIRMS' MARKET PERFORMANCE

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The present research investigates the relationship between two key variables: relatedness among joint venture participants and parent firms' market performance. The basic argument is that there is a positive relationship between relatedness among joint venture participants and parent firms' market performance. Relatedness was defined as similarities between firms in products or markets. Three types of relatedness among the participants of each joint venture were examined: relatedness between parents, relatedness between one parent and child, and relatedness between two parents and child. Firms' market performance was defined as performance valued by the capital market and was reflected by stockholder returns. Abnormal stockholder return--the deviation of observed return from expected return--was used to capture changes in firms' market performance.

The entire sample was composed of 209 firms that announced joint ventures in the Wall Street Journal during 1975-1987. The relationship between joint venture announcements and abnormal stock returns for the entire sample was first examined. Announcement period abnormal stock return for a portfolio of firms was derived, and a t test was performed

to check the significance of this return. The relationships between each type of relatedness among joint venture participants and parent firms' abnormal stock returns were analyzed next. Linear regression techniques were used in these analyses.

Results support the hypothesized relationships between (a) joint venture announcements and parent firms' abnormal stock returns, (b) one parent-child relatedness and parent firms' abnormal stock returns, and (c) two parents-child relatedness and parent firms' abnormal stock returns. The hypothesized relation between parent-parent relatedness and parent firms' abnormal stock returns was not supported. Implications of the empirical results for research and practice were discussed along with suggestions for future research.

DEDICATED TO MY PARENTS

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CHAPTER ONE

INTRODUCTION

Overview

How do joint ventures affect firms' performance? One view is that joint ventures lead to superior performance of parent firms. Parent firms enjoy superior performance because the joint venture allows for more efficient utilization of complementary resources (McConnell & Nantell, 1985). Superior performance also may be derived from the joint venture's ability to increase the market power of the parent firms (Pfeffer & Novak, 1976a).

A different view is that joint ventures lower parent firms' performance (Berg & Friedman, 1981). Parent firms may bear high costs when the joint venture penetrates into a new, unfamiliar product or market area. High costs in learning about the new product/market areas and in competing with established firms may not be adequately covered by the parent firms' future income streams. This will lead to lower performance of the parent firms.

This study proposes that joint ventures lead to differences in parent firms' performance because there are differences in relatedness among joint venture participants. The "relatedness" construct originated in diversification studies and has been used to explain the performance of firms involved in internal diversification or in

merger/acquisition. Relatedness has been defined as similarities between businesses in resources and skills used to manufacture products or to serve markets (Rumelt, 1974; Salter & Weinhold, 1979). Determination of relatedness between businesses has been based on similarities in products or markets (Rumelt, 1974; Palepu, 1985; Capon, Hulbert, Faley & Martin, 1988). Relatedness was found to be able to explain differences in firms' performance--both accounting-based performance (e.g., Rumelt, 1974; Bettis, 1981), including return on assets, and market-based performance (Singh & Montgomery, 1987; Shelton, 1988), including stockholder return. This study's premise is that relatedness can be applied to joint ventures; the basic argument in this study is that relation exists between relatedness among joint venture participants and parent firms' market performance. The higher the product/market relatedness between joint venture participants, i.e., between parent and child or between parents, the higher the expected market performance of the parent.

Parent firms that are more related to their child are expected to be better performers than parent firms less related to their child for several reasons. One reason is that high relatedness suggests that the parent firm can share with its child specialized resources and skills that are used specifically in production or marketing functions, such as production technology, plants, raw materials, sales force, distribution channels, and research and development (R&D) skills. Relatedness also suggests that the parent firm can share with its child general resources and skills that are not specifically tied to products or markets, such as financial resources, which can be easily shared across functions (Kitching, 1967; Lubatkin, 1984; Singh & Montgomery,

1987). High relatedness, therefore, may suggest to the capital market that the parent firm can lower its average cost through sharing both specialized and general resources with its child.

Conversely, low relatedness between parent and child may suggest to the capital market that the parent firm can share only general resources with the child and hence cannot lower its average cost much. A parent and child that have low relatedness may not be able to share resources and skills used specifically in production and marketing functions. For instance, these firms may not be able to share production technology, plants, sales force, distribution channels, or R & D skills. Low opportunity to share such specialized resources also suggests that the parent has to bear high startup costs. Startup costs include: (a) costs of investments in assets such as production technology, plants or raw materials (Ansoff, 1965); (b) learning costs, which occur because management cannot transfer skills in original product/market areas to new, unrelated product/market areas (Salter & Weinhold, 1979); and (c) entry costs, such as R & D costs, costs of switching buyers from the product of established firms to the child firm's product, or costs of persuading distribution channels to accept the child firm's product (Porter, 1980). Even though low relatedness suggests that the parent can share general resources such as financial resources with its child, the advantages associated with this sharing tend to be offset by high startup costs. This, then, leads to the expectation that the performance of parent firms that are more related to their child will be better than the performance of parent firms less related to their child.

Another type of relatedness in a joint venture is relatedness

between parents. This study expects that the higher the product/market relatedness between parents, the higher the market performance for these firms. High product relatedness between parent firms may suggest that these firms have access to their partners' production technology. Obtaining more information/knowledge about the production technology used by their partners, the related parents may be able to improve their technology. An opportunity to improve production technology and hence to lower average costs can lead to high market performance for the related parent firms. Similarly, high market relatedness between parent firms may lead to high performance for these firms. A joint venture formed by parent firms operating in similar markets may help strengthen the market positions of these firms (Harrigan, 1985), and this means that the firms can longer sustain their profit levels. Higher relatedness between parent firms, therefore, tends to lead to parents' higher performance than lower relatedness between parents.

Another type of relatedness that this study examines is relatedness between parents and child, that is, the relatedness between one parent and the child compared with the relatedness between the other parent in the venture and the child. The present study argues that high relatedness between one parent and child may lead not only to high market performance for that parent firm, but also to high market performance for the firm's partner that is unrelated to the child. High relatedness between one parent and the child suggests that the parent possesses some resources/skills that allow for the child to penetrate into related markets at low cost. This means that the partner firm of this parent can benefit from the parent's relatedness with the child because the partner does not have to bear high startup costs.

Therefore, compared among unrelated parent firms across joint ventures, the parent firms whose partners are more related to the child are expected to perform better than the parent firms whose partners are less related to the child.

The logic underlying this final expectation is consistent with that of the prior expectations. That is, higher relatedness leads to higher market performance for the parent firm. This final expectation only extends the logic to apply to the joint ventures where parent firms differ in their relatedness with the child. Greater differences between parents as such creates just like spillover in performance from one parent to the other parent in the venture.

To sum up, this study expects that, for a joint venture consisting of two parents, the market performance of a focal parent can be explained by: relatedness between the focal parent and the child, relatedness between parents, and differences between the focal parent and its partner in their relatedness with the child. Relatedness can be differentiated as more related and less related, based on similarities between the businesses in products or markets.

Key Variables

Relatedness among Joint Venture Participants

Joint venture involves the creation of a new organizational entity by two or more partner organizations (Bergman, 1962; Boyle, 1968). The partner organizations are called "parents", and the created joint venture is called "child" (Harrigan, 1985). Parent and child are participants in a joint venture. At least three participants, i.e., two parents and one child, are involved in a joint venture.

This study focuses on the capital market reactions to relatedness differences among joint venture participants when the joint ventures were first publicly announced. Public announcement of a joint venture generally provides some information about the businesses of parent firms and a child firm. This leads to a possibility that (a) relatedness among joint venture participants can be inferred from the joint venture announcement and (b) relatedness can be used by the capital market to determine the value of the joint venture for the parent firms.

Firms' Market Performance

Market-based performance is concerned with the market valuation of firms (Salter & Weinhold, 1979; Singh & Montgomery, 1987). An increase in a firm's market value indicates market expectation of an increase in the firm's future income stream (Rappaport, 1986). A firm's increase in market value may be reflected by an increased stock price (Salter & Weinhold, 1979; Singh & Montgomery, 1987). Market value created through joint ventures may, therefore, be reflected by an increase in stock prices approximating the joint venture announcement. Joint ventures that lead to an increase in the stock prices of parent firms beyond that required by investors mean value gains to stockholders of these firms.

Firms' market value was chosen as a dependent variable for several reasons. One reason is that a firm's market value is relevant to the concern of management, whose goal is to maximize stockholder value. An increase in a firm's market value reflects an expectation of increase in the future income stream and hence an increase in future

stockholder value (Woolridge & Snow, 1990). A firm's market value can, therefore, indicate the market expectation of the firm's long-term viability.

Second, market value is a typical dependent variable in an "event study" approach, the approach that has been used popularly in finance and accounting literature. The approach focuses on capturing market responses to seemingly interesting events. This approach has been borrowed by several strategic studies and used to examine the capital market responses to merger/acquisition announcements (e.g., Shelton, 1988; Seth, 1990) or joint venture announcements (Woolridge & Snow, 1990). Because the focus of this study is consistent with the event study approach, an investigation of a firm's market value hence seems appropriate.

Finally, the market value of joint ventures is available for measurement when the ventures are first announced. Early measurement of the market value of joint ventures may lessen the effects of other unrelated events. This advantage may not be obtained if the value of joint ventures is measured after implementation. For instance, it may take up to two or three years for a joint venture to generate an income stream. By that time, it may be more difficult to separate the effects of initiating the joint venture from other events that might have influenced the firms' performance.

Question of Interest

Previous studies on joint ventures found a positive relationship between joint ventures and firms' market performance. McConnell and Nantell (1985), for example, found that stockholders of parent firms

obtained significant value gains approximating the joint venture announcement. This empirical finding was consistent with that of Ravichandran (1986). Even though these two prior studies share similar empirical findings, they seem to have different assumptions. McConnell and Nantell (1985) presume that the capital market reaction to joint venture announcements is homogeneous, whereas Ravichandran (1986) assumes that the capital market reaction to joint venture announcements is not uniform across all joint ventures. Ravichandran (1986) found that the market reaction to joint venture announcements varied among joint ventures in competitive and concentrated industries.

This study also examines the relationships between joint ventures and firms' market performance. Based on the assumption that the capital market reaction to joint venture announcements is not homogeneous across joint ventures, the present study takes a different position from that of prior studies. This study argues that differences in the capital market reaction to joint venture announcements depend on relatedness among joint venture participants. And because the capital market reaction is assumed to be reflected by the parent firms' market performance, the question of interest in this study can be expressed as: "Is there a relationship between relatedness among joint venture participants and parent firms' market performance?". The purpose of this study is thus to test empirically the hypotheses relating to this question of interest.

Model

The basic model that depicts the focus of investigation in the present study can be simply shown as:

Relatedness ---------> Market Performance

Relatedness among firms involved in a joint venture is an independent variable; parent firms' market performance is a dependent variable. Even though the above model does not explicitly include potential confounding variables, this study controls for these variables. Several variables that might have confounding effects include: parent firm size (McConnell & Nantell, 1985), the concentration of the child industry (Ravichandran, 1986), the potential market impact of the parents, and specific regulated industries (McConnell & Nantell, 1985; Ravichandran, 1986).

Premises of the Study

Several premises in this study can be made explicit. First, not all joint ventures are homogeneous. Relatedness among participants in different joint ventures may vary. Relatedness between parent firms, for example, may differ across joint ventures. In a similar vein, relatedness between parent and child firms may differ across joint ventures. Plausible differences in the extent of relatedness across joint ventures lead to the conjecture of variations in capital market reaction to joint venture announcements.

Second, firms are viewed as a broad set of resources/skills (Penrose, 1959; Rubin, 1973). Joint venture is one means that allows for more effective allocation of resources/skills of parent firms. For example, the parent firms may utilize more efficiently their excess

resources/skills by contributing them to their child.

Finally, the capital market is assumed to act efficiently in the sense that stock prices adjust very rapidly to new information (Fama, Fisher, Jensen & Roll, 1969). This assumption also implies that stock prices are indicators of value of resources being allocated. Hence, an announcement of joint venture will be efficiently processed by the capital market in such a way that the stock values of the parent firms reflect how the market values the resource allocation associated with the joint venture. This assumption of capital market efficiency has been supported by several studies (e.g., Fama, 1976).

Significance of the Study

The present study is significant in several aspects. First, the study can provide additional empirical results regarding the effects of joint ventures on firms' performance. Though joint ventures have become more popular strategic activities, especially in the recent decade (Harrigan, 1985), the consequences of joint ventures on firms' performance are still ambiguous. Few previous studies have examined relationships between joint ventures and firms' market performance. Most of these prior studies implicitly assume that joint ventures have homogeneous effects on firms. This study, however, argues that not all joint ventures are homogeneous in their effects on firms because the extent of relatedness among joint venture participants may vary. The examination of this argument can thus offer insight into the nature of the relationships between joint ventures and firms' performance.

Second, this study applies the relatedness concept (Rumelt, 1974) in a slightly different way from that typically used in

merger/acquisition studies. With respect to a merger or an acquisition, only one type of relatedness--relatedness between acquiring and acquired firms--has been examined in its effects on the firms' performance. With respect to a joint venture, however, at least three types of relatedness may affect firms' performance. These relatedness types are: relatedness between one parent and child, relatedness between parents, and relatedness between both parents and child. Relatedness between both parents and child, in particular, has not been examined in prior studies. The investigation in the present study, therefore, can contribute to joint venture studies.

In terms of practical significance, the focus of this study on the relation between relatedness among joint venture participants and firms' stock returns seems relevant to management, whose goal is to maximize stockholder value. Maximization of stockholder value is significant for management for several reasons. One reason is that high stockholder value is a performance goal that extends beyond the stockholders' domain to the firm as a whole. For instance, high stock value may inhibit a proxy battle for control and can enable a firm to have access to cheap sources of additional capital or equity (Branch & Gale, 1983; Lubatkin & Shrieves, 1986; Rappaport, 1986). Other reasons that may explain management's high attention to stockholder returns are: large stock ownership by management, a tie between management compensation and stockholder returns, and management's concern for its reputation in managing stockholder returns.

Scope of the Study

This study focuses on domestic joint ventures that were publicly announced in the Wall Street Journal during the period 1975-1987. To be included in the sample, joint ventures had to meet several criteria. First, each joint venture was formed by only two parent firms. This criterion helps control for any confounding effects of varying numbers of parent firms being involved. Second, all parent firms were U.S. corporations. This criterion helps control for any international diversification effects of joint ventures on firms' performance. Third, at least one of the parent firms in each joint venture had to be traded on the New York Stock Exchange or American Stock Exchange, and the stock returns data had to be available in the Center for Research in Security Prices (CRSP) daily tape 100 days prior to the joint venture announcement and 20 days following the announcement.

This study determines the relatedness among joint venture participants based on similarities in products or markets of these firms. Though it is recognized that the relatedness definition also includes similarities in technology or R & D skills used, a stream of research has determined relatedness mainly by product or market similarities. These studies found that product/market relatedness was adequate to explain differences in firms' performance (Palepu, 1985; Capon et al., 1988).

Research Method Synopsis

An initial sample of joint ventures was composed of joint ventures that were first publicly announced in the Wall Street Journal during January 1975 to December 1987. The announcements in the Wall

Street Journal were used because they serve as a primary source for initial sample selection for research in the finance area (Thompson, Olsen & Dietrich, 1987). The index of joint venture announcements in the Wall Street Journal was obtained from the joint venture section in Predicasts Funk & Scott Index of Corporate Changes and in the Wall Street Journal Index. These two sources of data were used to complement each other.

