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Essays on Examining the Risk and Return Effects of Joint Ventures

Tuncer Gocmen

Dissertation submitted to the
College of Business and Economics
at West Virginia University
in partial fulfillment of the requirements
for the degree of

Doctor of Philosophy
in
Economics

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ABSTRACT

Essays on Examining the Risk and Return Effects of Joint Ventures

Tuncer Gocmen

A joint venture is established when two or more firms pool their resources to achieve some objective under the combined management of the parent companies. Joint ventures are an increasingly common and important type of cooperative strategy in today's dynamic markets. The synergy hypothesis states that joint ventures are formed to create synergies resulting from sharing complementary skills and resources and stock markets should react positively to joint venture announcements. Joint ventures are also established to share risk to overcome uncertainty in demand and technology. Previous literature on joint ventures is drawn from the welfare effects of joint ventures. However, there has been a little amount of study on both risk and welfare effects of joint venture announcements on shareholder's wealth. For that reason, this dissertation is entirely dedicated to fill this existing gap in joint venture literature.

In chapter 1, the "standard event study" technique based upon the market model is used to examine the risk, diversification and return effects of domestic joint venture announcements. Total risk is partitioned into systematic risk and unsystematic risk. The overall sample analysis indicates that the systematic risk decreases while unsystematic risk and total risk increase. The same applies to the sub-sample where two parent companies from different industries announce a joint venture in an entirely different industry. There is no significant change in all three risk measures when both parents choose not to diversify. The results for the sub-sample where both parents within the same industry engage in a joint venture in a different industry indicate that the systematic risk decreases while unsystematic and total risks remain the same. Similarly, when a sub-sample is created where one parent is in the same industry as the joint venture, the results for the non-diversifying parent provide evidence that the systematic risk decreases and while there is no change in systematic and unsystematic risks. Finally, the findings for the diversifying parents evidence that unsystematic risk and total risk increase and the systematic risk falls. For all the samples, the estimation results suggest that there is strong evidence that the shareholders of the companies engaged in joint ventures, on average, experience highly significant positive abnormal returns – approximately between 16 percent and 44 percent - at the time of such announcements. These results show returns that are relatively much higher than those found in previous studies.

Chapter 2 aims at finding empirical evidence for the relative size hypothesis in joint venture announcements involving only two firms that differ in their sizes for the period of 1981 to 2002. Market capitalization and abnormal returns based on the market model methodologies are utilized. Each firm in the sample is categorized as "small", "medium" or "large" firm based upon its market capitalization. The findings support the relative size hypothesis predicts that market reaction to a joint venture announcement is inversely related to firm's size relative to its partner.

The risk analysis of joint ventures between small and large size partners shows that systematic risk for both parents, regardless of their relative size, decreases while unsystematic and total risk levels do not change. Secondly, when the joint venture is between small and medium size parents, the medium size parents benefit from lower level of systematic risk through joint ventures whereas small parents experience no change in systematic risk. Both small and medium size parents do not observe any change in both total and unsystematic risks. Finally, when a sub-sample is formed where medium size firms partner with large firms, medium size firms do not experience any change in all three risk measures while large size firms experience increase in all three measures of the risk.

Chapter 3 studies the impact of industry concentration on the choice of expansion mode between joint ventures and IPOs. The literature related to this study can be partitioned into two groups. The first group focuses on the ownership choice between JV and wholly-owned subsidiary modes of entry. On the other hand, the second group studies the effects of IPO announcements on rival firms within the same industry. However, there has not been any study on the choice of expansion mode between joint ventures and IPOs under different degrees of industry concentration. For this, two different hypotheses are developed and tested: The first hypothesis states that when target industry is highly concentrated, the preferred mode of expansion should be joint venture. The second hypothesis states that when negative competitive effects are stronger than positive information effects, IPO firms will choose highly concentrated industry. This study finds empirical support for the second hypothesis but not for the first one. The empirical findings show that both IPO and joint venture companies tend to choose highly concentrated industries. The welfare effect of both IPO and joint venture announcements on shareholders' wealth is also examined. The findings document that in the longer time period (180 days), cumulative average excess return for IPO firms is significantly greater than cumulative average excess return for joint venture firms.

Chapter 4 concludes the dissertation and provides additional directions for future research.

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Chapter 1. First Essay:
Re-examining the Risk and Return Effects of Joint Ventures:
New Empirical Evidence

Abstract

This study attempts to fill an existing gap in the literature on joint ventures by highlighting risk and return aspects of such cooperative strategies. The sample for this study is composed of companies engaged in domestic joint ventures over the period of 1981 - 2002. The study uses the "standard event study" technique based upon the "market model". For the purpose of risk analysis, total risk is partitioned into systematic risk and unsystematic risk. In order to see if there is any difference in the risk and welfare effects of joint ventures under different joint venture structures, the initial sample is divided into different sub samples based on Standard Industry Classification (SIC) codes of parent companies and the joint ventures. The overall sample analysis indicates that the systematic risk decreases while unsystematic risk and total risk increase. The same applies to the sub-sample where two parent companies from different industries announce a joint venture in an entirely different industry. The analysis for the sample where both parents choose not to diversify shows no significant change in all three risk measures. The results for the sub-sample where both parents within the same industry engage in a joint venture in a different industry exhibit weak evidence that the systematic risk decreases while, with strong evidence, unsystematic risk and total risk remain the same. Similarly, when a sub-sample is created where one parent is in the same industry as the joint venture, the results for the non-diversifying parent provide weak evidence that the systematic risk decreases and strong evidence that there is no change in unsystematic risk and total risk. Finally, the findings for the diversifying parents show strong evidence that unsystematic risk and total risk increase and weak evidence that the systematic risk falls. For all the samples, the estimation results suggest that there is strong evidence that the shareholders of the companies engaged in joint ventures, on average, experience highly significant positive abnormal returns – approximately between 16 percent and 44 percent - at the time of such announcements. These results show returns that are relatively much higher than those found in previous studies. However, average abnormal returns after the day of announcement are mostly negative or not significantly different from zero.

Chapter 1: Re-examining the Risk and Return Effects of Joint Ventures: New Empirical Evidence

1. Introduction

A joint venture is a way of combining resources to achieve some objective. Two or more parent companies pool their resources to accomplish that objective (described henceforth) under the combined management of the parent companies. It is a new legal entity owned by two or more parent firms. In this regard, joint ventures are different from corporate mergers. Management under the joint venture differs from that of the parent firms - the original management of the parent firms remains intact under the joint venture. While mergers join two firms together, joint ventures create entirely new entities (McConnell and Nantell, 1985).

Joint ventures are an increasingly common and important type of cooperative strategy in the domestic and international business arena. Brodley (1982) lists some of the reasons for forming joint venture agreements: to achieve cost savings, to alter industry conduct, and to restructure production in ways profitable to the parent firms. McConnell and Nantell (1985) emphasize different motives for establishing joint ventures and group them under “synergistic” gains resulting from sharing complementary skills and resources. They are as following: 1) Risk sharing to overcome uncertainty in demand and technology 2) Achieve economies of scale in production 3) augmented market power 4) enhanced marketing and product distribution techniques 5) Reallocation of assets to more profitable uses.

Hennart (1991) mentions further instances where joint ventures can be advantageous; the first is when a joint venture is a diversification strategy for the parent.

This happens when a joint venture operates in a different market from that of the parent firm. In this case, the parent may find that intermediate inputs needed to venture into a new industry are held by another parent, are difficult to acquire by contract, are costly to replicate, and are therefore most efficiently obtained through a joint venture. Secondly, for the case of international joint ventures, a firm that enters a foreign market for the first time is also likely to opt for a joint venture. This is because such a firm will lack the knowledge of local conditions. Thirdly, firms may also engage in joint ventures to obtain access to resources that are controlled by other firms. This is likely to be the case in natural resource industries where government policies discourage or forbid full ownership by international companies. Finally, joint ventures are used to combine complementary inputs held by two separate firms, when the market for both of these inputs has high transaction costs. In another study, Hennart (1988) argues that joint ventures are efficient and should be the preferred mode of cooperative strategy when two conditions are met at the same time: (1) imperfect intermediate goods (know-how, raw materials, parts and machinery etc.) market where parent firms operate; (2) purchase or reproduction of the resources that used in the production of those goods is more costly than procurement of the right to use the same under the joint venture agreement. In case of market failure for intermediate goods, being co-owner in the new entity will help reduce or eliminate parent firms' incentive to deviate from their objective set by joint venture agreement. The seller of the intermediate goods will have less incentive to take advantage of the buyer by increasing prices or lowering the quality of the goods. Therefore, joint venturing can lower the transaction cost of pooling intermediate inputs into the production process. Also, acquiring the resources is less efficient than having the

right to use them through joint ventures when the required assets for use in the production process cannot be separated from non-required ones (Hennart, 1988).

When parent companies contract into a joint venture, the resultant structure can be classified as either horizontal or vertical. If both the parents and the joint venture are in the same industry, then the resulting entity is an example of a horizontal joint venture. This horizontal joint venture will then operate in the same product or service market as the parent companies, although management may be located elsewhere. Vertical strategic alliances (also referred to as diversifying or cross-product strategies) arise when the parent firms and the joint venture are not in the same industry. The motivation for vertical joint ventures is usually the search for new skills, technology and resources (Gleason et al., 2003). Some evidence shows that horizontal strategic alliances generate higher abnormal returns than vertical strategic alliances¹ (Chan et al., 1997). Previous studies on joint ventures have focused either upon the wealth or output effects of joint ventures in single industries such as steel (Scheuerman, 1990), chemicals (Backman, 1965; Berg and Friedman, 1977), real estate (He et al., 1997), and financial services industries (Waheed and Mathur, 1995; Gleason et al., 2003) or upon antitrust treatments of joint ventures (Brodley, 1982; Grossman and Shapiro, 1986; Shapiro and Willig, 1990).