The approach used to derive relatedness among joint venture participants, the independent variable in this study, mainly follows the approach used by Shelton (1988). A continuous measure of relatedness was derived, based on similarities in products/markets between business segments of firms. The approach used to estimate parents' abnormal stock returns, the dependent variable, follows that of McConnell and Nantell (1985), who employ the residual analysis technique (Fama, Fisher, Jensen & Roll, 1969).

The methods of analysis employed in this study are: a correlation analysis, linear regression analyses and multiple regression analyses. These analyses were used to detect relationships between or among variables included in this study. The multiple regression analysis also was used to control for the effects of potential confounding variables.

Order of Presentation

This dissertation contains five chapters. Chapter One mainly provides an overview for this study. Chapter Two reviews prior studies that have examined the relationship between joint ventures and firms' market performance. This is followed by theoretical arguments on the

relation between relatedness among joint venture participants and parent firms' market performance. The hypotheses based on these arguments are then proposed. Next, Chapter Three describes the methodology that is used in the empirical investigation. The chapter presents: conceptual definitions and measures of dependent, independent and potential confounding variables; a description of the sampling procedure; and the statistical methods for hypotheses testing. Chapter Four presents the results of an empirical investigation. Chapter Five, the final chapter, discusses the results in light of specific hypotheses, draws some implications, and makes suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW, THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESES

Background

Joint ventures have quite a long history in the United States. Early use of joint ventures dates back at least to the year 1880, when railroads used them for large-scale projects. Later, in the early 20th century, joint ventures were formed to pool risks in shipping, gold exploration and other undertakings (Harrigan, 1985). The formation of joint ventures within the United States has blossomed since the mid-1970s (Pfeffer & Novak, 1976a; Harrigan, 1985). Over the past decade, more than 7,000 U.S. firms have entered into joint ventures across a wide variety of industries, such as automobiles, communication services, computers, electronic components, engines and aerospace, medical products, pharmaceuticals, videotapes and videodiscs, financial services and others. Almost all kinds of firms--single-product firms, multiproduct firms, closely held firms, publicly held firms--have entered into joint ventures. Mergers & Acquisitions reported that billions of investment dollars were spent annually through joint ventures.

Value creation through joint ventures seems to account for the popularity of joint ventures. Sources of value creation include, among others, more efficient utilization of resources and skills due to the

sharing of these resources and skills (e.g., Kogut, 1988; McConnell & Nantell, 1985); sharing of costs or risks in large or risky projects (Pate, 1969; Pfeffer & Novak, 1976a); better access to new technology or special types of skills (Berg & Friedman, 1981; Kogut, 1988); and improvement in a firm's competitive positioning or a firm's power over other organizations in both local and global markets (Harrigan, 1985; Pfeffer & Novak, 1976a).

Because the present study examines the relationship between joint ventures and firms' market performance, this chapter begins with a review of literature that has addressed this issue. Then the theoretical link between relatedness among joint venture participants and firms' market performance is developed. Research hypotheses that are in accordance with this theoretical framework are then proposed. Potential confounding variables also are identified.

Literature Review

Earlier work on joint ventures has focused primarily on two areas: (a) motivations to form joint ventures (e.g., Pfeffer & Novak, 1976a, 1976b; Kogut, 1988) and (b) effects of joint ventures on industrial concentration or industrial returns (Berg & Friedman, 1981; Duncan, 1982). Only a few studies have examined the relationship between joint ventures and firms' performance. These studies come from the finance and strategy areas.

Studies in finance lend support to the notion of a relationship between joint ventures and firms' market performance. These studies report that stockholders of parent firms obtain positive abnormal stock returns or value gains around the time of a joint venture announcement.

McConnell and Nantell (1985), for example, found that joint venture announcements lead to significant value gains to stockholders of parent firms. Their sample includes 136 domestic joint ventures entered into by 210 companies over the period 1972-1979. Similarly, Ravichandran (1986) found that, on average, stockholders of 481 firms entering into domestic joint ventures during the period 1972-1983 earned significant value gains around the two-day announcement period. Ravichandran (1986) also found that the reaction of the capital market to joint venture announcements was not homogeneous across joint ventures. Firms that entered into joint ventures in concentrated industries earned statistically significant value gains, whereas firms that entered into joint ventures in competitive industries did not earn statistically significant value gains.

Within the strategy area, the findings by Koh and Sinha (1990) can be contrasted to those of Ravichandran (1986). Koh and Sinha (1990) examined the effects of 76 joint ventures announced during 1972-1985 in the "information technology sector", comprising electrical and electronic machinery, communication, computers, data processing, electronic imaging and others. Their findings suggest that the profitability of joint ventures to parent firms depends on industrial concentration. That is, when the industry is not highly concentrated, a joint venture is profitable to the parent firm because the increase in the parent's output associated with the venture is high compared with the reduction in industry price. When the industry is highly concentrated, however, the joint venture may not be profitable to the parent firm because the increase in the parent's output associated with the joint venture may be insufficient to compensate for the reduction in

price. Koh and Sinha's findings thus contrast those of Ravichandran.

Another variable besides industrial concentration has been used to explain variations in firms' performance. Harrigan (1985), for example, examines the effects of parent firms' asymmetries in relatedness on the performance of 895 ventures in 23 industries during the years 1974-1985. Relatedness between parent firms in products, markets, technology, competitive activities and buyer-seller activities, and relatedness between parent and venture firms in R & D, production, marketing activities and buyer-seller activities were considered. Ventures were defined as all business activities in which parent firms might cooperate, regardless of their ownership forms and status as separate organizational entities. Harrigan's (1985) results suggest that ventures were assessed as more successful when the parent firms were related to their ventures in products, markets and/or technology than when the parent firms were unrelated to their ventures.

Previous research also compared the relationship between joint venture and firms' performance to the relationship between other strategic investments and firms' performance. The study by Woolridge and Snow (1990) examines differences between stock market reaction to joint venture announcements and stock market reaction to other strategic investment announcements, including research and development projects, major capital expenditures, and diversification into new products and/or markets. Their sample includes 767 public announcements of strategic investments by 248 companies engaging in 102 industries. They found that the stock market favored announcements regarding joint ventures and R & D investment over those in capital expenditures and product/market diversification. The two-day announcement period cumulative abnormal

returns for joint venture and R & D investment were 0.80% and 1.13%, respectively, compared with the two-day announcement period abnormal returns for capital expenditure and product/market diversification of 0.36% and 0.69%, respectively.

Two conclusions can be drawn from the foregoing review of joint venture research in the finance and strategy areas. First, there are relationships between joint ventures and firms' performance, and, second, these relationships are not homogeneous across joint ventures. Two studies (Koh & Sinha, 1990; Ravichandran, 1986) that focus on the relationship between joint ventures and parent firms' performance argue that differences in the concentration of the child industry can explain these different relationships across joint ventures. One study (Harrigan, 1985), which focuses on the relationship between joint ventures and child firms' performance, indicates that perhaps differences in relatedness among joint venture participants can help explain different relationships across joint ventures.

Comparison of the Present Research to Earlier Work

The present study employs a slightly different approach from prior studies. This study argues that the relationship between joint ventures and parent firms' performance can be explained by the relatedness among joint venture participants. The present study, therefore, makes use of the relatedness construct, which is similar to Harrigan's (1985) approach. However, this study applies relatedness to explain the performance of the parent firms, rather than the performance of a child firm, the focus of Harrigan's (1985) study. The present study also argues that the concentration of the child industry is not a

major determinant in explaining the relation between joint ventures and parent firms' performance, and it treats this concentration variable as a potential confounding variable, a different approach from that used by Ravichandran (1986) and Koh and Sinha (1990).

The following section first describes in more detail the concepts of two key variables: relatedness and market performance. Then propositions regarding the relationships between these two variables are presented.

Relatedness

Relatedness is a construct that has generated a large body of strategy research. Relatedness refers to similarities between businesses in resources and skills used to manufacture products or to serve markets. Rumelt (1974), for example, considered businesses to be related if they: (a) served similar markets using similar distribution channels, (b) used similar production technologies, or (c) exploited similar scientific research. Rumelt (1974) determined similarities in resources used to manufacture products based on: similarities in products offered; or relationship between products, which occurs when a product of one business serves as an input for the production of output of another business. Rumelt (1974) determined similarities in resources used to serve markets by comparing similarities in markets served by businesses. Relatedness defined by Rumelt (1974), therefore, has been determined by product/market relatedness.

Rumelt's (1974) definition of relatedness is compatible with that suggested by Salter and Weinhold (1979). The latter classify diversification strategies by key success factors, which are composed of

business experience in product markets and skills in functional activities such as production, marketing, and R & D. An unrelated diversifier is defined as "a company pursuing growth in product markets where the key success factors are unrelated to each other" (Salter & Weinhold, 1979: 7). In contrast, a related diversifier is "a company that uses its skills in a specific functional activity or product market as a basis for diversification" (Salter & Weinhold, 1979: 7). Salter and Weinhold's (1979) definition of relatedness is compatible with that of Rumelt because their key success factors, which are used to determine relatedness between businesses, are composed of the same types of resources and skills that Rumelt (1974) used to determine relatedness between businesses. These resources and skills include those specifically used in production or marketing.

This study makes use of relatedness, the conceptual definition of which follows that of Rumelt (1974) and of Salter and Weinhold (1979). Relatedness was chosen for use because it provides a theoretical ground for explaining differences in firms' performance. Theoretical notions that may explain differences in firms' performance may be developed based on the consideration of similarities between businesses in products, markets, or resources and skills used. Another reason that relatedness was used is that it can, to some extent, explain differences in the performance of firms involved in diversification activities such as mergers or acquisitions (e.g., Singh & Montgomery, 1987; Shelton, 1988). Because joint ventures can be considered one type of diversification activity, it is likely that the relation between relatedness and performance can be generalized from merger/acquisition to joint venture studies.

Relatedness Among Joint Venture Participants

A joint venture consisting of two parents--say parent A (P_A) and parent B (P_B)--and a child (C) can be considered to include three types of relatedness: relatedness between the parents, relatedness between one parent and the child, and relatedness between the other parent and the child. If parent A is of focal interest, parent A is involved in parent-parent relatedness (P_A-P_B), parent-child relatedness (P_A-C) and parents-child relatedness (P_A-C & P_B-C). Parents-child relatedness involves a comparison between the focal parent-child relatedness (P_A-C) and the other parent-child relatedness (P_B-C). Parents-child relatedness is considered here because it is speculated that parent B-child relatedness, by itself, may not help the capital market in determining the value of the joint venture for parent A unless parent B-child relatedness was compared with parent A-child relatedness.

Each of the three types of relatedness in which a focal firm may be involved can be placed on a continuum. The determination of the extent of relatedness is based on product or market similarities. That is, firms that are more related have a higher proportion of revenue coming from similar products or markets. Firms that are less related have a lower proportion of revenue coming from similar products or markets.

The three types of relatedness can be represented graphically. Figure 1 displays examples of four joint ventures that differ in the extent of relatedness. The figure displays parent-parent relatedness and parent-child relatedness, along the horizontal and vertical axes, respectively. Relatedness on each axis is a polarity, i.e., has a low end and a high end. Joint venture (1) is high in two types of

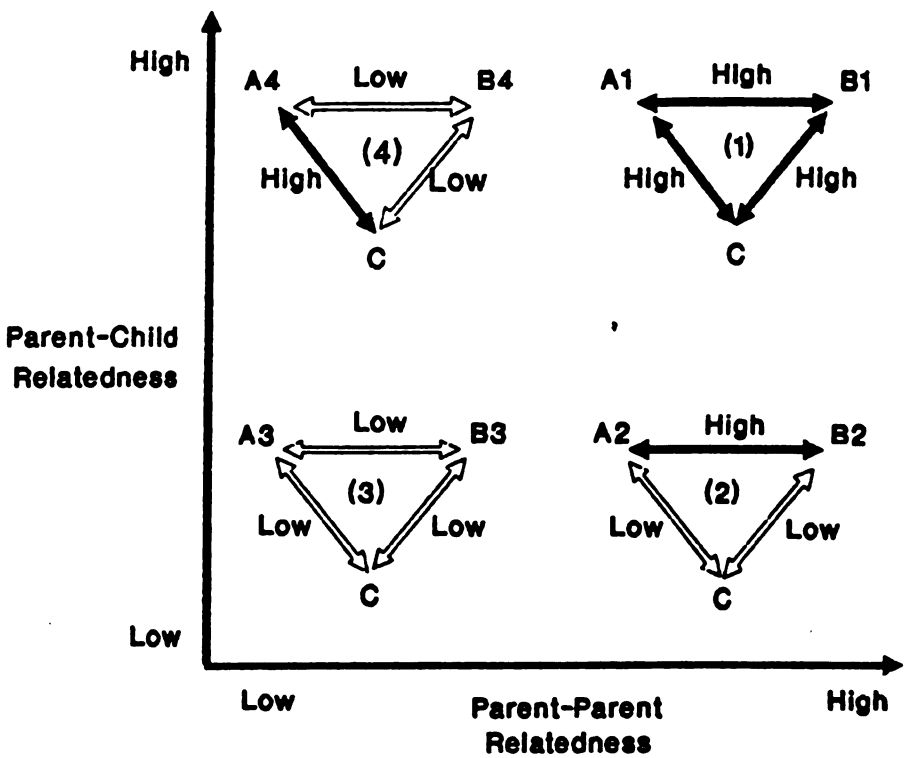

Figure 1

Examples of Joint Ventures that Differ in the Extent of Relatedness

relatedness--parent-parent relatedness and parent-child relatedness--but low in differences between the two parents' relatedness to the child, that is, low in P_{A1}-C and P_{B1}-C difference. Joint venture (2) is high in parent-parent relatedness but low in both parent-child relatedness and differences between the two parents' relatedness to the child. Joint venture (3) is low in all three types of relatedness--parent-parent relatedness, parent-child relatedness and differences between the two parents' relatedness to the child. While joint venture (1), (2) and (3) are low in differences between the two parents' relatedness to the child, joint venture (4) is high in this type of relatedness because the difference between P_{A4}-C and P_{B4}-C is high. The four joint ventures shown in the figure are examples of joint ventures that may exist. Other joint ventures may, however, vary along the continuum of the three types of relatedness.

Market Performance: Stockholder Return

Market performance is concerned with the market valuation of specific activities of firms. One indicator of market performance is stockholder return (Singh & Montgomery, 1987). Market performance or stockholder return was chosen for use in this study because it is a performance goal that extends beyond the stockholders' domain (Lubatkin & Shrieves, 1986). High market valuation or high stockholder return can inhibit proxy battles for control and can enhance a firm's future effectiveness by allowing less costly access to additional equity and debt capital (Branch & Gale, 1983; Lubatkin & Shrieves, 1986; Rappaport, 1986). Rappaport (1986) also suggests that management is induced to pay more attention to stockholder returns because of reasons such as large

stock ownership by management; a tie between stockholder return performance and management compensation; threats of takeover by other firms, especially if the stock price is undervalued; and management's concern for its reputation in managing stockholder returns. High stockholder return is, therefore, central to the focus of management.

Abnormal Stock Return

This study focuses on abnormal stockholder return. Abnormal stock return is the difference between observed and expected returns, which can be estimated from the market model (Fama, 1976). The market model basically states that the return for stock i at day t is linearly related to the return on the market portfolio at day t. The regression coefficients obtained from the market model are used in the residual analysis (Fama et al., 1969), in which abnormal returns are estimated.

According to the market model, the return on a market portfolio reflects market-wide variations affecting all securities in the market, and the residual or abnormal return reflects other variations. Therefore, this study examines abnormal return rather than observed return because it can reflect capital market reaction to variations including those resulting from firms' specific activities.