Although motivations for joint ventures are strong, it is questionable whether in fact they have positive effects on shareholders' wealth. Past studies have found mixed results. Gleason et al. (2003) study the effects of joint venture and strategic alliances announcements in a sample of companies in the banking, investment services, and

¹ While joint ventures and strategic alliances are both forms of cooperative strategies, strategic alliances are less formal and represent less structured contractual agreements.

insurance industries. They find that these companies earn significant abnormal returns of 0.66 percent on average. They also find significantly positive abnormal returns across the four different modes of expansion: domestic, international, horizontal and diversifying. Johnson and Houston (2000) find that horizontal domestic joint ventures create synergistic gains that are shared by the partners, whereas vertical ones generate gains only for suppliers. McConnell and Nantell (1985) investigate the common stock returns of U.S. companies that announce joint ventures with other U.S. companies and find that there are significant excess returns around the announcement date. They also find that smaller partners earn larger excess rate of return. Kwoka (1992) finds support for wealth creation effects of joint ventures when there is no alteration in the competitive behavior of parent firms after the joint venture. He et al (1997) study the wealth effects of domestic versus international joint ventures in the real estate industry. Their results suggest that domestic real estate joint ventures lead to an increase in firms' value while international joint ventures have non-significant or less significant value creation effects.

While there are studies that have shown positive wealth effects on the announcement date, the literature has also indicated that joint ventures can have negative effects on stock returns on the announcement date. Waheed and Mathur (1995) study announcement effects of foreign expansions through formations of different expansion modes, such as joint ventures, subsidiaries, acquisitions, representative offices or branches, on the market value of U.S. banks. For the overall sample, they find that shareholders of banks earn significant abnormal returns of negative 0.17 percent on the announcement day. They also find that the two-day (-1,0) cumulative average abnormal returns for U.S. banks is negative 0.11. Mohanram and Nanda (1996) find that the US

stock market reacts negatively to domestic joint ventures that are motivated by value reducing managerial concerns. Another study by Chang and Chen (2002) finds similar results. They study joint ventures by Taiwanese firms and find that domestic joint venture announcements are associated with negative abnormal returns. They also find that announcement effects are positively related to investment opportunities, the size of the investment and debt ratio, and are negatively related to the business-relatedness variable².

Previous studies on joint ventures have not focused adequately on the risk-sharing and risk-reducing motivations for creating joint ventures. Contrary to usual expectations in business, it might be the case that companies do not reduce their financial risks when they get involved in establishing joint ventures. Kogut (1989) has attempted to analyze the stability of joint ventures. Factors that improve stability include, but are not limited to, other forms of binding agreements between the parent firms (Kogut refers to this factor as ties), and R&D intensity. Factors that negatively impact stability include, but are not limited to, changes in concentration, and industry growth that leads to competitive rivalry. Competitive factors that motivate the creation of a joint venture have support in the expectation that rivalry between the partner firms would be lessened. However, these factors can also be the source of future instability. As indicated by Berg and Friedman (1981), larger firms seek joint ventures as a medium of technology transfer. Instability can then be triggered by technology imitation, price distortion and competition among the partners (Kogut, 1989).

Several gaps exist in the literature on joint ventures. Most importantly, risk associated with contracting into joint venture agreements has not been adequately

²The business-related variable refers to parent firms announcing the joint venture that have the same two-digit SIC code.

examined. This paper aims at testing the risk-reducing or risk-sharing motive for establishing joint ventures. In addition, this study also finds empirical evidence for the welfare effects of joint venturing on shareholders' wealth in a larger sample. This paper aims at finding empirical evidence for the two most important motives for establishing joint ventures: i) synergy gains resulting from sharing complementary skills and resources and ii) risk-sharing through diversifying joint venture as a corporate strategy. Previous studies have not studied these two motives together. Therefore, it is expected that this study will shed some light on the return, risk and diversification aspects of joint ventures that have previously been inadequately studied. The rest of this paper is organized as follows: section two presents the data and methodology; section three discusses empirical results and test statistics; section four concludes the paper.

2. Data and Methodology

The sample for this study is composed of companies engaged in only two-parent joint ventures over the period of 1981 - 2002³. The sample of joint venture announcing companies was taken from the Securities Corporation Platinum Database. Both parents are included in the joint venture analysis. The final sample is limited to those companies whose stock returns are available on the Center for Research in Security Prices (CRSP). For the purpose of extracting stock returns from CRSP, CUSIP numbers in the data set are merged with PERMNOs (permanent numbers identifying the companies) that are available in CRSP. In order to test whether risk-sharing through diversification is a valid

³ The very large data set and the availability of the data posed certain difficulties in determining whether the joint ventures were domestic or international. The scope of this study does not allow for the classification of joint ventures into domestic and international forms, but this issue will be addressed in a future study.

motive for creating a joint venture, five different sub-samples are constructed. The first sub-sample consists of those firms with different SIC codes that engage in a joint venture also with a different SIC code. The second sub-sample is composed of those firms that have the same SIC codes and engage in a joint venture with the same SIC code as each firm. The third sub-sample consists of those firms with the same SIC codes that engage in a joint venture with a different SIC code. The fourth sample is that where one parent is a diversifying parent, that is, only one firm has a different SIC code from the joint venture. The fifth sub-sample is then one where the other parent has the same SIC code as the joint venture, that is, one parent is non-diversifying parent. In this study, the last three sub-samples are referred to as partial-diversification strategies.

To satisfy the requirement of cross-sectional independence, which is a common requirement in event studies to conduct test statistics, multiple announcements, except for the very first announcement in the overall sample, by the same companies are removed from the other five sub-samples. This process also eliminates the apparent “over-representation problem”, which occurs when joint ventures are announced more than once by the same companies. Finally, only companies with 501 days non-missing returns data around the announcement days (+250, 0, -250) are included in the study. After satisfying all the requirements, 2,188 companies are left for the overall sample analysis. This sample size is very large compared to previous studies conducted on the wealth effects of joint ventures.

2.1. Market Model

The "standard event study" technique based upon the market model is used to test the effect of announcements on stock returns (see Brown and Warner, 1985). The event

study has many applications in the areas of economics, finance and accounting. Some examples of the economy wide events include mergers and acquisitions, earnings announcements, new issues of securities, and announcements related to macroeconomic variables such as trade deficits (MacKinlay, 1997). Economists frequently study the effects of such an economic event on the value of firms. They use financial data to measure the impact of a specific event on the value of a firm. The rationality behind the event study is that the effects of the event will be reflected immediately in security returns. Therefore, measuring the impacts of a specific event on security prices can be constructed in a relatively short time. In contrast, productivity related measures might take many periods of observation.

The market model relates the return of any individual security to the return of market portfolio. The advantage of using the market model is that it allows the researcher to control for the effects of market-wide fluctuations to measure daily abnormal returns (the market model residuals). Commonly used market portfolios are the S&P 500 index, the CRSP Value Weighted Index, and the CSRP Equal Weighted Index. In this study CRSP Equal Weighted Index returns is used as market returns.

For any security j the market model is:

$$R_{jt} = \hat{\alpha}_j + \hat{\beta}_j R_{mt} + \varepsilon_{jt} \quad (1)$$

R_{jt} = the return on security j for period t .

α_j = the intercept term assumed to be constant over the entire time period.

β_j = the systematic risk for security j .

R_{mt} = the market return on the CRSP equal-weighted index in time period t .

ε_{jt} = the error term on security j for period t .

The date of the joint venture announcement is taken as the event date and defined as day $t = 0$. Additionally, the behavior of average abnormal returns is reported over the event window of days $(-5, +5)$. Pre-event parameters are estimated from the market model over the period $t = -250$ to $t = -30$ days relative to the announcement date. Post-event parameters are estimated over the period $t = +30$ to $t = +250$ days relative to the announcement day⁴.

This study tests to see whether synergy gains and risk-sharing through diversification are valid motivations for the creation of joint ventures. For the purpose of risk analysis, total risk (variance of daily stock returns for security j) is partitioned into two components: systematic risk (security j 's beta) and unsystematic risk (variance of the error term ϵ_j in the market model). The systematic risk is a measure of how an individual asset co-varies with the economy, and the unsystematic risk is a firm specific risk and independent of the economy. To test if there is any significant change in all three risk measures after the announcement, changes in the systematic (ΔSYS), unsystematic risk (ΔUNSYS) and total risk (ΔTOTAL) are computed as:

$$\Delta\text{SYS} = (\beta_j, \text{post}) - (\beta_j, \text{pre})$$

$$\Delta\text{UNSYS} = \text{Var}(\epsilon_j, \text{post}) - \text{Var}(\epsilon_j, \text{pre})$$

$$\Delta\text{TOTAL} = \text{Var}(R_j, \text{post}) - \text{Var}(R_j, \text{pre})$$

⁴ Waheed and Mathur (1995) use $(-170$ to $-21)$ and $(+21$ to $+170)$ as the “pre-event” and “post-event” periods respectively. However, in this study, the market model is run for different time periods, but changing the time periods did not affect the direction of the results derived from the market model. To check for robustness, daily average excess returns based upon equal-weighted market index and associated test statistics for the event window of days $[-1, +1]$ are presented in the Appendix section.

2.2. Standardized Abnormal Return

By using the "standard event study" technique and following Waheed and Mathur (1995), the average standardized abnormal return (AAR) for security j for day t is estimated as:

$$AAR_{jt} = \frac{1}{N} \sum_{j=1}^N \frac{R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt}}{S_{jt}} \quad (2)$$

The Ordinary Least Squares (OLS) method is used to estimate the market model parameters α and β over the estimation period $t = -250$ days to $t = -30$ days relative to the announcement day, and the maximum likelihood estimate of standard deviation (S_{jt}) is computed as:

$$S_{jt} = \left[V_j^2 \left[1 + \frac{1}{D} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{k=1}^D (R_{mk} - \bar{R}_m)^2} \right] \right]^{1/2} \quad (3)$$

where,

R_{mt} = market return on the CRSP equal-weighted index in time period t .

$\bar{R}_m$ = mean market return in the estimation period.

V_j^2 = residual variance of security j .

D = number of days in the estimation period.

N = number of announcements in the sample.

R_{jt} = return on security j for period t .

The standardized t statistic is applied to test the hypothesis that standardized average abnormal returns equal zero. In order to make sure that there is no outlier effect, the binomial sign test (B-value) is also employed to test that the proportion of positive

(negative) abnormal returns expected under the null hypothesis is 0.50. The B-values are estimated as $(S-PN)/\sqrt{P(1-P)N} \sim N(0,1)$ where N is number of announcements in the sample, P is the proportion of positive average abnormal returns under the null hypothesis (0.50) and S is the number of positive average residuals (Waheed and Mathur, 1995).