Positive abnormal return indicates value gains to stockholders. Positive abnormal return for parent firms' stockholders may occur if joint venture announcements lead to an expectation of an increase in future income streams for the parent firms.

Theoretical Framework and Research Hypotheses

This section brings together two variables discussed earlier--relatedness and abnormal stock return. Theoretical arguments for the expected relationship between these two variables across joint ventures are developed. Hypotheses about the expected relationship also are proposed.

Hypothesis One

Joint Venture Announcements and Parent Firms' Abnormal Stock Returns

Previous research found consistent evidence of a positive relationship between joint venture announcements and parent firms' stock returns (e.g., McConnell & Nantell, 1985; Woolridge & Snow, 1990). These studies' interpretation of this positive relationship is that the capital market perceives joint venture announcements, on average, as value-creating activities for parent firms. That is, joint ventures are, on average, expected to generate a future income stream for parent firms and, therefore, the capital market responds positively to the joint venture announcements.

The first hypothesis in this study replicates empirical findings from prior studies. The hypothesized positive relationship between joint venture announcements and abnormal stock returns provides a check of data set for this study--whether the sampled firms used in this study provide the relationship that is consistent with previous findings. The first hypothesis can be stated as:

> H1: Joint venture announcements are positively correlated with parent firms' abnormal stock returns.

Hypothesis Two

Parent-Child Relatedness and Parent Firms' Abnormal Stock Returns

This study assumes that the relationships between joint venture announcements and parent firms' stockholder returns are not homogeneous across joint ventures. It is expected that relatedness among joint venture participants affects such relationships. Hypothesis Two deals with the effects of one type of relatedness--relatedness between parent and child--on parent firms' stockholder returns.

This study argues that parent firms that are more related to their child obtain higher abnormal stock returns than parent firms that are less related to their child. Higher relatedness in products or markets between parent and child may lead to greater positive responses from the capital market than lower relatedness. This is because higher parent-child relatedness may suggest to the capital market that the parent can share with its child both general resources and specialized resources, whereas lower parent-child relatedness may suggest that the parent can share with its child only general resources. The expected sharing of both general and specialized resources associated with parent-child relatedness hence suggests lower average costs and a higher future income stream for the parent that is more related to the child than for the parent less related to the child.

Specialized and general resources differ in their specific use for particular products or markets. Specialized resources may be defined as resources and skills that are used specifically in production or marketing. Specialized resources include, for example, (a) those that are used in production such as production technology, plants, raw

materials, machinery and tools (Ansoff, 1965); (b) those that are used in marketing such as distribution channels, sales force, advertising and sales promotion (Ansoff, 1965); and (c) R & D or management skills that are used in specific product or market areas. Conversely, general resources are defined as resources and skills that can be used across different functions. General resources, therefore, are not tied specifically to production or marketing functions. An example of general resources are financial resources used in hiring accountants or outside consultants.

The association of high relatedness with utilization of specialized and general resources and the association of low relatedness with utilization of general resources have been suggested by several diversification studies. Singh and Montgomery (1987), for example, argue that relatedness allows for more efficient utilization of both specialized and general resources, while unrelatedness allows for more efficient utilization of general resources only. Singh and Montgomery (1987) then hypothesized that related diversifiers obtained higher value gains than unrelated diversifiers, and their findings supported this hypothesis. Other researchers, such as Wrigley (1970), Lubatkin (1984), Hill and Hoskisson (1987), and Jones and Hill (1988), also raise similar arguments. They argue that, whereas related diversifiers can share their inputs, technology, distribution channels, sales forces, financial resources and others, unrelated diversifiers may share only their financial resources. Therefore, a body of diversification literature has proposed the argument that parallels the argument in this study.

The argument that higher parent-child relatedness enables the sharing of general and specialized resources/skills, which then leads to

higher stock returns for parent firms than lower relatedness does, is illustrated in Figure 2. The following discussion is based on this figure.

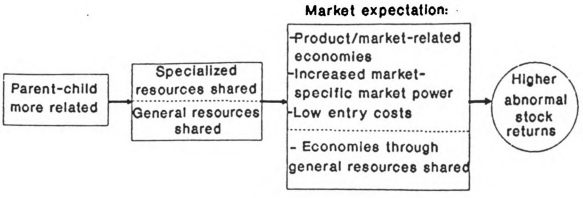

Figure 2
Higher Parent-Child Relatedness

Higher Relatedness between Parent and Child

Higher relatedness in products/markets between a parent firm and its child may suggest to the capital market that the parent is more likely able to share with its child specialized resources and skills used in production or marketing. The parent can, therefore, lower its average costs or enjoy economies and hence can obtain higher future income generated through the joint venture. The parent may share with its related child the resources used specifically in production such as production technology, plants or machinery. This sharing may be done at the same level of production or at different levels of production. This leads to production economies (Lubatkin, 1983; Kogut, 1988; Hennart, 1988) and scheduling economies (Lubatkin, 1983). Production economies may occur through economies of scale or economies of scope. Economies of scale occur when a given bundle of resources is used to expand

production of a specific product. Economies of scope occur when a given bundle of resources is used in a joint production of two or more products. Scheduling economies occur when there is coordination of resources used at various stages of production (Shepherd, 1979). Similarly, sharing with the child specialized resources used in marketing such as sales force or distribution channels enables the parent to obtain marketing economies (Lubatkin, 1983).

Higher product/market relatedness also suggests a better opportunity for parent and child to share specialized skills. High relatedness suggests that the parent can transfer to the child its R & D knowledge or management skills that are specifically tied to products or markets. Kogut (1988), for example, suggests that joint ventures enable firms to transfer "tacit knowledge" (Polanyi, 1967), which is knowledge that is not easily diffused across the boundaries of firms. A joint venture enables the parent to transfer knowledge or experience to the child that operates in similar product/market areas. Cumulative knowledge or experience may lead to low learning costs for the parent.

Higher product/market relatedness may also suggest an increase in market power for the parent. Market power increase may occur because of relatedness in markets or because of lower costs obtained through relatedness in products or markets. Market relatedness between parent and child suggests that the parent may extend its power in currently engaged markets through the formation of the child. Furthermore, an increase in market-specific market power may be facilitated if product/market relatedness enables the parent to lower costs and lower the prices of its products. The firm's ability to exert more influence on price by definition means that it gains more power in the market. An

ability to control price tends to be positively valued by the capital market because it suggests an increased certainty that a firm will obtain future income streams (Oliver, 1990).

The parent that forms a joint venture in related markets also can lower entry costs. This is because the parent tends to possess specialized resources or skills that enable the child's penetration into related markets at minimal costs. Furthermore, possessing specialized resources/skills necessary for success in related markets also suggests that the parent can erect entry barriers in this related market (Hopkins, 1987). This may lead the capital market to expect longer retention of the parent's profits.

Finally, relatedness in products/markets between the parent and its child also suggests that the parent can share with the child general resources such as financial resources and hence can obtain financial economies (Lubatkin, 1984). Financial economies may occur when the parent can improve its cash management, allocate more efficiently its investment capital or reduce the cost of debt capital (Paine & Power, 1984).

Lower Relatedness between Parent and Child

A parent firm that is less related to its child may not be able to utilize resources and skills as efficiently as a parent that is more related to the child. This leads to the expectation that the former parent can obtain lower abnormal stock returns through a joint venture than the latter parent can. This notion is illustrated in Figure 3.

As the figure shows, low relatedness in products and markets suggests that the parent can share with its child only general

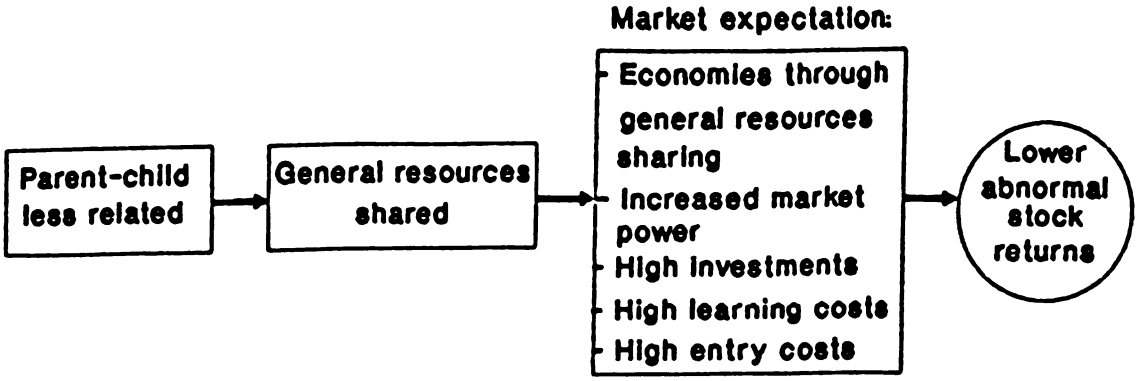

Figure 3
Lower Parent-Child Relatedness

resources, not the specialized resources used in production or marketing. A sharing of general resources may suggest lowered costs for the parent due to lower bankruptcy risk or increased administrative efficiencies. In addition to lowered cost obtained through general resources sharing, the parent that is less related to its child can increase its market power. This market power increase may arise, for example, from the increase in absolute size and breadth of the firm.

Low relatedness between parent and child in products/markets also suggests to the capital market that the parent may not be able to share with the child its production technology, distribution channels, or specific R & D strength. This means that the parent firm has to bear high startup costs, including: (a) costs of investing in assets such as plants or production technology (Ansoff, 1965); (b) learning costs that occur because management makes a misallocation of resources during the learning process of a new business (Salter & Weinhold, 1979); and (c) entry costs, which include large investments of financial resources in risky or unrecoverable up-front operational activities such as advertising, costs of switching buyers from competitors' product to the child firm's product, costs of persuading distribution channels to

accept the child firm's product through price breaks or cooperative advertising allowances, costs relating to government restrictions such as air and water pollution standards and product safety and efficiency regulations, and other types of costs incurred to enable the child firm to compete with the cost advantages kept proprietary by established firms (Porter, 1980). The cost advantages enjoyed by established firms are related to such factors as proprietary product technology, favorable access to raw materials, favorable locations, and government subsidies (Porter, 1980).

Parent firms that are less related to their child firm are expected to obtain lower abnormal stock returns than those more related to the child firm because the former have to bear the high costs associated with low parent-child relatedness. These high costs may not be offset by lowered costs obtained through sharing general resources. The capital market would then expect the association of higher abnormal stock returns with higher parent-child relatedness and the association of lower abnormal stock returns with lower parent-child relatedness. This notion is indicated in the second hypothesis:

> H2: Parent firms that are more related to their child obtain higher abnormal stock returns than parent firms that are less related to their child.

Hypothesis Three

Parent-Parent Relatedness and Parent Firms' Abnormal Stock Returns

This study argues that parent firms that are more related to their partners obtain higher abnormal stock returns than parents that are less related to their partners. The logic for this argument is

presented in Figure 4.

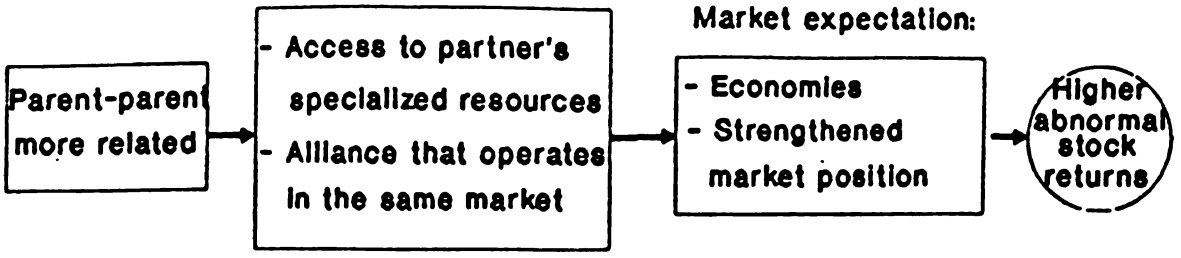

Figure 4
Higher Parent-Parent Relatedness

Product relatedness between parent firms in a venture may lead to market expectation that these firms can have access to specialized resources, such as the production technology of their partners. This access may enable the firms to improve their production technology and hence lower their costs. Market relatedness between parent firms means that these firms operate in the same market and forming an alliance may help strengthen the market position of both. For instance, the parent firms may join forces to preempt suppliers or customers from integrating in a manner unfavorable to them and hence can defend or improve their current market positions (Harrigan, 1985). This preemption enables the firms to sustain their future income streams. High product or market relatedness between parent firms can, therefore, lead to high abnormal stock returns for the parents. In contrast, for parent firms that are less related, the capital market may expect that these firms cannot obtain advantages associated with parent-parent relatedness. Low relatedness between parents, therefore, leads to low abnormal stock returns for the parent firms. This is the third hypothesis:

H3: Parent firms that are more related to their partners obtain higher abnormal stock returns than parent firms that are less related to their partners.

Hypothesis Four

Parents-Child Relatedness and Parent Firms' Abnormal Stock Returns

This study argues that high relatedness between one parent and child may create high abnormal stock returns not only for that parent, but also for another parent that is less related to the child. A joint venture in which parent firms greatly differ in their relatedness with the child--in which one has high relatedness while the other has low relatedness--may enable the parent with low child relatedness to obtain high abnormal stock returns. This is because high relatedness between one parent and the child helps compensate for the potential disadvantages associated with the low relatedness between the other parent and the child. The parent firm that is more related to the child in products or markets is likely able to provide specialized resources such as production technology, sales force, distribution channels, and management skills to the child. The parent firm that is much less related to the child would then benefit from the high relatedness between its partner and the child. The parent with low child relatedness may not have to bear high investment costs because its partner has already invested some assets in the child's market. The parent with low child relatedness may not have to bear high learning or high entry costs because its partner already has some knowledge in the child's market and already has a toehold in the market. Therefore, among the parent firms that have low relatedness with the child, the greater the differences between these parents and their partners in relatedness with the child, the higher the abnormal stock returns that these parents may obtain. This is the fourth hypothesis:

H4: Among the parent firms that are unrelated to their child, those whose partners are more related to their child obtain higher abnormal stock returns than those whose partners are less related to their child.

The rationale underlying this fourth hypothesis is consistent with the rationale underlying prior hypotheses. That is, higher parent-child relatedness leads to higher abnormal stock returns for the parent than lower parent-child relatedness. In a sense, this last hypothesis can be thought of as an extension of this rationale to a situation in which high relatedness between one parent and child can compensate, to some extent, for low relatedness between the child and the other parent involved in the same joint venture. High relatedness between one parent and child can result in high abnormal stock returns to the other parent that is much less related to the child.

Research Hypotheses: Summary

The present study proposes four hypotheses. Hypothesis One focuses on the relationship between joint venture announcements and abnormal stock returns for the entire sample of parent firms. Hypothesis Two focuses on the relationship between parent-child relatedness and parent firms' abnormal stock returns. Hypothesis Three focuses on the relationship between parent-parent relatedness and parent firms' abnormal stock returns. Finally, Hypothesis Four focuses on the relationship between the differences in the two parents' relatedness to the child and parent firms' abnormal stock returns. The focus of Hypothesis Four is on the parent firms that are unrelated to the child.

Potential Confounding Variables

The relationship between relatedness among joint venture participants and parent firms' abnormal stock returns may be affected by several potential confounding variables. Four potential confounding variables can be identified from prior research and from logical reasoning. This study controls for the effects of these variables, including parent firm size (McConnell & Nantell, 1985), industrial concentration (Ravichandran, 1986; Koh & Sinha, 1990), potential market impact, and price-regulated industries (McConnell & Nantell, 1985: Ravichandran, 1986).