3. Empirical Results

Panel A in Tables 1 to 6 shows daily standardized average abnormal returns (AAR), the Z-values, number of companies with positive daily average abnormal returns (POSAVG), the proportion of daily average positive abnormal returns (%), sample size (N) and the binomial sign test statistic (B-value) for two-party joint ventures. The Z-value is the standardized t statistic to test the hypothesis that the daily average abnormal returns equal zero. The binomial sign test (B-value) is used to test if the proportion of positive abnormal returns in the test period is significantly different from the proportion of positive abnormal returns expected under the null hypothesis (0.50). The binomial sign test is employed to check if a few outliers affect the abnormal returns.

In panel B of Tables 1 to 6, Δ SYS refers to change in systematic risk, Δ UNSYS refers change in unsystematic risk, Δ TOTAL refers to change in total risk, N+ refers to the number of companies for which there is an increase in the risk level after the joint venture announcement, N- refers the number of companies for which there is a decrease in the risk level after the joint venture announcement. Associated test statistics - the ranked sign test and paired t-test - for each risk measures are also provided in panel B. The paired t- test (one tail test) statistic tests whether the mean difference for unsystematic risk and systematic risk is different from zero. SIC1, SIC2 and JVSIC refer to SIC codes for the first parent, the second parent and the joint venture respectively. To

check if changes in the levels of the risk measures, Δ SY, Δ UNSY and Δ TOTAL, are due to outliers, the median signed rank (Wilcoxon) test statistics are also presented in panel B (see for example, Siegel & Castellan; Nonparametric Statistics, 2nd ed.; p.90).

Panel A of Table 1 shows the standardized daily average abnormal return (AAR) estimations and the associated test statistics for the overall sample of 2188 firms. The AAR on the day of announcement is 30 percent, which is significant at the one percent level. This indicates that, for the overall sample, there is strong evidence that the shareholders of the companies engaged in joint ventures, on average, experience highly significant positive abnormal returns at the time of such announcements.

Table 1: Daily average abnormal returns and test statistics for the overall sample.						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	0.023	1.089	1007	46.02	2188	-3.720***
-4	0.055***	2.566	1033	47.21	2188	-2.608***
-3	-0.005	-0.240	985	45.01	2188	-4.661***
-2	-0.001	-0.034	1021	46.66	2188	-3.121***
-1	0.038*	1.756	1047	47.85	2188	-2.010**
0	0.300***	14.051	1174	53.65	2188	3.421***
1	0.028	1.315	1026	46.89	2188	-2.907***
2	-0.004	-0.206	1028	46.98	2188	-2.822***
3	-0.044**	-2.059	982	44.88	2188	-4.789***
4	-0.060***	-2.791	964	44.05	2188	-5.558***
5	-0.004	-0.202	995	45.47	2188	-4.233***
Panel B: Testing the hypothesis that joint ventures are risk-reducing strategies. Significance of the change in systematic, unsystematic and total risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N+	N-	Z	p-value	t	p-value
Δ SY	1041	1147	-2.628	0.0086	-2.10	0.0181
Δ UNSY	1179	1009	4.326	0.0000	3.30	0.0005
Δ TOTAL	1183	1005	4.685	0.0001	3.44	0.0003

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Since 1174 (i.e., 54 %) of 2188 announcements have positive abnormal returns, and the binomial sign test shows that it is significant at 1% level, this finding is not due to an

outlier effect. The announcement day $t = 0$ is the only day on which more than 50 percent of the companies significantly observe positive returns. On the day $t = 1$, there is positive 2.8 percent return but it is not significantly different from zero. The proportion of companies that observe positive abnormal returns before and after the announcement day ($t = 0$) is significantly less than 50 percent. The positive and significant announcement effect disappears the day after the announcement ($t = 1, 2, 3, 4$ and 5). Panel B of Table 1 reports the change in the levels of systematic, unsystematic and total risk measures. Both the t-statistics and the Wilcoxon ranked-sign test statistics significantly indicate that systematic risk has decreased and unsystematic and total risks have increased. If number of assets in a well-diversified portfolio is large enough, then the unsystematic risk tends towards zero. Therefore, if a single asset becomes part of well-diversified portfolio, the unsystematic risk can be diversified away and therefore it can be ignored. However all securities will have some level of systematic risk that cannot be eliminated through diversification. Because systematic risk is directly related to movements in overall market conditions such as inflation and interest rates. These movements occur regardless of what an individual investor follows as an investment strategy. The systematic risk is then the most crucial risk for all investors. Since the findings for overall sample in Panel B of Table 1 show that the systematic risk has decreased, it can be concluded that firms share risk through joint ventures and that risk-sharing motive is a valid motive for joint ventures.

Table 2 refers to the sub-sample where both parent firms and the joint venture have different SIC codes. In this study, since each parent company and the resulting joint venture have entirely different SIC codes, it is referred to as full-diversification strategy.

Panel A shows that the AAR at $t = 0$ is 0.36 which is significant at the one percent level and higher compare to AAR of 0.30 for overall sample in Table 1. Again 539 (i.e., 56 %) of 956 announcements have positive returns, this finding cannot be attributed to any outlier effect since the binomial sign test statistic (B-value of 3.95) shows that on the day of announcement ($t = 0$) proportion of announcements with positive abnormal return is significantly greater than 50 percent .

Table 2: Daily average abnormal returns (AAR) where both parent firms and joint venture have different SIC codes ($SIC1 \neq SIC2 \neq JVSIC$).						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	-0.050	-1.539	434	45.39	956	-2.846***
-4	0.051	1.578	453	47.38	956	-1.617
-3	-0.010	-0.310	413	43.20	956	-4.205***
-2	0.044	1.348	456	47.69	956	-1.423
-1	0.020	0.606	460	48.11	956	-1.164
0	0.357***	11.028	539	56.38	956	3.946***
1	0.008	0.232	454	47.48	956	-1.552
2	0.008	0.254	443	46.33	956	-2.264**
3	-0.065**	-2.016	421	44.03	956	-3.687***
4	-0.071**	-2.188	412	43.09	956	-4.269***
5	-0.048	-1.473	430	44.97	956	-3.105***
Panel B: Testing the hypothesis that joint ventures are risk-reducing strategies. Significance of the change in systematic, unsystematic and total risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N+	N-	Z	p-value	t	p-value
ΔSYS	447	509	-2.36	0.0092	-2.34	0.0098
$\Delta UNSYS$	532	424	4.39	0.0000	3.75	0.0001
$\Delta TOTAL$	539	417	4.59	0.0000	3.88	0.0001

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

In Panel B of Table 2, the t-statistic shows that companies have lower level of systematic risk and higher level of unsystematic and total risks after the joint venture announcement when both parents diversify. The Wilcoxon ranked sign test also supports the same result. Increase in total risk, however, is due to an increase in unsystematic risk which in turn can be diversified away. This indicates that parents following a full-diversification

strategy benefit from risk sharing through joint ventures as the stock markets view those joint venture announcements as indicative of diversifying cooperative strategy. Table 3 refers to the sub-sample where the parent firms and the joint venture have the same SIC codes. That is, this sample includes firms that choose not to diversify through joint ventures.

Table 3: Daily average abnormal returns where both parent firms and joint venture have the same SIC codes (SIC1 = SIC2 = JVSIC).						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	0.170***	2.886	150	52.08	288	0.707
-4	0.048	0.813	136	47.22	288	-0.943
-3	0.007	0.117	131	45.49	288	-1.532
-2	0.037	0.633	133	46.18	288	-1.296
-1	0.077	1.299	143	49.65	288	-0.118
0	0.160***	2.721	146	50.69	288	0.236
1	0.049	0.825	136	47.22	288	-0.943
2	-0.007	-0.121	135	46.88	288	-1.061
3	-0.091	-1.546	125	43.40	288	-2.239**
4	-0.089	-1.518	126	43.75	288	-2.121**
5	0.015	0.253	139	48.26	288	-0.589
Panel B: Testing the hypothesis that joint ventures are risk-reducing strategies. Significance of the change in systematic, unsystematic and total risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N+	N-	Z	p-value	t	p-value
Δ SYS	136	152	-0.57	0.2856	0.21	0.4155
Δ UNSYS	145	143	0.73	0.2335	-0.39	0.3487
Δ TOTAL	142	146	0.64	0.2619	-0.34	0.3861

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Panel A of Table 3 shows that the AAR at $t = 0$ is 0.16 which is again significant at the one percent level. However in the case of non-diversifying joint venture announcements (Table 3), the AAR at $t = 0$ is lower (16%) than the AAR of 36% when the joint venture is a diversifying strategy (Table 2). This indicates that shareholders of diversifying firms gain more than the shareholders of non-diversifying firms. In Panel B, the t-test statistic and the nonparametric sign test statistic together show that there is no significant change

in systematic, unsystematic and total risks. These results show that there is no risk sharing benefit associated with joint venture announcements established between parent firms that have the same SIC code as joint venture industry.

Panel A of Table 4 shows the results where both parent companies have the same SIC code but the joint venture has a different SIC code. In this sample parent firms diversify by establishing a joint venture in an entirely different industry even though parent firms are from the same industry.

Table 4: Daily average abnormal returns where parent companies have the same SIC codes but the joint venture has a different SIC code (SIC1 = SIC2 $\neq$ JVSIC). Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	-0.002	-0.044	155	47.26	328	-0.994
-4	-0.079	-1.434	150	45.73	328	-1.546
-3	-0.036	-0.658	140	42.68	328	-2.650***
-2	0.014	0.246	155	47.26	328	-0.994
-1	0.135**	2.439	159	48.48	328	-0.552
0	0.164***	2.964	170	51.83	328	0.663
1	0.094**	1.707	158	48.17	328	-0.663
2	0.008	0.154	156	47.56	328	-0.883
3	-0.078	-1.405	139	42.38	328	-2.761***
4	0.013	0.243	159	48.48	328	-0.552
5	-0.096*	-1.745	140	42.68	328	-2.650***
Panel B: Testing the hypothesis that joint ventures are risk-reducing strategies. Significance of the change in systematic, unsystematic and total risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N+	N-	Z	p-value	t	p-value
Δ SYs	144	184	-1.55	0.0602	-0.54	0.2947
Δ UNSYs	174	154	0.62	0.2676	-0.18	0.4300
Δ TOTAL	174	154	0.73	0.2341	-0.12	0.4523

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

The AARs at days $t = -1, 0$ and 1 are $0.14, 0.16$ and 0.09 respectively and they are all significant. In panel B of Table 4, the t-test statistic shows that there is no change in both systematic and unsystematic risks after the joint venture announcement. However, the Wilcoxon ranked sign test statistic shows that at the 6 percent significance level

systematic risk decreases after the announcement. This finding suggests that the evidence for fall in systematic risk is more apparent when both parents from different industries establish joint venture in entirely different industry (full-diversification strategy) as shown in Table 2. The number of companies with a decrease in systematic risk (184) is greater than that of companies with an increase in systematic risk (144). This shows that parent firms within the same industry become less risky after establishing joint venture in a different industry.

Another sub-sample is created where one parent is in the same industry as the joint venture industry. In this sample one of the parents that has different SIC code from joint venture is classified as diversifying parent and the other parent is classified as non-diversifying parent. Table 5 shows results for the non-diversifying parents and Table 6 shows results for the diversifying parents.

Table 5: Daily average abnormal returns for non-diversifying parents (parent 2) that have same SIC code as the joint venture (SIC1 $\neq$ SIC2 = JVSIC).						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	0.031	0.491	117	45.70	256	-1.375
-4	0.048	0.771	118	46.09	256	-1.250
-3	-0.004	-0.071	117	45.70	256	-1.375
-2	0.051	0.810	122	47.66	256	-0.750
-1	0.112*	1.795	130	50.78	256	0.250
0	0.388***	6.213	128	50.00	256	0.000
1	0.031	0.502	128	50.00	256	0.000
2	-0.082	-1.317	127	49.61	256	-0.125
3	0.025	0.395	126	49.22	256	-0.250
4	0.009	0.139	125	48.83	256	-0.375
5	0.014	0.231	118	46.09	256	-1.250
Panel B: Testing the hypothesis that joint ventures are risk-reducing strategies. Significance of the change in systematic, unsystematic and total risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N+	N-	Z	p-value	t	p-value
Δ SYS	107	149	-2.24	0.0126	-0.92	0.1788
Δ UNSYS	119	137	-0.51	0.3061	-0.38	0.3515
Δ TOTAL	118	138	-0.51	0.3061	-0.37	0.3559

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Panel A of Table 5 shows that the AAR at $t = 0$ is 0.39 which is significant at the one percent level. The AAR on day $t = -1$ is 11.2 percent and it is significant at ten percent level. However, the AARs after the announcement day are not significantly different from zero. On day $t = 0$, the number of companies with a positive abnormal return (128) is the same as the number of companies with a negative abnormal return (128). Additionally, the binomial sign test shows that proportion of total announcements with positive abnormal returns is not significantly different from 50 percent for each day in the event window of $[-5,5]$. In panel B of Table 5, both the binomial sign test and the t-test statistics show that systematic and unsystematic risk for non-diversifying parents remain the same after joint venture announcement. However the sign test shows that the systematic risk has decreased after the announcement.

Table 6: Daily average abnormal returns for diversifying parents (parent 1) that have different SIC code from the joint venture ($SIC1 \neq SIC2 = JVSIC$).						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	0.050	0.995	198	50.38	393	0.151
-4	0.167***	3.305	187	47.58	393	-0.958
-3	0.029	0.574	189	48.09	393	-0.757
-2	-0.046	-0.915	184	46.82	393	-1.261
-1	0.079	1.575	184	46.82	393	-1.261
0	0.435***	8.626	197	50.13	393	0.050
1	0.104**	2.057	182	46.31	393	-1.463
2	0.070	1.382	192	48.86	393	-0.454
3	0.005	0.099	188	47.84	393	-0.858
4	-0.042	-0.839	180	45.80	393	-1.665*
5	-0.076	-1.502	175	44.53	393	-2.169**
Panel B: Testing the hypothesis that joint ventures are risk-reducing strategies. Significance of the change in systematic, unsystematic and total risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N+	N-	Z	p-value	t	p-value
ΔSYS	181	212	-1.17 [†]	0.1210	0.02	0.4916
$\Delta UNSYS$	224	169	3.18	0.0007	2.89	0.0020
$\Delta TOTAL$	221	172	3.43	0.0003	3.05	0.0012

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

[†] significant with p-value of 12.10 percent.

Panel A of Table 6 shows that the AAR on the day of announcement is 43.5 percent and significant at one percent level. Additionally, the AAR on day $t = 1$ is 10.4 percent for diversifying parent and it is also significant at five percent level. The binomial sign test statistics in panel B of Table 6 indicate that the proportion of total announcements with positive abnormal returns is not significantly different from 50 percent for each day in the event window except for days $t = 4$ and 5. In Panel B, the nonparametric sign test statistics show that systematic risk has decreased at 12 percent significance level. The number of companies with decrease in systematic risk (212) is greater than the number of companies with an increase in systematic risk (181). This provides some evidence that diversifying parent becomes less risky after announcing joint venture in different industry. On the other hand, the t test statistics show there is no significant change in systematic risk but there is a significant increase in unsystematic and total risks.

In general the findings in Tables 5 and 6 together suggest that when only one parent diversifies through joint venture, shareholders of diversifying parents, on average, earn higher abnormal return on the announcement day. In addition, the findings also suggest that when only one parent diversifies, the binomial sign test shows that the systematic risk for diversifying parent decreases with twelve percent significance level. This finding is not supported by the t -test. However, both the sign test and t -test statistics show that the unsystematic and total risks for diversifying parent increase at one percent significance level. Similarly, the sign test also shows that the systematic risk for the non-diversifying parent decreases whereas the t -test shows that there is no significant change

in the systematic risk. On the other hand, both the sign test and t-test statistics indicate that there is no significant change in unsystematic and total risk measures.

4. Conclusion

This study tests to see whether diversification and risk-sharing are valid motivations for the creation of joint ventures. The "standard event study" technique based upon the market model is used to examine the risk and return effects of two-parent joint venture announcements.

To investigate if synergy gains and risk-sharing through diversification are valid motives for joint ventures, five different sub-samples are constructed. The overall sample includes firms announcing joint venture for the very first time. Similarly, the five sub-samples also include first joint venture announcements except when an announcement made by a firm exists in a sub-sample more than once, then that firm is excluded from the sub-sample. The test statistics for the overall sample evidence that the systematic risk decreases while unsystematic and total risk increase. The same results apply to the sub-sample where two firms from different industries announce a joint venture in an entirely different industry (full-diversification strategy). When a security is held in isolation, increase in total risk might indicate that the risk due to uncertainty in the new product market outweighs the diversification benefits gained from joint ventures. However, the firm-specific unsystematic risk should not be important for an individual investor holding a well-diversified portfolio of assets. Conversely, the analysis for the sample where both parent companies are in the same industry as the joint venture, non-diversifying strategy, shows that there is no change in all three risk measures after the joint venture is

announced. Thus, these findings show that a full-diversification strategy reduces systematic risk and validates the risk-sharing motive for a joint venture.

The same analysis is applied to the remaining sub-samples in which either one parent firm is from the same industry as the joint venture or both parents are within the same industry but establish a joint venture in a different industry. These sub-samples could be referred to as partial-diversification strategies.

The binomial sign test statistics for the parents where both are in the same industry but engage in a joint venture in a different industry evidence that the systematic risk decreases while unsystematic risk and total risk remain the same. However, the reduction in the systematic risk is not supported by the t-test. Finally, when a sub-sample is created where only one parent is in the same industry as the joint venture, the findings for non-diversifying parents show a reduction in systematic risk while unsystematic risk and total risk remain the same. However, in the case of diversifying parents, the binomial sign test shows that unsystematic risk and total risk increase while the systematic risk decreases. However, the reduction in systematic risk for diversifying parent is not supported by the t-test. In general, the findings for the last three sub-samples (partial-diversification strategies) somewhat show weak evidence for reduction in systematic risk. On the other hand, the full-diversification strategies through joint ventures exhibit strong evidence that the systematic risk falls. And finally non-diversification strategies present no change in all three risk levels.

For all the samples, the shareholders of the companies engaged in joint ventures, on average, experience highly significant positive abnormal returns based upon the market model— between approximately 16 percent and 44 percent - at the time of such

announcements. Average abnormal returns after the day of announcement are mostly negative or not significantly different from zero. Another important finding of this paper is that the full-diversification strategies yield higher abnormal returns on the announcement day than those of non-diversifying strategies (36% as opposed to 16% abnormal returns). This also true when only one parent diversifies and the second parent doesn't, diversifying parent earns higher abnormal return on the announcement day (44 percent as opposed to 39 percent). These results contradict the findings of Gleason et al (2003), Weston and Copeland, 1988, Sicherman and Pettway, 1987, and Scanlon, Trifts, and Pettway, 1989 that suggest that corporate mergers/joint ventures in a related business line (horizontal or non-diversifying strategies) dominate mergers in different industries (diversifying strategies).

Appendix 1

A1. Daily Average Excess Returns for Three-day Event Window

Table A1: Daily average excess returns based on equal-weighted market index for three-day event window and associated t-test statistics.						
Type of joint venture	N	Day (t)	AER	σ	t-value	p-value
Full-diversification strategy SIC1 $\neq$ SIC2 $\neq$ JVSIC	956	-1	0.0010	0.052	0.58	0.5605
Non-diversifying SIC1 = SIC2 = JVSIC	288	-1	0.0047	0.054	1.47	0.1426
Partial diversification SIC1 = SIC2 $\neq$ JVSIC	328	-1	0.0069***	0.045	2.75	0.0063
Diversifying parent (parent 1) SIC1 $\neq$ SIC2 = JVSIC	393	-1	0.0026	0.048	1.08	0.2800
Non-diversifying parent (parent 2) SIC1 $\neq$ SIC2 = JVSIC	256	-1	0.0072***	0.043	2.72	0.0069
Full-diversification strategy SIC1 $\neq$ SIC2 $\neq$ JVSIC	956	0	0.0156***	0.065	7.44	<.0001
Non-diversifying SIC1 = SIC2 = JVSIC	288	0	0.0129***	0.072	3.04	0.0026
Partial diversification SIC1 = SIC2 $\neq$ JVSIC	328	0	0.0074***	0.050	2.68	0.0076
Diversifying parent (parent 1) SIC1 $\neq$ SIC2 = JVSIC	393	0	0.0163**	0.144	2.25	0.0247
Non-diversifying parent (parent 2) SIC1 $\neq$ SIC2 = JVSIC	256	0	0.0161***	0.088	2.91	0.0039
Full-diversification strategy SIC1 $\neq$ SIC2 $\neq$ JVSIC	956	+1	0.0009	0.057	0.47	0.6397
Non-diversifying SIC1 = SIC2 = JVSIC	288	+1	0.0066	0.076	1.48	0.1398
Partial diversification SIC1 = SIC2 $\neq$ JVSIC	328	+1	0.0048	0.055	1.57	0.1164
Diversifying parent (parent 1) SIC1 $\neq$ SIC2 = JVSIC	393	+1	0.0035	0.047	1.48	0.1401
Non-diversifying parent (parent 2) SIC1 $\neq$ SIC2 = JVSIC	256	+1	0.0001	0.040	0.04	0.9654

Table A1 in the Appendix 1 presents daily average excess returns based upon equal-weighted marked index are obtained from CRSP. For all five sub-samples, the findings suggest that there is strong evidence that the shareholders of the companies engaged in

joint ventures, on average, experience positive and significant excess returns – approximately between 1.29 to 1.63 percent - at the time of such announcements. However, daily average excess returns one day before and one day after the day of announcement (days $t = -1$ and $t = +1$) are not significantly different from zero except for day $t = -1$. On this day, the non-diversifying parent in the sub-sample where $SIC1 \neq SIC2 = JVSIC$ earns positive and significant excess return of 0.72 percent. On the same day, the diversifying parents in the partial diversification sample where $SIC1 = SIC2 \neq JVSIC$ earn positive and significant excess return of 0.69 percent.