Parent Firm Size

Evidence revealing the effects of parent firm size on parent firms' performance has been mixed. Berg and Friedman (1980), for example, found that the average size of parent firms, as measured by average sales, was among other variables that had a positive impact on firms' accounting rate of return. They explained that this was because large firms were better able to capitalize the technological and other contributions of small firms. The effect of parent firm size on firms' performance was also suggested by Harrigan (1988). Harrigan (1988) found that the size of parent firms' assets added weak predictive power to the regression model of ventures' perceived success.

Within finance literature, some evidence exists that small firms earn significantly higher risk-adjusted returns than large firms (Banz, 1981; Reinganum, 1983). One explanation is that investors who had limited information were uncertain about the true parameters of the return distribution of small firms. Therefore, only a subset of

investors would hold the securities of small firms and this then led to the higher risk-adjusted returns of these securities than of securities considered by all investors (Banz, 1978).

In a study on joint ventures by McConnell and Nantell (1985), these researchers reported that, around the announcement date, parent firms of smaller size obtained a higher percentage of abnormal returns (1.10%) than larger firms (0.63%) while obtaining smaller dollar value gains. That is, when the rates of return were multiplied to the average market value of outstanding equity for firms, parent firms of smaller size generated value gains of $4,537,572 compared with $6,650,544 for larger parent firms. In contrast to McConnell and Nantell's findings, Ravichandran (1986) did not find significant effects of firm size on parent firms' performance. Ravichandran (1986) regressed the value gains on firm size and joint venture project costs and found that neither of the coefficients was significantly different from zero. Because of the problematic role of the parent firm size variable on firms' performance, the present study controls for this variable.

Industrial Concentration

There has been evidence of the effects of the concentration of the child industry on parent firms' performance. These effects, as reported by prior studies (Ravichandran, 1986; Koh & Sinha, 1990), were, however, in different directions. Ravichandran (1986) found that firms entering into joint ventures in competitive industries did not earn significant value gains, whereas firms entering into joint ventures in concentrated industries earned significant value gains. Ravichandran (1986) explained that this occurred because the capital market did not

believe that parent firms could retain the benefits derived from the joint ventures in competitive industries for a long period because of low entry barriers. For concentrated industries, however, the industries signalled to the capital market the ability of parent firms to retain benefits derived from the joint ventures.

Ravichandran's (1986) explanations for the effects of industrial concentration on parent firms are, however, inconsistent and hence questionable. While his explanation for no value gains for firms entering into joint ventures in competitive industries focuses on the firms that are newcomers, his explanation for value gains for firms entering into joint ventures in concentrated industries seems to focus more on the firms once they succeed in entering these industries. He seems to neglect the fact that the child firm is a newcomer and that unless it has some strengths that can lower entry barriers in the concentrated industry, it is not likely to enter this industry easily and may not earn high profits at all. As Yip (1982) points out, market concentration indicates the extent to which market leaders will react against entrants and barriers to entry. Therefore, it is likely that the capital market considers ease in entry of the child firm into a concentrated industry along with the child's ability to retain profits generated.

The study by Koh and Sinha (1990) found contrasting evidence regarding the directions of the effects of industrial concentration on firms' performance. Koh and Sinha (1990) limited their sample to horizontal joint ventures in which a joint venture is a new entrant in the parents' industry. They found that horizontal joint ventures increased the value gains of parent firms when the industry was not

highly concentrated. Their rationale was that, in such industry, the increase in the output of a parent firm is sufficient to offset a reduction in industry price associated with an increase in output. When industrial concentration is high, however, the increase in output of a parent may not be sufficient to compensate for a reduction in price in response to any increase in output.

Though these two prior studies by Ravichandran (1986) and by Koh and Sinha (1990) report opposite directions of the effects of industrial concentration, the studies agree on the effects of industrial concentration on parent firms' stockholder returns. This study, therefore, controls for the effect of the concentration of a child firm's industry.

Potential Market Impact

There is good reason to believe that the capital market reaction to joint venture announcements may be affected by the market's expectation of the parent firms' ability to influence the industry entered by a joint venture. The more influence that the parent can have on the child industry, the more likely that the child will be a superior performer in its industry. For instance, the more relevant resources/skills that the parent can contribute to the child, the more likely that the child will be a high performer. Higher performance of the child suggests higher returns to the parent. The capital market may, therefore, react more positively to joint ventures in which parents have greater potential to influence the child's industry than those in which parents have lower potential influence. This study, therefore, controls for the effects of potential market impact on parent firms'

performance.

Price-Regulated Industries

Prior joint venture research controlled for the effects of three price-regulated industries on parent firms' performance. McConnell and Nantell (1985), for example, excluded from their sample joint ventures for constructing power generating units, drilling and exploring for oil and natural gas and constructing oil and gas pipelines. Ravichandran (1986) investigated joint ventures in regulated utility industries separately. The three price-regulated industries may influence parent firms' performance because the capital market may believe that joint ventures in these industries can earn a rate of return equal to the risk-adjusted cost of capital only (Ravichandran, 1986). Ravichandran (1986) reports supporting evidence for this explanation. He found that joint ventures in regulated utility industries led to insignificant abnormal returns for parent firms. Joint ventures in oil exploration industries led to abnormal returns that were, though not statistically significant, lower than comparison period returns derived from comparison period methodology (Masulis, 1980; Dann, 1981; Mikkelson, 1981). Because earlier studies found consistent evidence for the effects of three price-regulated industries, including electric utility, oil and gas exploration and oil and gas transmission, this study controls for this variable.

Even though McConnell and Nantell (1985) and Ravichandran (1986) offer a rationale for the control of effects of three price-regulated industries, it should not be generalized that other regulated industries may affect parent firms' performance. In other words, the regulation of

an industry may be a necessary but inadequate factor to explain differences in parent firms' performance in other industries. Ravichandran (1986), for example, examined joint ventures during the period 1972-1983. During this period--i.e., in 1978--a deregulation of the oil and gas exploration industry occurred. Ravichandran's (1986) finding of lower abnormal returns for the oil and gas exploration industry during the announcement period than during the comparison period covers both the regulated and deregulated periods of this industry. Ravichandran's (1986) findings then cannot directly indicate that the negative market response to the joint ventures in the oil and gas exploration industry occurred because of the regulation effects. Furthermore, Ravichandran (1986) also reports that joint ventures in some industries, such as communication industries before they were deregulated, did not lead to negative responses from the capital market.

A control for the effects of three regulated industries was performed in this study not solely because these were regulated industries, but because of the types of industries. These three industries may have had past negative average abnormal returns and, therefore, the capital market did not respond positively to joint ventures in these industries. Clarke (1980), for example, found that the utility industries had negative abnormal returns during the period of examination. However, because the focus of this study is not to examine the effects of different types of industries on firms, this study controls for the effects of these three industries by forming a subsample of joint ventures in these industries.

CHAPTER THREE

METHODOLOGY

The purpose of this study is to investigate the relationship between joint ventures and parent firms' market performance. More specifically, the study focuses on the relation between relatedness among joint venture participants and parent firms' stock returns. This chapter defines and operationalizes key variables, describes the sampling procedure, and explains the statistical methods for hypotheses testing.

Conceptual Definitions

Relatedness among Joint Venture Participants

Relatedness among joint venture participants is an independent variable for this study. Relatedness (Rumelt, 1974; Salter & Weinhold, 1979) pertains to the relationships between businesses through products or markets. Businesses are considered related if they offer similar products, serve similar markets or use similar resources or skills. Businesses are also considered related if they are engaged in sequential stages of product processing activities. On the contrary, businesses are considered unrelated if they have no relationship through products and markets.

This study determines relatedness based on the concept proposed

by Rumelt (1974) and by Salter and Weinhold (1979). Relatedness was determined based on similarities between business segments in products or markets. Participating firms' businesses were, therefore, considered related if they met any of the following criteria: (a) offered similar products, (b) served similar markets, or (c) engaged in different stages of product processing activities. Participating firms' businesses were considered unrelated if they did not meet any of these criteria.

Product similarity or product relatedness was determined by comparing business segments of participating firms. A business segment is a group of related products that accounts for some portion of the consolidated revenue of a firm (Amit & Livnat, 1988). For example, a building material segment consists of groups of related products such as plywood, lumber, logs, veneers and adhesive. A paper segment may include related products such as fine paper and milk cartons. Participating firms' products that belong to the same business segment are considered related.

Several approaches can be used to determine market similarity or market relatedness, but perhaps the most fundamental one is through customer types: consumer vs. industrial markets (Risley, 1972; Stanton, 1981; Udell, 1972). Webster (1978), for example, highlights four dimensions across which consumer and industrial marketing differ: functional interdependence, product complexity, buyer-seller interdependence and buying process complexity. Webster (1978), comparing consumer and industrial marketing, argues that (a) industrial marketing success depends more on other functions in the organization; (b) industrial products are more complex because they involve a variety of economic, technical and personal relationships between buyer and

seller; (c) industrial marketing has a high degree of buyer-seller dependence that goes beyond the transaction; and (d) industrial marketing is a more complex buying process because of the firm's environment.

Empirical evidence exists to support the notion that industrial and consumer markets do differ. Day, MacMillan and Hambrick (1983a), for example, reported that consumer buyers had more emotional needs, were less knowledgeable, were greater in number and were more fragmented than industrial buyers, and that consumer marketers faced greater short-term uncertainty. Profiles of firms selling to industrial and consumer markets also were found to be different across several strategic dimensions (Day, MacMillan & Hambrick, 1983b). For example, consumer businesses had a higher fraction of sales represented by advertising and promotional expenses, purchases and finished goods inventories, whereas industrial businesses had a higher fraction represented by manufacturing costs, value added, in-process inventories, receivables, and R & D expenditures.

Industrial markets may be further subcategorized according to the following range of industries (Stanton, 1984): (a) agriculture, forestry and fishing (SIC 01 to 09); (b) mining and quarrying (SIC 10 to 14); (c) construction (SIC 15 to 19); (d) manufacturing (SIC 20 to 39); (e) transportation, communication and other public utilities (SIC 40 to 49); (f) wholesale and retail trade (SIC 50 to 59); (g) finance, insurance and real estate (SIC 70 to 89); (h) services (SIC 70 to 89); and (i) government (SIC 90 to 93). These nine groups of industries are consistent with nine major divisions of industries listed in the Standard Industrial Classification (SIC) Manual (1987) prepared by the

Office of Management and Budget. The two-digit SIC codes for each division of industries appear in the parentheses after each division.

Business segments of firms would be considered related in industrial markets only when they shared the same subcategories of these markets. This criterion was used because consumers in different subcategories of industrial markets had been shown to be different. Government markets, for example, are different in procurement processes from those in the private sector of the industrial markets (Stanton, 1984). The categories and subcategories of markets considered in this study are shown in Table 1. Table 1 includes two market categories: consumer and industrial. The industrial market is categorized into nine groups.

In addition to relatedness based on product or market similarity, another criterion for determining relatedness between businesses is that the businesses are engaged in sequential stages of product processing activities. In other words, businesses are considered related if the product of one business serves as an input for the product processing of another business. For example, if firm A's business is mining bauxite and firm's B business is fabricating aluminum, these two firms' businesses would be considered related. The bauxite product of firm A can serve as an input for processing aluminum, the product of firm B.

One approach to determine whether the product of one business can be used as an input for the production process of another business is to use customer types or markets as an indicator. When the customers or the users of the product of one business are in the same business as the operator of another business being compared, these two businesses

Table 1

Market Categories and Subcategories

Market Category	Market Subcategory
Consumer market	
Industrial market:	(1) agriculture, forestry and fishing;
	(2) mining, oil and gas extraction;
	(3) construction;
	(4) manufacturing: food products, tobacco products, textile mill products, apparel products, lumber and wood products, furniture and fixtures, paper and allied products, printing and publishing products, chemicals and allied products, petroleum refining and related industries, rubber and plastic products, leather and leather products, stone, clay, glass and concrete products, primary metal industries, fabricated metal products, industrial machinery and computer equipment, electronic and other electrical equipment, transportation equipment, measuring and controlling instruments, miscellaneous manufacturing industries;
	(5) transportation, communication, electric, gas and sanitary services;
	(6) wholesale and retail trade;
	(7) finance, insurance and real estate;
	(8) services;
	(9) government

are considered related. For instance, if the products of two businesses being compared are metallurgical coal and steel, respectively, and the coal buyers are steel producers, these two businesses are related because the metallurgical coal is an input for the steel production process.

To summarize, joint venture participants may be related through either products or markets. This section proposes the criteria that was used to determine product or market relatedness. This determination was performed in the development of a measure of relatedness among joint venture participants.

Market-based Performance

Firms' market-based performance is a dependent variable for this study. Firms' market-based performance can be defined as the performance of firms as valued by the capital market.

Measurement

Development of a Measure of Relatedness among Joint Venture Participants

One measure of relatedness was developed by Wrigley (1970) and later elaborated by Rumelt (1974). Rumelt's (1974) determination of relatedness between diversified and original businesses of a firm was made mainly through consideration of the proportion of firms' revenues generated by business segments that were considered related. The categorical measure of relatedness was then developed based on this information. This measure of Rumelt (1974) has been commended for its firm specificity (Montgomery, 1982). That is, the measure conveys specific information about firms' similar products or markets and the

revenue generated by these product/market areas. Even though the measure was criticized for its dependence on subjective judgment (Palepu, 1985), research suggests that the interrater reliability and convergence of this measure with other diversification measures are both high and acceptable (e.g., Montgomery, 1982).

Whereas a measure of relatedness developed by Rumelt (1974) is categorical, a measure of "strategic fit", or relatedness between acquiring and acquired firms developed by Shelton (1988), is continuous. Shelton (1988) subjectively determines the relatedness between businesses through consideration of similarities between products or markets for each pair of the firms' business segments. She then derives a continuous measure of relatedness, based on information on the proportion of revenue generated by related business segments of the firms. This continuous measure has strength in that there is no information loss such as that which occurs when using categorical measures (Cohen & Cohen, 1983).

The present study develops a continuous measure of relatedness. The procedure for developing the measure follows closely the procedure used by Shelton (1988). The derivation of this measure, like those of Rumelt (1974) and Shelton (1988), depends mainly on subjective judgment. Information on product/market similarities between businesses is used in the determination of relatedness. This measure of relatedness, therefore, has strengths in conveying specific information about firms' products or markets and in utilizing all available data.

The procedure used to develop a continuous measure of relatedness between each pair of joint venture participants, such as a pair made up of two parents or a pair of one parent and one child, can

be described as follows. First, information on products, markets and sales breakdown for various business segments of a pair of firms was collected. Then the collected information on products or markets was used in the determination of relatedness between each pair of business segments of these two firms. At this stage, the determination was based on a dichotomy of relatedness, i.e., related or unrelated. The criteria for determining relatedness or unrelatedness between business segments of firms are those proposed earlier in this chapter. Next, sales revenue generated by each business segment of one firm was multiplied by sales revenue generated by each business segment of the other firm. Finally, the products of multiplied revenue for the pairs of related business segments were added up. The result of this addition is the continuous measure of relatedness between the two firms of interest.