A2. Summary of Tables 1 to 6 Presented in Section 3 of Chapter 1

Table A2: Summary of the Tables 1 through 6 presented in section 3 of Chapter 1.					
Samples	AAR ($t = 0$)	Type of Joint Venture	Systematic Risk	Unsystematic risk	Total Risk
Overall Sample ($n=2188$)	30 %	NA	Decrease	Increase	Increase
$SIC1 \neq SIC2 \neq JVSIC$ ($n=956$)	36 %	Full-diversification	Decrease	Increase	increase
$SIC1 = SIC2 =$ $JVSIC$ ($n=288$)	16 %	Non-diversifying	No change	No change	No change
$SIC1 = SIC2 \neq JVSIC$ ($n=328$)	16 %	Partial diversification	Decrease (weak evidence)	No change	No change
$SIC1 \neq SIC2 = JVSIC$ ($n=256$)	39 %	Non-diversifying parent	Decrease (weak evidence)	No change	No change
$SIC1 \neq SIC2 = JVSIC$ ($n=393$)	44 %	Diversifying parent	Decrease (weak evidence)	Increase	Increase

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Chapter 2. Second Essay:

Risk and Return Effects of Joint Ventures:

An Empirical Analysis of the Relative Size Hypothesis

Abstract

The second essay aims at finding empirical evidence for the relative size hypothesis in two-parent joint venture analysis over the period of 1981 – 2002. To test for the validity of the relative size hypothesis, two methodologies are utilized: i) market capitalization ii) abnormal returns based upon the market model. Each firm in the sample is categorized as “small”, “medium” or “large” firm in the joint venture according to its market value of common equity. Then, three sub-samples are formed in such a way that relatively different size parents announce joint venture: i) small vs. large ii) small vs. medium and iii) medium vs. large. Empirical findings based on these two methodologies support the relative size hypothesis predicts that market reaction to a joint venture announcement is inversely related to firm’s size relative to its partner. The risk analysis of joint ventures between small and large size partners shows that systematic risk for both parents, regardless of their relative size, decreases while unsystematic and total risk levels do not change. Secondly, when the joint venture is between small and medium size parents, the medium size parents benefit from lower level of systematic risk through joint ventures whereas small parents experience no change in systematic risk. Both small and medium size parents do not observe any change in both total and unsystematic risks. Finally, when a sub-sample is formed where medium size firms partner with large firms, medium size firms do not experience any change in all three risk measures while large size firms experience increase in all three measures of the risk.

Chapter 2: Risk and Return Effects of Joint Ventures:

An Empirical Analysis of the Relative Size Hypothesis

1. Introduction

A joint venture is established when two or more firms pool their tangible and intangible assets to achieve some objective under the combined management of the parent companies. It is a new legal entity owned by two or more parent firms. One of the most important characteristics of joint ventures is that they are formed temporarily and that providers of intermediate goods claim on the residual resulting from the operations of the joint venture. In this regard, joint ventures are different from corporate mergers. Management under the joint venture differs from that of the parent firms - the original management of the parent firms remains intact under the joint venture. While mergers join two firms together, joint ventures create entirely new entities (McConnell and Nantell, 1985).

McConnell and Nantell (1985) emphasize several motives for establishing joint ventures and group them under “synergistic” gains resulting from sharing complementary skills and resources. They are as following: 1) Risk sharing to overcome uncertainty in demand and technology 2) Achieve economies of scale in production 3) augmented market power 4) enhanced marketing and product distribution techniques 5) Reallocation of assets to more profitable uses.

Hennart (1991) mentions further instances where joint ventures can be advantageous; the first is when a joint venture operates in a different market from that of the parent firm. In this case, the parent may find that intermediate inputs needed to venture into a new industry are held by another parent, are difficult to acquire by

contract, are costly to replicate, and are therefore most efficiently obtained through a joint venture. Secondly, for the case of international joint ventures, a firm that enters a foreign market for the first time is also likely to opt for a joint venture. This is because such a firm will lack the knowledge of local conditions. Thirdly, firms may also engage in joint ventures to obtain access to resources that are controlled by other firms. This is likely to be the case in natural resource industries where government policies discourage or forbid full ownership by international companies. Finally, joint ventures are used to combine complementary inputs held by two separate firms, when the market for both of these inputs has high transaction costs.

In another study, Hennart (1988) adopts the transaction cost theory of joint ventures and argues that joint ventures are efficient and should be the preferred mode of cooperative strategy when two conditions are met at the same time: i) imperfect intermediate goods market where parent firms operate (know-how, raw materials, parts and machinery etc.); ii) purchase or reproduction of the resources that used in the production of those goods is more costly than procurement of the right to use the same under the joint venture agreement. In case of market failure for intermediate goods, being co-owner in the new entity will help reduce or eliminate parent firms' incentive to deviate from their objective set by joint venture agreement. The seller of the intermediate goods will have less incentive to take advantage of the buyer by increasing prices or lowering the quality of the goods. Therefore, joint venturing can lower the transaction cost of pooling intermediate inputs into the production process. Also, acquiring the resources is less efficient than having the right to use them through joint ventures when the required assets for use in the production process cannot be separated from non-required ones.

Previous studies on joint ventures that are closely related to the objective of this paper can be categorized as: the “wealth effect” and the “size effect” studies. The size effect refers to the anomaly that small firms, on average, earn higher returns than large firms. The joint venture literature under these two categories provides mixed results.

Some studies on the wealth effects of joint ventures show that shareholders experience significantly positive abnormal returns at the announcements of joint ventures (Gleason et al., 2003; Johnson and Houston, 2000; Mohanram and Nanda, 1996; Kwoka, 1992; He et al., 1997; McConnell and Nantell, 1985). Gleason et al. (2003) study the effects of joint venture and strategic alliances announcements in a sample of companies in the banking, investment services, and insurance industries. They find that these companies earn significant abnormal returns of 0.66 percent on average. They also find significantly positive abnormal returns across the four different modes of expansion: domestic, international, horizontal and diversifying. Johnson and Houston (2000) find that horizontal domestic joint ventures create synergistic gains that are shared by the partners, whereas vertical ones generate gains only for suppliers. McConnell and Nantell (1985) investigate the common stock returns of U.S. companies that announce joint ventures with other U.S. companies and find that there are significant excess returns around the announcement date. They also find that smaller partners earn larger excess rate of return. Kwoka (1992) finds support for wealth creation effects of joint ventures when there is no alteration in the competitive behavior of parent firms after the joint venture. He et al (1997) study the wealth effects of domestic versus international joint ventures in the real estate industry. Their results suggest that domestic real estate joint ventures lead to an increase in firms’ value while international joint ventures have non-

significant or less significant value creation effects.

However, some other studies show that market reaction to the announcements of joint ventures could be negative as shown by Waheed and Mathur,1995; Mohanram and Nanda,1996; Chang and Chen,2002. Waheed and Mathur (1995) study the effects of foreign expansion on the market value of U.S. banks. They find that shareholders of banks earn significant abnormal returns of negative 0.17 percent on the announcement day. Mohanram and Nanda (1996) find that the US stock market reacts negatively to domestic joint ventures that are motivated by value reducing managerial concerns. Another study by Chang and Chen (2002) finds similar results. They study wealth effects of domestic joint ventures by Taiwanese firms and find that domestic joint venture announcements are associated with negative abnormal returns.

However, there has been little amount of research on firm size and joint ventures. Previous studies that address the size effect of joint ventures are by Chang and Chen (2002), Chen, Hu and Shieh (1991), Crutchley, Guo and Hansen (1991), Mohanram and Nanda (1996), McConnell and Nantell (1985). However, the empirical results on the size effect of joint ventures are also mixed. Joint ventures offer small firms access to resources from which they may otherwise be foreclosed. Hence, the strategic benefits associated with domestic joint ventures are likely to be higher for smaller firms. Furthermore, joint venture announcements by large firms may convey less unexpected information than those by small firms, as information production and spreading is related to firm size. Therefore, the stock market's response to a joint venture announcement should be inversely related to firm size relative to its partner. Also, when a small firm is able to attract the attention of a much larger firm into a joint venture, this could lead to

positive adjustment in the small firm's valuation (Mohanram and Nanda, 1996). Further, Dollinger (1990) and Dollinger and Golden (1992) show that cooperative strategies reduce uncertainties exist in market conditions for small firms and improve their sales performance.

Chang and Chen (2002) find that announcement effects are positively related to investment opportunities, the size of the investment and debt ratio, and are negatively related to the business-relatedness variable⁵. Finally they find that firm size has no explanatory power in explaining the wealth effect of domestic joint ventures by Taiwanese firms. Therefore, their results do not support the relative size hypothesis. Mohanram and Nanda (1996) study US domestic joint ventures and find evidence for the absolute size hypothesis. They document that the smaller firms gain benefit when strategic motivation is the main driving source for the domestic joint venture. Chen, Hu and Shieh (1991) examine joint ventures in China announced by 73 US-based firms during the period of 1979-90 and find that the US partners earn significantly positive abnormal return. However, they find that abnormal returns are not related to firm size, or to the US partners' prior presence in China. Crutchley, Guo and Hansen (1991) look at joint venture announcements between the US and Japanese firms and find that the market reacts positively to the US partners over the announcement period. They also find evidence for the size effect that smaller US partners experience higher abnormal returns relative to larger Japanese partners. Moreover, they show that the US partner's percentage gain from the joint venture is inversely related to that partner's size. In particular they report that relatively larger Japanese partners experience larger percentage

⁵The business-related variable refers to parent firms announcing the joint venture that have the same two-digit SIC code.

gains than do relatively smaller Japanese partners. McConnell and Nantell (1985) find that the smaller partner in a domestic joint venture earns a larger abnormal return, but the smaller dollar value, than the larger partner.

These mixed findings suggest that further evidence on the size effect of joint ventures is definitely needed. Furthermore, while previous studies on the wealth and size effects of joint ventures provide insightful information, they have not investigated these issues together with risk effects associated with joint venture announcements, which is central to this study. Thus, the previous findings reflect only one side of the story without analyzing the risk associated with joint venture announcements. Contrary to common expectations, it might be the case that companies do not reduce their financial risks when they get involved in establishing joint ventures. Kogut (1989) has attempted to analyze the stability of joint ventures. Factors that improve stability include, but are not limited to, other forms of binding agreements between the parent firms (Kogut refers to this factor as ties), and R&D intensity. Factors that negatively impact stability include, but are not limited to, changes in concentration, and industry growth that leads to competitive rivalry. Competitive factors that motivate the creation of a joint venture have support in the expectation that rivalry between the partner firms would be lessened. However, these factors can also be the source of future instability. As indicated by Berg and Friedman (1981), larger firms seek joint ventures as a medium of technology transfer. Instability can then be triggered by technology imitation, price distortion and competition among the partners (Kogut, 1989).

Therefore, the direction of change in risk after the joint venture announcement remains to be an empirical question that has not been studied. Moreover, the previous

studies on joint ventures used smaller sample size relative to the sample size used in this study. Hence, this study aims at filling the gap in the literature by providing empirical evidence for both wealth and risk effects of joint ventures in the context of the relative size hypothesis. The rest of this paper is organized as follows: section two presents the data and methodology; section three discusses empirical results and test statistics; section four concludes.

2. Data and Methodology

This paper examines stock market reactions to the joint venture announcements involving only two firms that differ in their sizes for the period of 1981 to 2002. The sample of joint venture announcing companies was taken from the Securities Corporation Platinum Database. To test for the validity of relative size hypothesis, two methodologies are utilized: i) market capitalization and ii) abnormal returns. Different criteria for each methodology were applied to get the final sample for the analysis. However, the market value of common stocks (market capitalization) 30 trading days prior to the announcement day ($t=-30$) is used as a measure for firm size for both methodologies. For this reason, firms with missing market capitalization data on that day are excluded from the study. For the market capitalization methodology, change in market value of the common stocks for different intervals around the announcement day ($t=0$) is used to capture market reaction to the joint venture announcements. Therefore, around day $t = 0$, there must be market capitalization data available for the intervals of $[-30,-7]$, $[-30,0]$, $[-7,0]$, $[-2,0]$, $[0,2]$, and $[0,7]$ to analyze market reaction to the joint venture announcements for different sub-samples. Moreover, there must be no contaminating joint venture announcements for each parent firm 30 trading days before and after the day of

announcement [-30,0,30]. For the same reason, such events are also excluded from initial sample, resulting in 1,897 announcements or number of 3,794 firms. Then, these 3,794 firms' market values are ranked from largest to smallest. Market capitalization ranking is ranging from \$222,000 to \$538 billion with mean of \$ 9.8 billion and median of \$681 million.

To study the validity of the relative size hypothesis in joint ventures, different sub-samples of joint ventures were constructed. The firms in this sample were then categorized as “small”, “medium” or “large” parent firms according to the total market value of their common stock 30 trading days before the initial announcement of the joint venture ($t=-30$). Afterward, the upper 1/3 of the market capitalization rankings of the firms announcing joint ventures is categorized as large firms with market value of \$2.7 billion or above, the lower 1/3 of the market capitalization rankings of joint venture partners is categorized as small firms with market capitalization of \$176 million or less, and finally the middle 1/3 is categorized as medium size firms with market capitalization of between \$2.7 billion and \$176 million. Next, by using this information and sample criteria, joint venture partners are matched in a way that small size firms announce joint venture with large size firms, small size firms with medium size firms, and medium size firms with large size firms. In all of these samples, firms with only one joint venture announcement are included.

The second methodology is to estimate abnormal returns around the announcement day. Abnormal returns of joint venturing parents are estimated by using the standard event study methodology that uses the market model. To satisfy the requirement of cross-sectional independence, which is a common requirement in event

studies to conduct test statistics, multiple announcements, except for the very first announcement, by the same companies are removed from the sample. This process also eliminates the “industry bias” due to the “over-representation problem” (McConnell and Nantell, 1985), which occurs when joint ventures are announced more than once by the same companies⁶. Finally, only parents with 501 days non-missing returns data around the announcement days (+250, 0, -250) are included since this study aims at finding empirical evidence for both welfare and risk effects of joint ventures that involve firms relatively differ in size. For both methodologies, the final samples are limited to those companies whose stock returns and market capitalization data are available on the Center for Research in Security Prices (CRSP) database. Satisfying all of these criteria resulted in different sample size for each sub-sample analysis.

The "standard event study" technique is used to test the effect of announcements on stock returns (see Brown and Warner, 1985). The rationality behind the event study is that the effects of the event will be reflected immediately in security returns. Therefore, measuring the impact of a specific event on security prices can be constructed in a relatively short time. In contrast, productivity related measures might take many periods of observation. The market model relates the return of any individual security to the return of the market portfolio. The advantage of using the market model is that it allows the researcher to control for the effects of market-wide fluctuations to measure daily abnormal returns (the market model residuals). Commonly used market portfolios are the S&P 500 index, the CRSP Value Weighted Index, and the CSRP Equal Weighted Index.

⁶To test for the industry bias due to over-representation, McConnell and Nantel (1985), however, construct a non-contaminated sample by excluding joint ventures categorized as real estate development and television programming, motion pictures, video games, etc. They find that the empirical results for non-contaminated sample are very similar to those for the full sample.

In this study CRSP Equal Weighted Index returns is used as market returns. For any security j the market model is:

$$R_{jt} = \hat{\alpha}_j + \hat{\beta}_j R_{mt} + \varepsilon_{jt} \quad (1)$$

where, R_{jt} is the return on the j th security in time period t , R_{mt} is the market return on the CRSP equal weighted index, α_j is an intercept assumed to be constant over the entire time period, β_j is the systematic risk for security j , and ε_{jt} is the error term for j th security in period t .

The date of the joint venture announcement is taken as the event date and defined as day $t = 0$. Additionally, the behavior of average abnormal returns is reported over the event window of days $(-5, +5)$. Pre-event parameters are estimated from the market model over the period $t = -250$ to $t = -30$ days relative to the announcement date. Post-event parameters are estimated over the period $t = +30$ to $t = +250$ days relative to the announcement day.

This study tests to see if the “relative size hypothesis” holds and if risk measures associated with each sub-sample show any significant change after the joint venture announcement. For that reason, total risk is partitioned into systematic risk (β_j) and unsystematic risk, variance of ε_j , $\text{Var}(\varepsilon_j)$. The systematic risk is a measure of how an individual asset co-varies with the economy, and the unsystematic risk is a company specific risk and independent of the economy. Variance of daily common stock returns for any security j , $\text{Var}(R_j)$, is used for total risk. To test if there is any significant change in all three risk measures after the announcement, change in systematic risk (ΔSYS), unsystematic risk (ΔUNSYS), and total risk (ΔTOTAL) is computed as:

$$\Delta\text{SYS} = (\beta_j, \text{post}) - (\beta_j, \text{pre})$$

$$\Delta\text{UNSYS} = \text{Var}(\varepsilon_j, \text{post}) - \text{Var}(\varepsilon_j, \text{pre})$$

$$\Delta\text{TOTAL} = \text{Var}(R_j, \text{post}) - \text{Var}(R_j, \text{pre})$$

The daily abnormal returns are computed as the deviation of realized returns from the expected return over the event window of day $t = -30$ to day $t = 30$. The abnormal return for firm j on day t is computed as:

$$AR_{jt} = R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt} \quad (2)$$

The average standardized abnormal return (AAR) for security j on day t is estimated as⁷:

$$AAR_{jt} = \frac{1}{N} \sum_{j=1}^N \frac{R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt}}{S_{jt}} = \frac{1}{N} \sum_{j=1}^N \frac{AR_{jt}}{S_{jt}} \quad (3)$$

The maximum likelihood estimate of standard deviation (S_{jt}) is computed as:

$$S_{jt} = \left[V_j^2 \left[1 + \frac{1}{D} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{k=1}^D (R_{mk} - \bar{R}_m)^2} \right] \right]^{1/2} \quad (4)$$

where,

R_{mt} = market return on the CRSP equal-weighted index in time period t .

R_m = mean market return in the estimation period.

V_j^2 = residual variance of security j .

D = number of days in the estimation period.

N = number of announcements in the sample.

R_{jt} = return on security j for period t .

⁷ For the same sub-samples, daily average excess return (AER) based on equal-weighted market index is also employed for robustness check. The findings are reported in the Appendix section.

The Ordinary Least Squares (OLS) method is used to estimate the market model parameters α and β over the period $t = -250$ days to $t = -30$ days relative to the announcement day. The standardized t statistic is applied to test the hypothesis that standardized average abnormal returns equal zero. In order to make sure that there is no outlier effect, the binomial sign test (B-value) is also employed to test that the proportion of positive (negative) abnormal returns expected under the null hypothesis is 0.50. The B-values are estimated as $(S-PN)/\sqrt{P(1-P)N} \sim N(0,1)$ where N is the number of announcements in the sample, P is the proportion of positive average abnormal returns under the null hypothesis (0.50) and S is the number of positive average residuals (Waheed and Mathur, 1995).

Finally to investigate validity of the size effect, three different sub-samples of joint venture announcing partners are constructed. The sub-samples consist of those firms that are relatively different in size, such as small vs. large, small vs. medium, and medium vs. large. The next step is to analyze the riskiness of the joint venture announcements for the sub-samples. The empirical results and the test statistics are presented in section three.