The measure of relatedness between any pair of firms ranges from 0 to 100%, with 0% of relatedness between any pair of firms indicating that the firms are unrelated because they have no similar product or market areas. None of the revenue of these two firms comes from similar products or markets. On the other hand, 100% of relatedness between any pair of firms indicates that the firms are totally related because they are involved in similar products or markets and total sales revenues of these two firms come from similar products or markets. A measure of relatedness between different pairs of firms may also vary between these two extremes, i.e., between 0 and 100%. Firms that have higher levels of relatedness measure can be interpreted as having greater relatedness than firms that have lower levels of relatedness measure.

As mentioned earlier, the above procedure to develop the measure of relatedness could be applied to any pair of firms, such as a pair

made up of two parents or a pair of one parent and one child. The following example describes how the procedure can be followed in the development of a continuous measure of relatedness between a pair of parent firms. The two parent firms in the example, American Can Co. and Pope & Talbot, Inc., first announced their joint venture in the Wall Street Journal on 3/29/77. To determine the relatedness between these two parents, the information about their business segments--products and/or markets and sales revenue--was collected. Table 2 displays the collected information about the business segments of these two parent firms. The table consists of two panels: The upper panel contains information about business segments of American Can Co.; the lower panel contains the information about business segments of Pope & Talbot, Inc.. The business segments of each parent were arrayed along the column headings. Then the information on sales breakdown and on products and markets for each business segment was presented. Other available information, such as the contributions of the parent firm to the child, was included at the bottom of each panel.

The collected information about these two parents was then used to determine relatedness between each pair of business segments of the parent firms. Outcome of the determination is a measure of relatedness between two parents, as displayed in Table 3.

Table 3 presents the business segments of Pope & Talbot, Inc. and of American Can Co. along the horizontal axis and vertical axis, respectively. The percentages of sales revenues generated by each business segment of the firms appears in the parentheses. Pope & Talbot, Inc. had two business segments: lumber and wood, and land development, and these two segments generated 96% and 4%, respectively,

Table 2

Information about Business Segments of Parent Firms

Parent Firm (1): American Can Co.

Businesses	Container & packaging Products	Paper products	Chemical products & others
Sales breakdown	55% + 15%	20%	10%
Product examples	Metal cans and composite containers, plastic tubes and bottles	Disposable cups and plates, facial tissues, paper napkin	Specialty chemicals
Markets	Industrial: brewing, and food	Industrial and household users	Industrial: pharmaceutical, cosmetic, textile and plastic

Contributions to the child: American Can Co. manages the entire pulp and paper complex

Parent Firm (2): Pope & Talbot, Inc.

Businesses	Lumber & wood products	Land development
Sales breakdown	96%	4%
Product examples	Lumber, hardboard, Plywood and veneer	
Markets	Industrial: Paper products	Consumers

Contributions to the child: Pope & Talbot, Inc. supplies long-term wood fiber requirements to the child.

Table 3

Measure of Relatedness between Two Parents

		Pope & Talbot, Inc.	
		Lumber and wood (96%)	Land development (4%)
American Can Co.	Packaging (70%)	Unrelated (70%×96%)	Unrelated (70%×4%)
	Paper products (20%)	Related (20%×96%)	Unrelated (20%×4%)
	Specialty chemicals (10%)	Unrelated (10%×96%)	Unrelated (10%×4%)

of the firm's total sales revenues. American Can Co. had three business segments: packaging, paper products, and specialty chemicals, and these three segments accounted for 70%, 20% and 10%, respectively, of the firm's sales revenues. The relatedness of each pair of business segments of these two firms was then considered, based on the proposed criteria regarding product or market similarities. A pair of segments consisting of Pope & Talbot's land development segment and American Can's packaging segment, for example, was considered unrelated because these two segments were related neither through products nor markets. On the other hand, Pope & Talbot's lumber and wood segment and American Can's paper products segment were considered related because wood fiber is used as a raw material for the pulp and paper product segment. Finally, for the business segments that were considered related, the products of multiplied revenues for these segments were added up. Because only the lumber and wood segment of Pope & Talbot and the paper product segment of American Can are related, the relatedness between these two firms is equal to the products of multiplied revenue generated by these two segments, or 19.2%.

A measure of the relatedness between a parent and a child can be developed following the same procedure. In the example of a joint venture between American Can Co. & Pope & Talbot, Inc., the child was established to own and operate American Can's pulp mill in Oregon. Because this pulp mill provides raw materials for the paper products segment of American Can Co. and this business segment generates 20% of sales revenues for the company, the relatedness measure between American Can Co. and the child is hence 20% multiplied by 100%, or 20%. The paper mill that the child would operate would obtain wood fiber from the

other parent, Pope & Talbot, Inc. Because the lumber and wood products segment of Pope & Talbot accounts for 96% of the company's total sales, the relatedness measure between Pope & Talbot, Inc., and the child firm is 96% multiplied by 100%, or 96%.

Measure of Relatedness Among Joint Venture Participants: Summary

To sum up, the measure of relatedness between two parent firms or between a parent and a child firm is a continuous measure. This relatedness measure's strength is its focus on firms' specific aspects, such as products and markets for each business segment and the percentage of revenue generated by these business segments. A summation of the percentages of revenue generated from the firms' related business segments is a measure of relatedness between the firms.

Measure of Market Performance

Within strategy and finance literature, one popular indicator of a firm's market-based performance is stock returns (Lubatkin & Shrieves, 1986). Stockholder returns have been used to indicate the effects of events such as merger announcements (e.g., Mandelker, 1974; Chatterjee, 1986; Singh & Montgomery, 1987) and joint venture announcements (McConnell & Nantell, 1986; Ravichandran, 1986). Because this study examines the effects of joint venture announcements on the capital market, stockholder returns are thus a relevant measure of firms' performance.

Measure of Parent Firm Size

Parent firm size, one potential confounding variable, was measured in this study by the market value of a firm's outstanding stock at year end prior to the year of the joint venture announcement. This measure was selected because of its relevance to the study's purpose of examining the effects of joint ventures on stockholder returns. This measure also is consistent with the measure used in several prior studies (e.g., McConnell & Nantell, 1985).

Measure of Industrial Concentration

Industrial concentration, another potential confounding variable, is represented by the percentage of total industry sales contributed by the largest few firms, ranked in order of market share (Scherer, 1980). The most commonly used indicator of industrial concentration is perhaps the four-firm concentration ratio. The four-firm concentration ratio is the percentage of total industry sales originated by the leading four firms. The ratios, which are published in the Census of Manufactures, are prepared by the U.S. Department of Commerce, Bureau of the Census. Because a number of studies, including joint venture studies, have used the four-firm concentration ratio, this study used the same ratio to indicate the concentration level of a child industry.

Measure of Potential Market Impact

Potential market impact is another potential confounding variable. One indicator of the impact that the parent firm may have on the child industry is the size of the parent firm relative to the size

of the child industry. The size of the child industry has been frequently represented by industry sales, so, to be compared on the same basis, the parent firm size is represented by its sales revenues. The potential market impact of parent firms in a venture is, therefore, measured by the proportion of the combined sales of the parent firms to the sales of the child industry. Potential market impact that the joint venture between Du Pont Co. and National Distiller & Chemical Co. announced 10/08/75, for example, may have on synthetic gas industry, the child industry, is equal to the combined sales of Du Pont Co. and National Distiller & Chemical Co. divided by the sales of the child industry. The sales revenue of Du Pont Co., of National Distiller & Chemical Co., and of the child industry for the year 1974 were $6910.1, $1430.1, and $679.3 million, respectively. The value of potential market impact is, therefore, 12.28 or $(6910.10+1430.1)/679.3.

Data Sources

The information necessary for the determination of relatedness among joint venture participants, the independent variable, was obtained from several sources. These sources included Moody's Industrial Manual, Compustat tape, 10-K reports, annual reports, and joint venture announcements in the Wall Street Journal. These sources supplement each other in providing information about firms' products, markets and sales revenues. For each joint venture, information on parent firms' products, markets and sales revenues from Moody's Industrial Manual or from annual reports one year prior to the year of joint venture announcement was used. This is likely to be the most recent information that the capital market could use to make a judgment about relatedness

between parent firms. Information about the child firm's business came mainly from the joint venture announcement in the Wall Street Journal.

The data on parent firms' observed stock returns, which were used to derive abnormal stock returns, the dependent variable, were obtained from the Center for Research in Security Prices (CRSP) daily tapes. These tapes are also maintained at Michigan State University.

Sample Selection

An initial sample of joint ventures was composed of joint ventures that were first publicly announced in the Wall Street Journal over the period beginning January 1975 and ending December 1987. The announcements in the Wall Street Journal were used as a source for primary sample selection for several reasons. One reason was that both the New York Stock Exchange (NYSE) and the American Stock Exchange (ASE) require member firms to transmit "any release of information that could reasonably be expected to have impact on the market for the company's securities" to Dow Jones & Company, and, presumably, most of these releases subsequently appear in the Wall Street Journal, a Dow Jones publication. Another reason was that the Wall Street Journal provides daily information so that the date of the announcement event could be specified precisely. Furthermore, the Wall Street Journal has long served as a source for primary sample selection for research in the finance area (Thompson, Olsen & Dietrich, 1987).

The index of joint venture announcements in the Wall Street Journal appears in two sources, i.e., the joint venture section of the special tabulation column in Predicasts Funk and Scott Index of Corporate Changes and the joint venture section in Wall Street Journal

Index. These two sources of index on joint venture announcements, though overlapping to some extent, were not identical and were used to complement each other. The Predicasts Funk & Scott Index of Corporate Changes abstracts articles from over 750 financial publications and trade magazines, including the Wall Street Journal, and thus provides a more comprehensive index of joint venture announcements than the Wall Street Journal Index. The Wall Street Journal Index, on the other hand, provides more descriptive information about the joint venture announcements than the Predicasts Funk & Scott Index of Corporate Changes.

A thirteen-year period, from 1975 to 1987, was chosen to increase the probability that statistical power can be achieved. The statistical power, as expressed by $1-\beta$, involves the probability of avoiding type II errors. Type II errors or β occurs when the null hypothesis is not rejected, even though it is false. A thirteen-year period increases the probability that the sample size approaches a desirable level and statistical power can be achieved. Furthermore, the period from 1975 to 1987 covers relatively recent announcements of joint ventures and choosing that period enables examination of recent responses of the capital market to such announcements.

To be included in the final sample, a joint venture has to meet several criteria. First, each joint venture must have only two parent firms at the time of the announcement. This criterion was specified to control for variations in the number of parent firms that were involved in a joint venture. Second, both parent firms in each joint venture must be U.S. corporations. This criterion helps avoid possible contaminating effects of international diversification associated with

international joint ventures. Third, information from the Wall Street Journal Index for a 40-day period surrounding each joint venture announcement--i.e., 20 days before and 20 days after the announcement date--contains no other joint venture or acquisition announcements that can have impact on the stock price. This criterion was specified to lessen the effects of these events on parent firms' stock prices. Finally, the announcements of joint ventures in the Wall Street Journal have not been preceded by other publications. This criterion helps ensure that the joint venture announcements in the Wall Street Journal triggered the initial responses of the capital market to the announcements.

From each sampled joint venture, only one parent firm was selected. These selected firms became the sampled firms in this study. The rationale for selecting only one parent firm from a sampled joint venture is to avoid a potential problem of violating the assumption of cross-sectional independence of returns. This assumption may be violated if the stockholder returns of parent firms engaging in the same joint venture are simultaneously considered. The criteria for selecting one parent from each sampled joint venture are that: the firm has to be traded on the NYSE or the ASE, and the firm's stock return data must be available on the CRSP tape for a period of 100 days prior to the joint venture announcement and 20 days following the announcement. For a joint venture consisting of two parent firms, both of whose stock return data are available on the CRSP tape, one parent firm would be randomly selected from the joint venture.

The screening procedure yielded a sample of 209 announced joint ventures entered by 209 firms during the period 1975-1987. This study

does not claim that the sampled joint ventures are representative of the total joint venture population in the United States, which may be considered to be composed of all joint ventures formed in the United States by all domestic parents, by all foreign parents, or by domestic and foreign parents in all types of industries and over a number of years. The sampled joint ventures are, however, considered representative of the target population, which is composed of domestic joint ventures consisting of two parents. The sampled joint ventures can well represent the target population because the sample size is sufficiently large and the joint ventures formed in all types of industries over a number of years are included in the sample.

Methods of Analysis

Derivation of Abnormal Stock Returns through Residual Analysis

The primary methodology used to derive abnormal stock returns, the dependent variable, was a residual analysis based on the market model (Fama, 1976). The technique was pioneered by Fama et al. (1969) and was described in Fama (1976) and Brown and Warner (1980). The market model predicts each security's return, given the market return, which is a control for exogenous events, and given the firm's historical relationship to the market. The regression equation of the market model may be written as:

$$\tilde{R}_{it} = \alpha_i + \beta_i \tilde{R}_{mt} + \epsilon_{it} \qquad (1)$$

where $\tilde{R}_{it}$ = individual firm's daily return for stock i on day t

$\tilde{R}_{mt}$ = market portfolio's daily return or value-weighted aggregation of all risky securities available for investment

α_i = intercept term for stock i

β_i = historical market relationship for stock i

ϵ_{it} = disturbance term in the model for security i at time t - this is normally distributed with mean 0 and variance σ^2, i.e., $\epsilon_{it} \sim N(0,\sigma^2)$.

According to the market model, each security's period t return is expressed as a linear function of the contemporaneous market return ($\tilde{R}_{mt}$) plus an error term. The model controls for market-wide variations through market return, $\tilde{R}_{mt}$. Any variations due to factors not present in the market portfolio will be captured in the disturbance term, ϵ_{it}. The regression coefficients from the market model in equation (1) were estimated over a maximum of 100 and a minimum of 20 trading days prior to each joint venture announcement date, represented by day 0. The relative days, defined as the days relative to the announcement date, that were included in the analysis ran from day -100 to day +20.

The regression coefficients in equation (1), which were estimated during day -100 to day -21, were used in a prediction of R_{it}, with resulting prediction errors or residuals for the test period, running from day -20 to day +20. The prediction error, which indicates the abnormal return to stock i at time t, can be expressed as:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}) \qquad t = -20 \ldots +20 \qquad (2)$$

where AR_{it} = abnormal returns or residuals for stock i at day t

$\hat{\alpha}_i$, $\hat{\beta}_i$ = estimated values of coefficient in equation (1)

R_{it} & R_{mt} = observed returns for stock i and market portfolio, respectively, at day t relative to the announcement date (e.g., t = -20...+20).

The abnormal return was calculated for each day during the test period. Daily returns were used, rather than monthly returns, because of the added precision in measuring the effects of joint venture

announcement on stock returns. The use of daily data permits researchers to take advantage of information about the specific day on which an announcement takes place (Brown & Warner, 1980). Moreover, the use of daily returns minimizes the likelihood that the returns would be influenced by events that are not related to the announcement event (Jensen & Ruback, 1983).

Derivation of Announcement Period Abnormal Returns for the Entire Sample

To test Hypothesis One, the announcement period abnormal stock returns for the entire sample of firms have to be computed. Hypothesis One states that there is a positive relationship between joint venture announcements and parent firms' abnormal stock returns. This hypothesis would be rejected if the announcement period abnormal return for the portfolio of sampled firms was significantly different from zero. The announcement period covers two days, i.e., one day prior to the joint venture announcement date in the Wall Street Journal (day -1) and the announcement date (day 0).

The two-day announcement period, which has been popularly used in the finance literature, was chosen because there is no reason to believe that the accurate date is in fact day -1 for some sample firms (Dodd, 1980). Some of these reported announcements were released to the press during trading hours the day before, and it was expected that any information in the announcements was reflected in the market prices of that day (day -1). Other announcements were, however, released after the close of trading on the day before publication in the Wall Street Journal, and any information in these announcements was reflected in the market prices of day 0. Therefore, the market reaction to the joint

venture announcement seems to be more accurately represented by the announcement period cumulative abnormal returns over days -1 and 0.