3. Empirical Results

3.1. Analysis of Abnormal Returns

Panel A in Tables 1 to 6 shows daily standardized average abnormal returns (AAR), the Z -values, number of companies with positive daily average abnormal returns (POSAVG), the proportion of daily average positive abnormal returns (%), sample size (N), and the binomial sign test statistic (B-value) for two-parent joint ventures. The Z -value is the standardized t statistic to test the hypothesis that the daily average abnormal

returns equal zero. The binomial sign test (B-value) is used to test if the proportion of positive abnormal returns in the test period is significantly different from the proportion of positive abnormal returns expected under the null hypothesis (0.50). The binomial sign test is employed to check if a few outliers affect the abnormal returns.

In panel B of Tables 1 to 6, Δ SYs refers to change in systematic risk, Δ UNSYs refers change in unsystematic risk, Δ TOTAL refers to change in total risk, N+ refers to the number of companies for which there is an increase in the risk measures after the joint venture announcement, and N- refers the number of companies for which there is a decrease in the three risk measures after the joint venture announcement. Associated test statistics - the Wilcoxon ranked sign test (Z) and paired t-test - are provided in panel B. The one-tail paired t- test statistic tests whether the mean difference for each measure of risk is different from zero. To check if change in the risk measures Δ SYs, Δ UNSYs, Δ TOTAL, is not due to a few outliers, the Wilcoxon median signed rank test statistics are also presented⁸.

Panel A of Table 1 shows the standardized daily average abnormal returns (AAR) and the associated test statistics for the sample of small size parents when they sign joint venture contract with large size parents. The AAR on the day of announcement is 65 percent, which is significant at the one percent level. This indicates that, the shareholders of the small size partners experience highly significant positive abnormal returns at the time of such announcements when they partner with large size firms. Since 89 (i.e., 59.73 %) of 149 announcements have positive abnormal returns, this finding is not due to a few outlier effects. The announcement day $t = 0$ is the only day on which more than 50

² (see for example, Siegel & Castellan; Nonparametric Statistics, 2nd ed.; p.90).

percent of the small firms observe highly significant positive returns. On day $t = -2$, small firms earn significantly positive 19.8 percent returns. This finding can be attributed to the news leakage effect that the shareholders of some firms may have gained access to the information about the joint venture two days before the announcement. The AARs after the announcement day are negative and not significantly different from zero except for day $t = 5$. On this day, the AAR is negative 18 percent and it is significant at the five percent level.

Table 1: Daily standardized average abnormal returns for the “SMALL” firms in the sample of joint ventures where small firms sign contract with large firms.						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	-0.014	-0.176	71	47.65	149	-0.573
-4	0.014	0.167	68	45.64	149	-1.065
-3	-0.033	-0.397	61	40.94	149	-2.212**
-2	0.198	2.419**	76	51.01	149	0.246
-1	0.122	1.490	76	51.01	149	0.246
0	0.645	7.870***	89	59.73	149	2.376***
1	-0.179	-2.186**	61	40.94	149	-2.212**
2	-0.109	-1.328	60	40.27	149	-2.376**
3	-0.120	-1.467	64	42.95	149	-1.720*
4	-0.007	-0.091	73	48.99	149	-0.246
5	-0.072	-0.874	61	40.94	149	-2.212**
Panel B: Testing the hypothesis that joint venture is a risk-reducing strategy. Significance of the change in risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N⁺	N⁻	Z	p-value	t	p-value
ΔSYS	57	92	-1.70	0.044**	-1.31	0.095*
ΔUNSYS	73	76	-0.11	0.455	-0.19	0.423
ΔTOTAL	73	76	-0.04	0.483	-0.21	0.416

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Panel B of Table 1 reports the test statistics for change in the levels of systematic risk, unsystematic risk, and total risk. Both the t-test and the Wilcoxon ranked-sign test indicate that there is no change in total risk and unsystematic risk. However, the systematic risk has decreased. This shows that small firms experience a lower level of systematic risk when they partner with large firms.

Table 2 shows the results for large firms when they sign joint ventures with small

firms. Panel A shows that the AAR at $t = 0$ is positive 25 percent but not significantly different from zero. The AARs for the other days, except for day $t = -5$, are also not significantly different from zero. The sign test statistic for day $t = 0$ also shows that proportion of firms with positive AAR is not significantly different from 50 percent, indicating that the positive AAR on day $t = 0$ is due to a few outliers in the sample. In Panel B of Table 2, the t-test and the sign test statistics show that large partners also observe lower level of systematic risk and no significant change in the levels of unsystematic and total risk after the announcement. However, lower level of significance indicated by the sign test (10.2 percent significance level) provides weak evidence that large firms experience lower systematic risk after the announcement. The empirical results in Table 1 and Table 2 support the relative size hypothesis that gain from joint ventures is inversely related to the firm size.

Table 2: Daily standardized average abnormal returns for the “LARGE” firms in the sample of joint ventures where large firms sign contract with small firms.						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	-0.365	-1.674*	5	23.81	21	-2.400**
-4	-0.277	-1.270	8	38.10	21	-1.091
-3	0.126	0.577	15	71.43	21	1.964**
-2	-0.099	-0.453	9	42.86	21	-0.655
-1	-0.121	-0.552	10	47.62	21	-0.218
0	0.247	1.130	13	61.90	21	1.091
1	0.094	0.430	12	57.14	21	0.655
2	0.132	0.604	11	52.38	21	0.218
3	0.347	1.588	12	57.14	21	0.655
4	-0.114	-0.524	7	33.33	21	-1.528
5	-0.357	-1.635	5	23.81	21	-2.400**
Panel B: Testing the hypothesis that joint venture is a risk-reducing strategy. Significance of the change in risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N⁺	N⁻	Z	p-value	t	p-value
ΔSYS	10	11	-1.27	0.102*	-1.54	0.069*
ΔUNSYS	11	10	0.23	0.410	0.73	0.238
ΔTOTAL	12	9	0.89	0.187	0.89	0.187

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Table 3 refers to the sample where small size firms enter into joint venture with medium size firms. Panel A shows that small firm's AAR on day $t = 0$ is 51 percent and significant at the 1 percent level. On the other hand, the proportion of firms with positive abnormal return on day $t = 0$ is 58 percent, but not significantly different from 50 percent. However, when small firms enter into joint venture with large firms, the AAR is 65 percent at $t = 0$, which is higher than the case when small firms choose medium size firms to enter into joint venture agreement (51 percent). The results in Panel B show that there is no significant change in systematic, unsystematic, and total risks. This indicates that small firms do not experience any risk-sharing benefits when they joint venture with medium size firms.

Table 3: Daily standardized average abnormal returns for the "SMALL" parent in the sample of joint ventures where small firms sign contract with medium size firms.						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	-0.037	-0.341	39	46.43	84	-0.655
-4	0.161	1.474	42	50.00	84	0.000
-3	0.047	0.429	38	45.24	84	-0.873
-2	0.153	1.406	39	46.43	84	-0.655
-1	0.092	0.839	42	50.00	84	0.000
0	0.507	4.651***	49	58.33	84	1.528
1	0.247	2.261**	39	46.43	84	-0.655
2	0.043	0.396	38	45.24	84	-0.873
3	-0.152	-1.392	42	50.00	84	0.000
4	0.135	1.236	37	44.05	84	-1.091
5	-0.215	-1.971**	37	44.05	84	-1.091
Panel B: Testing the hypothesis that joint venture is a risk-reducing strategy. Significance of the change in risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N⁺	N⁻	Z	p-value	t	p-value
Δ SYs	39	45	1.06	0.145	0.54	0.294
Δ UNSYs	39	45	-0.39	0.349	-0.90	0.184
Δ TOTAL	41	43	0.29	0.387	-0.82	0.207

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Panel A of Table 4 shows the results for medium size firms when they enter into joint venture with small size firms. The AAR at day $t = 0$ is 11.5 percent but it is not significantly different from zero. On day $t = 0$, the AAR for small firms (51%, significant

at the 1% level) is higher than the AAR for medium size firms (12%, not significant). This finding is also another supporting evidence for the relative size hypothesis predicts inverse relationship between the stock market reaction to a joint venture announcement and the firm size relative to its partner. In Panel B of Table 4, both the sign test and t-test statistics show that medium size partners observe decrease in systematic risk. However, the test statistics indicate that medium size firms do not experience any reduction in unsystematic and total risk levels.

Table 4: Daily standardized average abnormal returns for the “MEDIUM” size firms in the sample of joint ventures where medium size firms sign contract with small firms.						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	0.068	0.497	24	45.28	53	-0.687
-4	-0.088	-0.637	23	43.40	53	-0.962
-3	-0.127	-0.924	21	39.62	53	-1.511
-2	-0.122	-0.888	22	41.51	53	-1.236
-1	0.059	0.432	30	56.60	53	0.962
0	0.115	0.836	29	54.72	53	0.687
1	0.147	1.071	29	54.72	53	0.687
2	-0.102	-0.741	26	49.06	53	-0.137
3	-0.107	-0.781	24	45.28	53	-0.687
4	-0.183	-1.335	20	37.74	53	-1.786
5	0.231	1.685*	31	58.49	53	1.236
Panel B: Testing the hypothesis that joint venture is a risk-reducing strategy. Significance of the change in risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N⁺	N⁻	Z	p-value	t	p-value
ΔSYS	20	33	-2.43	0.007***	-2.49	0.008***
ΔUNSYS	27	26	-0.09	0.463	0.20	0.420
ΔTOTAL	27	26	-0.25	0.400	-0.34	0.367

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Table 5 shows the results for medium size firms when they joint venture with large size firms (medium vs. large). The AAR on day t = 0 is 71 percent and significant at the one percent level, indicating that shareholders of the medium size firms experience highly significant positive abnormal returns when they partner with large firms. Since 68 percent of the announcements show positive abnormal returns, this finding cannot be

attributed to any outlier effect. After day $t = 0$, all AARs are negative and not significantly different from zero. In Panel B of Table 5, both test statistics indicate that there is no significant change in all three risk measures, indicating that medium size firms do not experience any risk-sharing benefits when they partner with large firms.