The two-day cumulative average abnormal return (CAR) for the entire sample of firms can be derived from an aggregation of abnormal returns of all of the firms to a portfolio over days -1 and day 0. The cumulative average abnormal return can be expressed as:

$$CAR = \sum_{t_0}^{T} AR_{pt} \tag{3}$$

where AR_{pt} = average abnormal returns for the portfolio at day t

t_0 = first relative day in the CAR calculation (day -1)

T = days through which the CAR is calculated (day 0).

The average abnormal returns for the portfolio at day t were obtained by taking an equal-weighted portfolio:

$$AR_{pt} = \frac{1}{N_{pt}} \sum_{j=1}^{N_{pt}} AR_{jt} \tag{4}$$

where AR_{pt} = average abnormal returns for the portfolio at day t

AR_{jt} = average abnormal returns for security j at day t

N_{pt} = number of securities on the portfolio.

A one-tailed one-sample t test was used to test the significance of the announcement period abnormal return. Under the assumption that the capital market reaction to new information is immediate and unbiased, the significantly positive value of announcement period return for the portfolio of sample firms can be interpreted as the significance of positive market reaction to the joint venture announcements.

Analysis of Relationships among Variables: Correlation/Regression Analysis

Correlation Analysis

The interrelationships of all variables included in the present study can be analyzed using a correlation analysis. These variables include: announcement period abnormal returns, parent-child relatedness, parent-parent relatedness, industrial concentration, potential market impact, and firm size. The Pearson correlation coefficient, a statistical summary of the degree and direction of relationship between two variables, can be derived from a correlation analysis. The minimum and maximum values of the correlation coefficient are 0 and 1.0, respectively. The closer the absolute value of correlation coefficients to 1.0, the greater the relationships between the variables. These relationships may be either positive or negative. A positive value suggests that the variables change in the same direction, whereas a negative value suggests that the variables change in different directions.

The relationships between independent and dependent variables were further analyzed through the regression method. The regression analysis is a data analytic system that yields measures of the magnitude of the relationship of an independent variable to the dependent variable (Cohen & Cohen, 1983). The regression analysis was chosen because it has built-in effect size measures that are unit-free and easily understood and communicated (Cohen & Cohen, 1983). The measures of effect size of the magnitude of the phenomenon being studied include, for example, regression coefficients and proportion of variance. These effect size measures come with their significance test value and,

therefore, no confusion between the two issues of "whether" and "how much" need arise (Cohen & Cohen, 1983). That is, the measures of effect size focus on how much relationship the variables have, and the significance test focuses on whether the relationships between variables are statistically significant.

Linear Regression Method

Because a linear regression method focuses on testing the relationship between one independent and one dependent variable, this method was used to test Hypothesis Two, Hypothesis Three and Hypothesis Four. Hypothesis Two focuses on the relationship between parent-child relatedness and parent firms' abnormal stock returns. The regression equation that can be used to test Hypothesis Two can be expressed as:

$$AR = a + b_1 PCR \quad (5)$$

where AR - abnormal stock returns to a sample firm

a - intercept of a regression line

b_1 - regression coefficient for relatedness between parent and child (PCR).

Hypothesis Two would be supported if b_1 was significantly positive, suggesting a positive relationship between parent-child relatedness and parent firms' abnormal stock returns.

Hypothesis Three focuses on the relationship between parent-parent relatedness and parent firms' abnormal stock returns. The regression equation used to test Hypothesis Three can be expressed as:

$$AR = a + b_2 PPR \quad (6)$$

where AR - abnormal stock returns to a sample firm

a - intercept of a regression line

b_2 = regression coefficient for relatedness between parents (PPR).

Hypothesis Three would be supported if b_2 was significantly positive, suggesting a positive relationship between parent-parent relatedness and parent firms' abnormal stock returns.

Hypothesis Four focuses on the relationship between parents-child relatedness and abnormal returns to a group of parent firms unrelated to their child firm. A subsample of parent firms that have zero value of relatedness with their child firm was formed. Differences between the firms in the subsample and their partner in the venture in relatedness with the child were then calculated. The regression equation that was used to test Hypothesis Four can then be expressed as:

$$AR_L = a + b_{L1}\ DPC \qquad (7)$$

where AR_L = abnormal stock returns to a firm in the subsample

a = intercept of a regression line

b_{L1} = regression coefficient for differences between parents in their relatedness with the child (DPC).

DPC represents the difference between two parent firms in the same joint venture in their relatedness with the child. A high value for DPC suggests that parent firms in the same venture greatly differ in their relatedness with the child. On the contrary, a low value for DPC suggests that parents in the same joint venture do not differ much in their relatedness with the child. Hypothesis Four would be supported if b_{L1} was significantly positive. Positive b_{L1} suggests that the higher the differences in parent-child relatedness between parent firms in the same joint venture, the higher the abnormal stock returns the parent firms in the subsample would obtain.

Multiple Regression Method

A multiple regression analysis computes the relationships of one dependent variable with more than one independent variable. This method was used to control for potential confounding variables, which include parent firm size, industrial concentration, potential market impact and specific price-regulated industries. The procedure was that these potential confounding variables were entered into the regression equation, and then the relatedness variables were entered. Potential confounding variables were entered into the equation before relatedness variables so that any of their relationships with the abnormal stock returns can be identified easily. The order of entry of these potential confounding variables was not prespecified because there was no strong theoretical basis that could be used to determine the relative importance of these variables in explaining variance in abnormal stock returns. Various orders of entry were attempted and differences in results were examined. The multiple regression equation can then be expressed as:

$$AR = a + b_1\ MKTIMP + b_2\ CONC + b_3\ SIZE + b_4\ PCR + b_5\ PPR \qquad (8)$$

where AR = abnormal stock returns to a sample firm

a = intercept of a regression line

b_1 = regression coefficient for potential market impact (MKTIMP)

b_2 = regression coefficient for industrial concentration (CONC)

b_3 = regression coefficient for parent firm size (SIZE)

b_4 = regression coefficient for parent-child relatedness (PCR)

b_5 = regression coefficient for parent-parent relatedness (PPR)

The confounding effects of potential market impact, industrial concentration and parent firm size would be indicated by the significant values of b_1, b_2 and b_3, respectively.

Finally, the effects of three price-regulated industries, including electric utility, oil and gas exploration, and oil and gas pipeline transmission, were controlled. This was performed by dividing the entire sample of firms into two groups, i.e., regulated and non-regulated groups. Parent firms in the regulated group are those that participated in joint ventures in the three regulated industries. Parent firms in the non-regulated group, on the other hand, participated in joint ventures in other industries besides these three regulated industries. The announcement period abnormal returns to the firms in each group were regressed on the relatedness and the potential confounding variables. The results obtained from the regression equations were then compared.

CHAPTER FOUR

EMPIRICAL RESULTS

The present study hypothesizes that there is a positive relationship between relatedness among joint venture participants and parent firms' abnormal stock returns. This chapter presents the results of an empirical investigation of the hypotheses proposed in chapter three. The chapter first describes the characteristics of the sample firms and then presents the statistical results of hypotheses testing.

Sample

Sample Characteristics

The screening procedure described earlier in Chapter Three yielded a sample of 209 firms that entered into 209 joint ventures announced during the period 1975-1987. The number of firms and of joint ventures are identical because only one parent firm that met the criteria specified in Chapter Three was randomly selected from each joint venture. The distributions of the sample of joint ventures by year and by industry type are shown in Table 4.

Table 4 consists of two panels. Panel A tabulates the joint ventures by year of first announcement in the Wall Street Journal. During the thirteen-year period of study--1975-1987--the distribution of the joint ventures is skewed toward more recent years than earlier

Table 4

Joint Venture Sample

A. Distribution of Joint Ventures by Year

Year of First Announcement	Number of Joint Ventures
1975	13
1976	8
1977	10
1978	5
1979	4
1980	6
1981	7
1982	20
1983	20
1984	29
1985	17
1986	31
1987	39
	209

B. Distribution of Joint Ventures by Industry

Industry (SIC code)	Number of Joint Ventures
Communications (48)	33
Oil & gas extraction (13)	24
Electric & gas services (49)	23
Electronic & other electric equipment (36)	17
Industrial machinery & equipment (35)	15
Chemical & allied products (28)	13
Real estate (65)	7
Motion pictures (78)	7
Metal mining (10)	5
Rubber & plastic products (30)	5
Fabricated metal products (35)	5
Transportation equipment (37)	5
Instruments & related products (38)	5
Coal mining (12)	4
Construction (15,16)	4
Hotels (70)	3
Food products (20)	2
Printing & publishing (27)	2
Pipelines (46)	2
General merchandise stores (53)	2
Others[a]	26
Full Sample	209

[a]: "Others" contain joint ventures in paper products, furniture, insurance, health services, and other industries.

years. That is, whereas around 25% of the sampled firms entered into joint ventures during 1975-1981, approximately 75% of the sampled firms entered into joint ventures during 1982-1987. These figures suggest a growing trend of joint ventures over time.

Panel B of Table 4 presents the joint ventures distributed by industry, of which two-digit SIC code is in the parenthesis. The industries containing the largest number of joint ventures are communications, followed by oil and gas extraction, electric gas and services, electronic equipment, and industrial machinery and equipment. Joint ventures in these five industries represent around 54% of the entire sample.

Descriptive Statistics and Intercorrelations of Variables

Table 5 presents means, standard deviations, and a correlation matrix of six variables. The entire sample of firms' mean cumulative abnormal return during the announcement period is equal to 0.516%. The positive value of this abnormal stock return suggests that the parent firms' stockholders obtain value gains approximating the announcement event. The mean values of two measures of relatedness--parent-child and parent-parent relatedness--are 58.34% and 36.70%, respectively. These figures indicate that the sampled parent firms were, on average, more related to their child than to their partners. The joint ventures entered by these sampled firms were in the industries whose level of concentration averaged 39.42%. The child industries had sales revenues that were, on average, less than the sales revenues of the parent firms. This is indicated by the value of 3.11 for potential market impact, which is the proportion of the parent firms' sales revenues relative to

Table 5

Descriptive Statistics and Correlation Matrix for Variables

Variables	Means	SD	(1)	(2)	(3)	(4)	(5)	(6)
(1) Announcement period CAR	.516%	3.30	1.00					
2) Parent-child relatedness	58.34%	37.18	.336***	1.00				
(3) Parent-parent relatedness	36.70%	39.50	.055	.525***	1.00			
(4) Concentration	39.42%	18.31	.089	-.058	-.10	1.00		
(5) Potential market impact	3.11	14.95	-.177*	.095	.113	.196+	1.00	
(6) Size ($M)	3103.67	6879.51	-.017	.006	-.060	.050	.172+	1.00

+ p<.10. * p<.05. *** p<.001.

the child industry's sales revenue. Finally, the average parent firm size, as indicated by the average market value of the firms' outstanding stocks at year end prior to the joint venture announcement, is $3103.67 million. This relatively large size of the firms comes about probably because the sample includes several of the largest companies listed on the two major stock markets, including International Business Machines and General Electric.

The correlation matrix shows that the announcement period abnormal stock return correlates significantly with parent-child relatedness (r=.336). The positive value of the correlation coefficient indicates that the announcement period abnormal return increases with an increase in parent-child relatedness. The announcement period abnormal return also correlates significantly with potential market impact (r=-.177). The negative value of the correlation coefficient indicates that the announcement period abnormal return decreases when the parent firms had larger proportion of sales revenues relative to those of the child industry. The correlation coefficient between the two independent variables, i.e., parent-child and parent-parent relatedness, is significantly positive (r=.525). This correlation value suggests the potential problem of multicollinearity between the two independent variables. Finally, among the potential confounding variables, potential market impact correlates significantly with parent firm size (r=.172) and industrial concentration (r=.196). These figures indicate that the parent firms with large potential market impact tend to have large market value of outstanding stocks and form joint ventures in more concentrated industries, respectively.

Tests of Hypotheses

Joint Venture Announcements and Abnormal Stock Returns for the Entire Sample: Empirical Results

Hypothesis One focuses on the relationship between joint venture announcements and abnormal stock returns for the entire sample of parent firms. This hypothesis states that: Joint venture announcements are positively correlated with parent firms' abnormal stock returns. The examination of this hypothesis provides a check of whether the set of firms for this study exhibit positive abnormal stock returns; a finding reported in prior research (e.g., McConnell & Nantell, 1985; Koh & Sinha, 1990; Woolridge & Snow, 1990).

Estimated changes in the entire parent firms' abnormal stock returns associated with the joint venture announcements are presented in Table 6. Column (1) identifies the day relative to the event day zero, the joint venture announcement day; Column (2) presents the cumulative average abnormal stock returns over every two-day interval during the test period; Column (3) presents the percentage of firms with positive two-day abnormal stock returns; and Column (4) presents the cumulative average abnormal returns during the test period.

Column (2) shows that the two-day announcement period (day -1,0) cumulative average abnormal return for the entire sample of firms is 0.516%. A one-tailed t test of this abnormal return was performed. The t test yielded a statistic of 2.26, suggesting that the parent firms' abnormal stock return was significantly different from zero at $p<.05$ level of significance. As the market model (Fama, 1976) suggests, a significant deviation of abnormal stock return from zero around any announcement event could be caused by market adjustment to the flow

Table 6

Summary of Abnormal Stock Returns Surrounding the Announcements of Joint Ventures[a)]

(1) Day	(2) Two-day cumulative average abnormal return	(3) Percent positive two-day average abnormal return	(4) Test period cumulative average abnormal return
-20	0.155%	49.8%	0.155%
-18	-0.050	48.3	0.105
-16	0.045	50.7	0.150
-14	-0.002	46.4	0.148
-12	0.431	51.7	0.579
-10	0.099	54.6	0.678
-8	0.033	48.8	0.711
-6	0.116	48.3	0.827
-4	-0.031	50.2	0.796
-2	-0.059	36.8	0.737
0	0.516%	57.0%	1.253%
2	0.064	45.9	1.317
4	-0.195	45.9	1.122
6	0.058	52.2	1.180
8	-0.052	47.4	1.128
10	0.166	45.0	1.294
12	0.067	48.3	1.361
14	0.178	49.8	1.539
16	0.096	50.7	1.635
18	0.083	49.3	1.718
20	-0.258	45.9	1.460

[a)] Full sample, $\underline{N}$ = 209

of announced information that is specific to the firm. Based on this perspective, the significant deviation of the abnormal stock return from zero around the joint venture announcement date suggests that the capital market adjusted to this announcement. In other words, the joint venture announcements had effects on the parent firms' abnormal stock returns, and these effects were positive. Therefore, Hypothesis One was supported.

This finding is not due to a few outlier observations. None of the observations have standardized residuals greater than +3 or -3. Additionally, 119, or 57%, of the two-day CARs during the announcement period are positive. Column (4) shows that between day -20 to day 0 and day -2, CARs grew from 0.155 to 1.253% and to 1.317%, respectively. Between day 0 and day 10, CARs declined a mere 0.247%, suggesting moderately persistent effects of the joint venture announcements during this period.

Empirical support for Hypothesis One suggests that the firms sampled in this research share some characteristics with firms sampled in previous research. Such similarity strengthens the possibility that the findings of this study can be generalized to other joint ventures not included in this study's sample.

Parent-Child Relatedness and Parent Firms' Abnormal Stock Returns: Empirical Results

A linear regression method was used to test Hypothesis Two, which states that: Parent firms that are more related to their child obtain higher abnormal stock returns than parent firms that are less related to their child. The two-day announcement period abnormal stock

returns for 209 parent firms entering into joint ventures during the period 1975-1987 were regressed on parent-child relatedness. Table 7 displays the regression results, including F-value, regression coefficient, R^2 and adjusted R^2, for parent-child relatedness variable.

Because the F-value for the equation is significant, this suggests a linear relationship between parent-child relatedness and parent firms' abnormal stock returns. The regression coefficient for parent-child relatedness is .336, and is statistically significant at $p<.001$ level, suggesting that the second hypothesis is strongly supported. This .336 value can be interpreted that, as parent-child relatedness increases by 1%, the abnormal stock return for the parent firm increases by 0.336%. The proportion of variance in abnormal stock returns explained by parent-child relatedness is equal to .113, the value of R^2. The value of adjusted R^2, which provides a more realistic estimate of the population value than R^2, is equal to .109.

Table 7

Results from the Regression of Announcement Period Abnormal Returns on Parent-Child Relatedness[a)]

Variable	Regression Coefficient	T-statistics
Parent-child relatedness	.336***	5.085
Constant	-1.223**	-3.035
R^2	.113	
Adjusted R^2	.109	
F	25.85***	
N	209	

a) Regression equation (5) from Chapter Three: AR = -1.223**+.336*** PCR
** p<.01. *** p <.001.

Parent-Parent Relatedness and Parent Firms' Abnormal Stock Returns: Empirical Results

A linear regression method was used to examine Hypothesis Three, which states that: Parent firms that are more related to their partners obtain higher abnormal stock returns than parent firms that are less related to their partners. Table 8 displays the regression results, including F-value, regression coefficient, R^2 and adjusted R^2, for parent-parent relatedness variable.

Because the F-value for the equation is not statistically significant, this suggests no linear relationship between parent-parent relatedness and parent firms' abnormal stock returns. The regression coefficient for parent-parent relatedness also is not statistically significant and this suggests insignificant relationship between parent-parent relatedness and parent firms' abnormal stock returns. Hypothesis Three was, therefore, not supported. The value of R^2, which indicates the proportion of variance in abnormal stock returns explained by parent-parent relatedness, is approximately zero. Similarly, the value of adjusted R^2 is approximately zero.

Table 8

Results from the Regression of Announcement Period Abnormal Stock Returns on Parent-Parent Relatedness[a)]

Variable	Regression Coefficient	T-statistics
Parent-parent Relatedness	.055	.754
Constant	.339	1.04
R^2	.003	
Adjusted R^2	- .002	
F	.568	
N	209	

a) Regression equation (6): AR = .339+.055 PPR

Differences in Parents-Child Relatedness and Parent Firms' Abnormal Stock Returns: Empirical Results

Hypothesis Four states that: Among parent firms that are unrelated to their child, the parent firms whose partners are more related to their child obtain higher abnormal stock returns than the parent firms whose partners are less related to the child. A subsample of parent firms that have zero value of relatedness with their child was formed. This subsample contains 22 parent firms. Differences between the parent firms in the subsample and their partner in relatedness with the child were then calculated. Next, the abnormal stock returns to the parent firms in the subsample were regressed on the differences between parent firms in their relatedness with the child. Table 9 displays the regression results, including F-value, regression coefficient, R^2 and adjusted R^2.

Because the F-value for the regression equation is significant, this suggests that the differences between parent firms in their relatedness with the child and the abnormal stock returns to the parent firms in the subsample has a linear relationship. The regression coefficient for differences in parents-child relatedness is significantly positive at $p<.10$ level of significance, suggesting that Hypothesis Four is moderately supported. The value .425 of this regression coefficient can be interpreted that as the difference between the parent firms in their relatedness with the child increases by 1%, the abnormal stock return to the parents that are unrelated to their child increases by .425%. The value of R^2, or the proportion of variance in parent firms' abnormal stock returns explained by differences in parents-child relatedness, is .181. The value of

adjusted R^2 is .13.

Table 9

Results from the Regression of Announcement Period Abnormal Stock Returns on Differences in Parents-Child Relatedness[a)]

Variables	Regression coefficient	T-statistics
Differences in Parents-Child Relatedness	.425^{+}	1.88
Constant	-5.430*	-2.18
R^2	.181	
Adjusted R^2	.130	
F	3.534^{+}	
n	22	

[a)] Regression equation (7): $AR_L = -5.43^{*} + .425^{+}$ DPC

$^{+}$ $p<.10$. * $p<.05$.

Controlling for Potential Confounding Variables

This study controls for the effects of four variables: potential market impact, the concentration of the child industry, parent firm size, and price-regulated industries. The approach used to control for the first three variables was to enter these variables into the regression equation that has parent firms' abnormal stock returns as a dependent variable. There was no prespecified order of entry for these three variables because no strong theory regarding the relative importance of these variables for firms' performance could be identified. When the regressions were computed specifying various other orders of entry of the three variables, however, no appreciable difference in results was found.

Parent-child relatedness was entered next into the regression equation so that changes in R^2 and adjusted R^2 could be determined. Parent-parent relatedness was not included in the equation because it

has high multicollinearity with parent-child relatedness, and it has insignificant relationship with the abnormal stock returns. The regression results are presented in Table 10.

Table 10 arrays the values of regression coefficients, R^2, R^2 change and adjusted R^2, as the variables were entered cumulatively into a regression equation. The relationships between parent-child relatedness and parent firms' abnormal stock returns do not appear to be significantly affected by the child industry's concentration or parent firm size because these two variables do not have statistically significant relationships with parent firms' abnormal stock returns. The relationships between parent-child relatedness and parent firms' abnormal stock returns appear to be moderately affected by potential market impact, which has a significant relationship with abnormal stock return at $p<.10$ level of significance. Potential market impact can, however, explain slight variance in parent firms' abnormal stock returns because the value of adjusted R^2, when only potential market impact was in the equation, was .013.

The procedure used to control for the effects of the three price-regulated industries on parent firms' abnormal stock returns began with the division of the entire sample of 209 firms into two subsamples: regulated and non-regulated. The regulated subsample consists of 33 parent firms that entered into joint ventures in the three regulated industries, i.e., electric utility, oil and gas exploration and oil and gas pipeline transmission; the non-regulated subsample consists of 176 parent firms that entered into other industries. The descriptive statistics for the regulated and non-regulated subsample are displayed

Table 10

Results from the Regression of Announcement Period Abnormal Stock Returns on Relatedness and Potential Confounding Variables[a)]

Variables	Regression coefficients	T-statistics	R^2	R^2 change	Adjusted R^2
Potential market impact	-.234^{+}	-1.740	.032	.032	.013
Industrial concentration	.146	1.109	.048	.016	.011
Parent firm size	.005	.037	.048	.000	-.009
Parent-child relatedness	.437*	2.893	.181	.133	.116
Constant	-2.20^{+}	-1.806			
F		2.768**			
N		209			

[a)] Regression equation (8): AR = -2.20^{+} -.234^{+} MKTIMP +.146 CONCEN +.005 SIZE +.437* PCR

$^{+}$ $p<.10$. * $p<.01$. ** $p<.05$.

in Table 11.

Table 11 consists of two panels. Panel A arrays the descriptive statistics of abnormal stock return, relatedness, and three potential confounding variables, for the two subsamples and for the full sample. Panel B displays the results of two-sample t tests that were used to examine differences in the groups on the variables included in Panel A of the table.

The t-test results indicate that the abnormal stock returns for the three groups are not significantly different. At the approximately similar levels of announcement period abnormal stock returns, however, the regulated subsample has higher level of parent-child and parent-parent relatedness than the non-regulated subsample or the full sample, and these differences are statistically significant. These results hence suggest that, on average, high relatedness between parent and child or between parents does not lead to as high positive abnormal stock returns to the firms entering into joint ventures in the three regulated industries as those to the firms entering into joint ventures in other industries.

The next stage used in controlling for the effects of the three regulated industries was to run the regression analyses for the regulated and non-regulated subsamples. Announcement period abnormal stock returns to the parent firms in these two subsamples were regressed on relatedness and potential confounding variables. The results are

Table 11
Comparison between Regulated, Non-regulated Subsamples and Full Sample

(A) Descriptive Statistics

Variables	Regulated subsample (n=33)	Non-regulated subsample (n=176)	Full sample (N=209)
Dependent Variables			
Two-day announcement period abnormal return			
Means	.49	.52	.52
SD	2.15	3.48	3.30
Independent variables			
Parent-child relatedness			
Means	82.35	54.28	58.34
SD	31.29	36.62	37.18
Parent-parent relatedness			
Means	59.27	35.06	38.70
SD	46.30	37.15	39.50
Potential Confounding Variables			
Potential market impact			
Means	8.72	1.86	3.11
SD	34.26	3.87	14.95
Concentration			
Means	N.A.	39.42	39.42
SD	N.A.	18.31	18.31
Parent firm size			
Means	1312.95	3103.67	3103.76
SD	1930.81	6879.51	6879.51

(B) T-statistics for Differences in Variables

Differences between	Regulated and non-regulated	Regulated and full sample	Non-regulated and full sample
Two-day announcement period abnormal stock return	.06	-.05	.01
Parent-child relatedness	-4.64***	4.02***	-1.13
Parent-parent relatedness	-2.80**	2.39*	-.94
Potential market impact	-.92	-2.17*	-2.23*
Concentration	N.A.	N.A.	.00
Parent firm size	2.75**	-2.75**	.00

N.A. => Information for the sample not available
* p<.05. ** p<.01. *** p<.001.

presented in Table 12. Table 12 consists of two panels, i.e.,Panel A and B, which present the regression results for the regulated and non-regulated subsamples, respectively. The regression coefficient for parent-child relatedness is -.087 for the regulated subsample, compared with .484 for the non-regulated subsample, or .437 for the full sample. These figures suggest that the regulated industries mitigated the relationship between parent-child relatedness and parent firms' abnormal stock returns. This is indicated by the increase in: the regression coefficient for parent-child relatedness from .437 to .484, R^2 from .181 to .197, and adjusted R^2 from .116 to .133, after the regulated subsample was excluded from the full sample,.

The three price-regulated industries also affect potential market impact. In other words, interaction exists between price-regulated industries and potential market impact. The regression coefficient for potential market impact, which was statistically significant for the full sample, became statistically insignificant after the regulated subsample was excluded from the full sample.

In summary, only one potential confounding variable--specific regulated industries--had confounding effects on the relationships between relatedness among joint venture participants and parent firms' abnormal stock returns. Regulated industries also interact with potential market impact, that is, they lead to the significant effects of potential market impact when their effects are not controlled for.

Table 12

Regression Results for Regulated and Nonregulated Subsamples

A. Regression Results for Regulated Subsample[a)]

Variables	Regression Coefficients	T-statistics	R^2	R^2 change	Adjusted R^2
Potential market impact	-.536	-1.785	.289	.289	.225
Industrial concentration	N.A.	N.A.	N.A.	N.A.	N.A.
Parent firm size	.150	.509	.312	.023	.175
Parent-child relatedness	-.087	-.260	.320	.008	.093
Constant	1.062	.603			
F		1.411			
n		33			

N.A. => Information not available

[a)] Regression equation (8): AR = 1.062 -.536 MKTIMP +.15 SIZE -.087 PCR

B. Regression Results for Non-regulated Subsample[a)]

Variables	Regression Coefficients	T-statistics	R^2	R^2 change	Adjusted R^2
Potential Market Impact	-.164	-1.219	.022	.022	.003
Industrial concentration	.130	1.008	.035	.013	-.002
Parent Firm Size	-.019	-.148	.035	.000	-.021
Parent-Child Relatedness	.484**	3.292	.197	.162	.133
	(.437)*	(2.893)	(.181)	(.133)	(.166)
Constant	-2.113+	-1.717			
F		3.063**			
n		176			

Note Figures in parentheses are for the full sample

[a)] Regression equation (8): AR = -2.133+ -.164 MKTIMP +.13 CONCEN -.019 SIZE +.484** PCR

+ p<.10. * p<.01. ** p<.05.

Summary

This chapter presents the results of testing the following hypotheses:

H1: Joint venture announcements are positively correlated with parent firms' abnormal stock returns. This hypothesis was supported.

H2: Parent firms that are more related to their child obtain higher abnormal stock returns than parent firms that are less related to their child. This hypothesis was strongly supported.

H3: Parent firms that are more related to their partners obtain higher abnormal stock returns than parent firms that are less related to their partners. This hypothesis was not supported.

H4: Among parent firms that are unrelated to their child, the parent firms whose partners are more related to their child obtain higher abnormal stock returns than the parents whose partners are less related to the child. This hypothesis was moderately supported.

CHAPTER FIVE

DISCUSSION, IMPLICATIONS AND CONCLUSIONS

The purpose of this study is to examine the relationship between joint venture announcements and parent firms' abnormal stock returns. This study assumes that relationships across joint ventures are not homogeneous and hypothesizes that relatedness among joint venture participants affects parent firms' stock returns. This chapter first discusses the empirical findings and then provides their implications. Limitations of this study, suggestions for future research along with conclusions also are presented.

Discussion

Hypothesis One

Hypothesis One posits a positive relationship between joint venture announcements and parent firms' abnormal stock returns. Empirical support in this study of this hypothesis is consistent with the findings from prior studies (e.g., McConnell & Nantell, 1985; Woolridge & Snow, 1990). These findings share the suggestion that joint ventures are value-creating activities for stockholders of parent firms. That is, the capital market perceives that investment decisions, such as joint ventures, enhance a firm's ability to generate future cash flow (Rappaport, 1986). The capital market, therefore, responds to joint

venture announcements by showing higher market valuation for the parent firms approximating the joint venture announcement event.

Another interpretation of the capital market's positive reaction to joint venture announcements is that the market expects joint ventures to generate competitive advantages for parent firms. For instance, the capital market might perceive that a joint venture enables a parent firm to become a low-cost producer, whose strength is low cost, or a differentiator, whose products/services are perceived as unique by the buyers (Porter, 1980, 1985). Similarly, the capital market might perceive that a joint venture enables a firm to erect entry barriers to new entrants and hence could sustain the firm's competitive advantages.

The finding that the CARs for the parent firms are still high over twenty-day period after the announcement date suggests moderately persistent effects of the joint venture announcements during the period. However, because this study does not examine the CARs beyond the twenty-day period after the announcement date, the study cannot indicate the period that the effects of the joint venture announcements would last. One prior joint venture study (McConnell & Nantell, 1985), however, reports that the announcement effects are evident 60 trading days after the announcement date, and beyond this point there is no further systematic valuation effect.

The mitigating effects of joint venture announcements may not conflict with management's long-term goal of stockholder value maximization. This is because the initial announcement of a joint venture can be considered as one event in a series of moves constituting joint venture activities. The declining effects of the joint venture announcements may occur because the capital market anticipates a further

move in a series of joint venture activities such as a starting operation by a joint venture firm, after which the persistent effects of the joint ventures on stockholder value may occur.

Hypothesis Two

The finding of the significant, positive relationships between parent-child relatedness and parent firms' abnormal stock returns lends support to Hypothesis Two. This finding suggests that investors in the stock market, on average, form expectations about future income streams generated by joint ventures based on similarities between parent and child firms in their product/market areas. Such positive relationships occur for joint venture participants in various types of industries. Exceptions include joint ventures in oil and gas exploration, oil and gas transmission and electric utility industries, where no such positive relationship was found.

The confirmation of Hypothesis Two can be interpreted as a justification for the theory underlying this hypothesis. The theory proposes that the capital market perceives the association between high parent-child relatedness and distinctive advantages, which are not associated with low parent-child relatedness. The capital market might perceive that high parent-child relatedness enables a share between parent and child firms in specialized resources/skills used in production or marketing, and this leads to the distinctive advantages that cannot be obtained if parent and child firms are less related. These distinctive advantages are, for example, lowered average costs in production or marketing functions, which, in turn, implies higher future income streams for the parent firms.

A corollary of the theory suggests that the stock market perceives the association between low parent-child relatedness and distinctive disadvantages. The stock market might perceive that low parent-child relatedness leads to high costs that are unlikely to occur if parent and child firms are highly related. These costs include, for example, investment costs in plants or production technology, learning costs and entry costs.

The relation between parent-child relatedness and parent firms' abnormal stock returns diminishes in regulated industries. The capital market does not react positively to joint venture announcements in oil and gas exploration, oil and gas transmission and electric utility industries probably because the market does not perceive specific advantages associated with high relatedness or specific disadvantages associated with low relatedness. High parent-child relatedness in these industries may not suggest parent firms' ability to control factors that lead to distinctive advantages for the firms. These factors include, for example, investment costs and product price. High parent-child relatedness in regulated industries may not suggest low investment costs for the parent firms. The parent firms that are 100% related to their child and are in the regulated subsample have varied investment costs, ranging from $4 million to $1.3 billion, and have the average cost of $203 million. High parent-child relatedness in regulated industries also does not suggest that parent firms can control product prices because the prices are determined by regulatory agencies. High parent-child relatedness in regulated industries, therefore, does not lead to market expectation of parent firms' low investment costs or parent firms' power to control market price.

Hypothesis Three

Hypothesis Three was not supported because there was no statistically significant relationship between parent-parent relatedness and parent firms' abnormal stock returns. The interpretation of this finding is that higher similarities between parent firms in their product/market areas do not suggest greater advantages than lower similarities. High parent-parent relatedness suggests that parent firms possess similar specialized resources because they operate in similar product/market areas. A joint venture between firms that are highly related may enable the parent firm to supplement its specialized resources with the resources of its partner. This may lead to better utilization of resources, and hence lowered average costs for the parent firm.

In a similar vein, low parent-parent relatedness may suggest to the capital market that the parent firms can better utilize their resources. Low parent-parent relatedness suggests that parent firms possess dissimilar specialized resources because they operate in different product/market areas. A joint venture between firms that have low relatedness may enable the parent firm to complement its resources with the partner's resources. The complement of resources may enable the parent firm to better utilize its resources, and hence lower its average costs.

Examples of the joint ventures that are consistent with the above discussion can be provided. Two sampled joint ventures will be discussed: a joint venture between Mitel Corp. and American Satellite Company, announced 12/14/82; and a joint venture between MCA and IBM, announced 9/6/79. The sampled parent firms from these two joint

ventures are Mitel and MCA. Mitel's products were telecommunication equipment and integrated circuits used in telecommunication industries, the industries in which American Satellite operated. Mitel and American Satellite were, therefore, 100% related because Mitel's products serve as input for the industries where American Satellite was in. On the other hand, MCA and IBM were 0% related because they operated in different product/market areas and did not have buying-selling relationships. MCA's business concern was video disk, whereas IBM's business was in the field of information handling systems.

The announcement period abnormal returns that Mitel and MCA obtain are 0.041% and 0.046%, respectively. Because these returns are not statistically different, this suggests that a firm that is 0% related to its partner can obtain as high abnormal stock return as a firm that is 100% related to its partner. The joint venture between Mitel and American Satellite to provide a telecommunication carrier to businesses may suggest a great opportunity for these two firms to supplement their resources with those of the partner. As the news in the Wall Street Journal stated: "...The [telecommunication] carrier will combine American Satellite's satellite transmission capability with Mitel's telecommunication switching technology." On the other hand, the joint venture between MCA and IBM to manufacture and market disks for consumer and industrial markets may suggest a great opportunity for these two firms to supplement their resources with those of the partner. The joint venture announcement in the Wall Street Journal states that IBM would contribute patents and technology from its own exploration of video disks, plus an undisclosed amount of cash. IBM's contributed resources could, therefore, complement MCA's resources. IBM also could

benefit from this joint venture because it could expand industrial and educational markets for video disks. The examples indicate that a joint venture between related parent firms or between unrelated parent firms suggests better utilization of resources, the advantage of which carries similar weight for high or low parent-parent relatedness. This then explains the finding of no positive relationship between parent-parent relatedness and parent firms' abnormal stock returns.

The finding of significant correlation (r=.525) between the independent variables--parent-child relatedness and parent-parent relatedness--suggests that each independent variable is at least partly carrying information about the parent firms' abnormal stock returns that is also supplied by the other. High parent-child relatedness may carry the notion that parent and child firms can share specialized and general resources, which, in turn, leads to lowered average costs. Similarly, high parent-parent relatedness may carry the notion that parent firms can share specialized resources, which, in turn, leads to lowered average costs. The notion of lowered average costs carried by high parent-child relatedness or high parent-parent relatedness is thus redundant.

In spite of the partially redundant information, parent-child relatedness or parent-parent relatedness also carries the information that is not redundant. High parent-child relatedness carries the notion that parent and child firms can share specialized resources, the advantage that may not be obtained by low parent-child relatedness. High parent-parent relatedness, on the other hand, carries the notion that the parent firms can obtain supplementary resources. The capital market may perceive that this advantage carries similar weight to the

advantage associated with the acquisition of complementary resources, which tends to occur when there is low parent-parent relatedness. Based on this logic, the capital market tends to rely on parent-child relatedness when it determines the value of joint ventures because the additional information carried by parent-child relatedness can indicate the distinctive advantages associated with high relatedness, but not with low relatedness. On the contrary, the additional information carried by parent-parent relatedness cannot indicate the distinctive advantages associated with either high or low parent-parent relatedness. This explanation is consistent with the findings of significant relationship between parent-child relatedness and parent firms' abnormal stock returns, but nonsignificant relationship between parent-parent relatedness and parent firms' abnormal stock returns.

A conclusion is that parent-child relatedness is more relevant in explaining variance in parent firms' abnormal stock returns than parent-parent relatedness. Parent-parent relatedness is more like a peripheral variable because it partly carries redundant information with parent-child relatedness, and the additional information that it carries cannot indicate differences in advantages associated with high or low parent-parent relatedness.

Hypothesis Four

The finding of the statistically significant, positive relationship between differences in parents-child relatedness and abnormal stock returns for parent firms that are unrelated to their child lends support to Hypothesis Four. This finding suggests that relatedness between one parent and child can provide advantages that

compensate for disadvantages associated with unrelatedness between the other parent and child. This is an important finding which adds to theoretical notions concerning relatedness. That is, the capital market does not always react negatively to unrelatedness between parent and child. If there is a combination of parent-child relatedness and parent-child unrelatedness, the disadvantages associated with parent-child unrelatedness can be mitigated.

An example of the sampled joint venture that is consistent with the postulation of Hypothesis Four can be provided. In the joint venture between Gillette Co. and Williamson, Ariedge & Richards, Inc., announced 3/30/83, one parent firm was related to the child while another parent firm was not. Gillette was a producer of razors, blades, grooming aids and writing instruments. Williamson, Ariedge & Richards, Inc., was a closely held oil and gas exploration and development concern. These two companies entered into an oil and gas exploration joint venture with the investment value at about $3.8 million. Gillette and the joint venture child were 0% related because they operated in different business segments. Williamson and the child, on the other hand, was 100% related because they were engaged in the same business segment. The capital market reacted positively to Gillette's decision because it might perceive that though Gillette was not related to the child, its partner or Williamson was. Williamson had specific resources/skills necessary for oil and gas exploration and this could compensate for Gillette's lack of these resources. On the other hand, from Williamson's point of view, the firm would still benefit from this joint venture because Gillette could provide general resources such as financial resources required for the venture.

Implications

The empirical findings in this study lead to several implications. One implication is that not all joint ventures are homogeneous in their effects on stock returns. Relatedness between parent and child might differ across joint ventures and this leads to different reactions from the capital market to joint venture announcements. Joint ventures, therefore, should not all be perceived as similar. A more fine-grained approach that considers different aspects of joint ventures should be used when conducting a study on joint ventures.

Another implication is that it is possible to generalize the concept of relatedness from merger/acquisition studies to joint venture studies. The theoretical notion regarding specific advantages associated with relatedness proposed by several diversification studies (e.g., Hill & Hoskisson, 1987; Singh & Montgomery, 1987) can be applied to joint venture studies. This theoretical argument can explain the empirical findings of the relationships between relatedness and firms' performance in a number of diversification studies and this joint venture study. That is, higher relatedness accounts for better performance of firms. And because of the compatibility in findings between joint venture and merger/acquisition studies, this implies that, to some extent, investors in the capital market used similar logic to determine the value of joint ventures and mergers/acquisitions.

The findings from this study also have implications for practitioners. One implication for management is that managers may consider a joint venture formation as one approach that can help them increase the stockholder value. A firm with a market value of $3

billion, for example, can increase its market value by $16.05 million over the two-day announcement period, of which the cumulative average abnormal return is 0.517%. This increase in stock market value associated with the joint venture announcements also was found to be greater than the increase in stock market value associated with other strategic investment decisions. Woolridge and Snow (1990), for example, found that joint venture announcements led to a greater increase in stock market value than other investment announcements, such as internal product/market diversification or capital expenditure, including plant modernization or capacity expansion. Therefore, a joint venture formation seems to be one viable approach that enables management to increase stockholder value.

Another implication for management is that there is more than one approach for management to increase the firm's stockholder value associated with a joint venture formation. Forming a joint venture in related product or market areas is just one approach. Another approach is that management forms a joint venture in unrelated product or market areas with a partner firm that is related in product or market areas to the child firm. This approach can be beneficial for both parent firms. The parent firm that is unrelated to the child firm can fulfill its goal of diversifying business into different product or market areas through the child's business. This parent firm also can lessen its disadvantages associated with unrelatedness to the child because its partner tends to have specific resources/skills required by the child. The parent firm that is related to the child also can benefit from this joint venture because its partner may possess resources/skills that it is lacking.

This study also has an implication for stockholders. Stockholders of firms that announce joint ventures may obtain high value gains if they immediately sell their stocks, either on the announcement day or within several days after the announcement day. This study found that the cumulative average abnormal returns for the parent firms peaked during the two days after the announcement day and remained moderately high over twenty-day period after the announcement date. Therefore, stockholders who need to obtain value gains from joint venture announcements are suggested to act immediately after the announcements.

Study Limitations/ Suggestions for Future Research

Several limitations in this study provide issues for future research. First, the dependent variable in this study is abnormal stock return, which is market-based performance because it reflects the performance of firms evaluated by investors in the capital market. Other performance measures may be used in future research to verify the relationship between relatedness among joint venture participants and parent firms' abnormal stock returns. Examples include accounting-based measures such as return on investment, net profits or sales growth.

Second, the measure of relatedness in this study was developed based on Shelton's (1988) approach of using one measure to indicate product and/or market relatedness. Firms may be related either through products or markets. Product relatedness and market relatedness were, therefore, given equal weights in the calculation of measure of relatedness in this study. However, it is possible that the stock market does not assign equal weights to product relatedness or market relatedness. Future research may, therefore, measure product

relatedness and market relatedness separately so that the relationship of each with parent firms' performance can be determined. Prior studies on acquisitions such as Capon et al. (1988) and Palepu's (1985) may be helpful about this issue. This is because the former study develops a measure of market relatedness, whereas the latter study develops a measure of product relatedness.

In addition to the classification of relatedness by products or markets, relatedness may be classified by horizontal or vertical relationships among firms. Firms that have horizontal relationships are those that compete in the same product/market areas. Firms that have vertical relationships are engaged in the same product lines and have buying-selling relationships. Because studies on a relationship between horizontal joint venture and firms' performance are more prevalent (e.g., Duncan, 1982, Koh & Sinha, 1990), future research may, therefore, focus on a relationship between vertical joint venture and firms' performance. Additionally, a comparison between the effects of horizontal and vertical joint ventures on accounting-based performance or market-based performance may be investigated.

Third, this study samples joint ventures, each of which consists of only two parents. A joint venture consisting of more than two parents may, however, be sampled and examined because the number of parent firms and their linkage may have some effects on firms' performance. Koh and Sinha (1990), for example, argue that a horizontal joint venture consisting of a greater number of parents is less profitable than a venture consisting of a fewer number of parents. Koh and Sinha (1990) argue that when market concentration is high, a joint venture with many parents leads to a small increase in the output of

each parent and this output increase may not be sufficient to compensate for a dropping in price in response to any increase in the output. Each parent in the venture may, therefore, not gain much because of the joint venture formation. To examine the effects of the number of parents firms on the firms' performance, a theoretical notion concerning network (e.g., Thorelli, 1986) or interorganizational linkage (e.g., Sterns, Hoffman & Heide, 1987) may be helpful.

Fourth, this study focuses on the effects of joint venture announcements on parent firms' abnormal stock returns. A joint venture announcement may be considered "intended" strategy (Mintzberg, 1978) because it reflects management's intention to implement a joint venture decision. However, it may be possible that the intended strategy becomes unrealized or is not implemented. Therefore, future research may focus on the effects of joint ventures after they are implemented or become "realized" strategy (Mintzberg, 1978). It would be interesting to determine whether the announcement of joint venture completion leads to a persistent increase in the stockholder value of parent firms. Furthermore, the relation between relatedness among joint venture participants and actual performance of a joint venture child can be another focus of future research.

Finally, with respect to the joint ventures in the three regulated industries, where the relationship between relatedness and stock market responses was not as expected, other predicting variables may be examined. For example, the relationships between investment costs in joint ventures or environmental variables, such as price/cost structure in regulated industries or demand instability (Hofer, 1975), and parent firms' abnormal stock returns may be examined.

Conclusions

Over the past decade, joint ventures have been increasing in popularity. One reason for this popularity may be the expected increase in the value of parent firms. Most of prior studies assume that joint ventures have similar, positive effects on firms. The present study, however, has a different assumption from prior studies. This study assumes that not all joint ventures are homogeneous and then hypothesizes that relatedness among joint venture participants affects parent firms' market performance. The findings in this study lend support to this hypothesized notion. That is, relatedness between parent and child firms could explain variance in parent firms' abnormal stock returns approximating the joint venture announcement event. The more the relatedness between parent and child firms was, the higher the value gains the stockholders of parent firms obtained.

The findings in this study offer insight into relatedness concept. That is, for a group of firms participating in a joint venture, it is insufficient to predict the performance of one parent firm based on only its relatedness to a child firm. Relatedness between the other parent firm and a child has to be considered simultaneously with the relatedness between the former parent and the child. This is because the finding reveals that, from the perception of the capital market, relatedness between one parent firm and a child generates just like spillover in value gains to the other parent firm that is unrelated to the child.

The findings from this study also have several implications for practitioners. This study implies that management have several avenues to increase stockholder value through a formation of joint venture.

Management may increase stockholder value by forming a joint venture in related product or market areas. Alternatively, if management intends to diversify a firm's businesses into different product or market areas through a joint venture, it can still increase the stockholder value by selecting a partner firm that is related to the joint venture child. Management, however, should also be aware that these suggested avenues may not be functional in some exceptional industries, such as oil and gas exploration or electric utility industries. For these particular industries, management are suggested to form their expectations about the effects of joint ventures based on other factors besides relatedness.

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