Table 5: Daily standardized average abnormal returns for “MEDIUM” size firms in the sample of joint ventures where medium size firms sign contact with large firms.						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	-0.088	-0.875	45	45.92	98	-0.808
-4	0.079	0.780	53	54.08	98	0.808
-3	-0.057	-0.564	49	50.00	98	0.000
-2	-0.026	-0.254	46	46.94	98	-0.606
-1	-0.017	-0.169	53	54.08	98	0.808
0	0.712	7.047***	67	68.37	98	3.637***
1	-0.037	-0.366	42	42.86	98	-1.414
2	-0.082	-0.813	39	39.80	98	-2.020*
3	-0.072	-0.717	43	43.88	98	-1.212
4	-0.013	-0.127	50	51.02	98	0.202
5	-0.008	-0.080	38	38.78	98	-2.222
Panel B: Testing the hypothesis that joint venture is a risk-reducing strategy. Significance of the change in risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N⁺	N⁻	Z	p-value	t	p-value
Δ SYs	43	55	-1.08	0.141	-0.78	0.219
Δ UNSYs	49	49	0.39	0.349	0.85	0.198
Δ TOTAL	51	47	0.85	0.197	1.04	0.149

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Table 6 shows the results for the sample of joint ventures where large firms partner with medium size firms. On the day of announcement, the AAR is 13.5 percent and not significant. Similarly, all AARs on the other days of the event window are not significantly positive except for day $t = -2$. On this day, the AAR is positive 41 percent and significant at the 10 percent level. However, the sign test shows that proportion of firms with positive AAR is not significantly different from 50 percent, indicating that the positive and significant AAR on day $t = -2$ can be attributed to some outliers. Because the sample size ($n=22$) is not very large, this is probably the most reasonable explanation for this anomaly. The AAR on day $t = 1$ is negative 37 percent and significant at the 10

percent level. On this day, the sign test shows that percentage of firms with positive AAR is significantly less than 50 percent.

Hence, the findings in Table 5 and Table 6 show that large firms earn, on average, insignificant 13.5 percent abnormal return whereas medium size firms earn significant 71 percent abnormal return. Again this shows that the relative size hypothesis holds when medium size parent firms enter into joint ventures with large size firms. In Panel B of Table 6, the test statistics show that large firms experience an increase in all three risk measures, indicating that large firms do not share risk when they partner medium size firms. As shown in Table 5, medium size firms also experience no change in all three risk levels. That is, there is no risk-sharing benefit when joint venture is signed between large and medium size firms.

Table 6: Daily standardized average abnormal returns for “LARGE” firms in the sample of joint ventures where large firms sign contract with medium size firms.						
Panel A						
Day (t)	AAR	Z	POSAVG	%	N	B-value
-5	-0.062	-0.291	9	40.91	22	-0.853
-4	-0.290	-1.360	7	31.82	22	-1.706*
-3	0.146	0.683	15	68.18	22	1.706*
-2	0.414	1.944*	12	54.55	22	0.426
-1	-0.092	-0.430	9	40.91	22	-0.853
0	0.135	0.635	11	50.00	22	0.000
1	-0.374	-1.754*	5	22.73	22	-2.558**
2	0.281	1.319	13	59.09	22	0.853
3	0.108	0.508	11	50.00	22	0.000
4	0.033	0.153	9	40.91	22	-0.853
5	-0.181	-0.849	10	45.45	22	-0.426
Panel B: Testing the hypothesis that joint venture is a risk-reducing strategy. Significance of the change in risks is tested using the t-statistic for means and the nonparametric Wilcoxon signed rank test (Z).						
Risk	N⁺	N⁻	Z	p-value	t	p-value
Δ SYS	16	6	2.26**	0.012	2.40**	0.013
Δ UNSYS	14	8	2.16**	0.015	2.37**	0.013
Δ TOTAL	15	7	2.19**	0.014	2.40**	0.012

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

3.2. Analysis of Market Capitalization

Market Capitalization refers to total market value of a company's outstanding common stocks, calculated as the current stock price multiplied by the number of shares outstanding. It is another way of examining the effects of joint venture announcements on shareholder's wealth. To do this, percentage change in firms' market value for different intervals around the announcement day $t = 0$ is calculated. In this section, joint venturing firms are grouped based on the same criteria described in section 2: small vs. large, small vs. medium, and medium vs. large groups⁹.

Tables 7 to 9 present the results for each sub-sample. In the tables, N refers to sample size for each given interval, N^+ refers to the number of parents with an increase in market value of their common stocks, N^- refers to the number of parents with a decrease in market value of their common stocks, % is for percentage change in market value of common stocks¹⁰. The one-tailed t-test statistic and the associated p-values are used to test the hypothesis that the mean percentage change in market capitalization of relatively smaller parents is significantly greater than that of relatively larger parents.

Table 7 provides the results for the sub-sample where small firms announce joint venture with large firms. For any interval up to the announcement day $t = 0$, the mean percentage gain in market capitalization for small firms is significantly greater than that of large firms. The interval of $[0,2]$ shows that small size firms, on average, experience

⁹ Another way to examine the effects of joint venture announcements on shareholders' wealth, within the context of relative size hypothesis, is to measure cross-sectional average of dollar gains when relatively different size firms sign joint venture contract. Change in market value from day $t = -1$ to day $t = 0$ is also used to measure dollar gains from entering into joint ventures. The results are reported in the Appendix section.

¹⁰ For some intervals, the total sample size (N) may be different from the total number of the firms with positive (N^+) and negative change (N^-) in the market value of common equity. This is because some firms may not observe any change in the market value of their equities during that period of time.

negative 0.2 percent decrease in market value of common stocks whereas large firms gain positive 0.1 percent increase in their market valuation of common stocks. Also, seven trading days after the announcement, interval [0,7], small firms observe no change in market value whereas large firms experience 0.3 percent increase in value. However, the t-test statistics for the intervals after the announcement show that there is no significant difference between small and large size firms in terms of percentage change in market capitalization.

Table 7: Analysis of the change in market capitalization around the announcement day (t=0) for the sample of joint ventures where small size firms sign contract with large size firms.

Interval	N	N ⁺	N ⁻	Small (%)	Large (%)	t-test (one-tail)	p-value
[-30,-7]	417	206	210	3.4	1.5	1.60*	0.054
[-30,0]	417	241	176	10.5	2.1	5.38***	0.000
[-7,0]	409	241	167	7.1	0.5	6.80***	0.000
[-2,0]	409	247	160	4.7	0.1	6.36***	0.000
[0,2]	402	187	212	-0.2	0.1	-0.72	0.237
[0,7]	402	175	226	0	0.3	-0.39	0.347

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively.

Table 8 presents the results for the joint the small firms when they joint venture with medium size firms. Again, for any interval up to the announcement day, mean percentage gain in market capitalization for small firms is significantly greater than mean percentage gain in market capitalization for medium size firms. For the interval of [0,2], there is no significant difference between medium and large size firms' percentage gain. Moreover, mean percent change in each parent's market capitalization separately is also not significantly different from zero¹¹. Interval of [0,7] shows that large firms, on average, experience positive 1.04 percent increase in market capitalization whereas

¹¹ The t-test statistics to test for the hypothesis that mean percent change in market capitalization is different from zero are not reported but significance levels, if significant, are marked on the summary table presented in the appendix.

medium size firms experience negative 0.05 percent decrease. This difference is significant at the 5 percent level.

Table 8: Analysis of the change in market capitalization around the announcement day (t=0) for the sample of where small size firms sign contract with medium size firms.

Interval	N	N ⁺	N ⁻	Small (%)	Medium (%)	t-test (one-tail)	p-value
[-30,-7]	380	192	187	4.5	1.7	1.89**	0.029
[-30,0]	380	211	168	10.6	2.1	4.17***	0.000
[-7,0]	373	225	147	6	0.7	3.99***	0.000
[-2,0]	378	227	150	4.3	0.7	3.35***	0.000
[0,2]	383	180	199	0.53	0.55	-0.03	0.487
[0,7]	383	176	206	-0.05	1.04	-1.76**	0.039

***, **, * indicates significance at the 1%, 5% or 10% levels, respectively..

Table 9: Analysis of the change in market capitalization around the announcement day (t=0) for the sample of joint ventures joint ventures where medium size firms sign contract with large size firms.

Interval	N	N ⁺	N ⁻	Medium (%)	Large (%)	t-test (one-tail)	p-value
[-30,-7]	419	217	202	3.8	1.1	2.29***	0.011
[-30,0]	419	237	182	6.9	1.7	3.72***	0.000
[-7,0]	432	252	180	3.2	0.7	3.99***	0.000
[-2,0]	437	255	181	1.9	-0.002	5.83***	0.000
[0,2]	451	214	237	-0.03	-0.008	-0.06	0.475
[0,7]	451	198	253	-0.2	0.08	-0.56	0.289

***, **, * Indicates significance at the 1%, 5% or 10% levels, respectively.

Table 9 is for the sub-sample where medium size firms announce joint venture with large firms. For each interval up to the announcement day, small firms gain more than large firms in terms of percentage change in their caps. Medium size firms loose - 0.03 percent and -0.2 percent in value during the intervals of [0,2] and [0,7], respectively. On the other hand, for the same intervals, large firms loose -0.008 % during the interval of [0, 2] and gain 0.08 percent in value during the interval of [0,7]. However, these

gains/losses in market value are not significantly different from zero for both medium and large size parents.

For all sub-samples, the above mentioned-results consistent with the expectation are indicative of positive market reaction to a relatively smaller firm's joint venture announcement. This may be due to "synergistic" gains resulting from sharing complementary skills and assets (McConnell and Nantell, 1985), or due to anticipation that joint ventures provide small firms access to resources from which they may otherwise be excluded, or due the validation of smaller firm by its larger partner that sends positive signal to the market about small firm's strength and potentials (Mohanram and Nanda, 1996).

4. Conclusion

This study finds very strong empirical evidence for the relative size hypothesis predicts that the stock market reaction to a joint venture announcement is inversely related to firm size relative to its partner. To test the relative size hypothesis in joint ventures, joint venture parents are categorized as "small", "medium" or "large" size parents in the joint venture according to their market capitalization rankings. Then, these firms are matched with their partners to construct three sub-samples in which small firms partner with large firms, small firms partner with medium size firms, and medium size firms partner with large size firms in a joint venture agreement.

For all three sub-samples, the abnormal return analysis based on the market model parameter estimates shows that, shareholders of smaller firms earn highly significant and larger abnormal returns on the announcement day, between approximately 51% and 71%. However, shareholders of relatively larger firms in all three sub-samples experience

positive but not significant abnormal returns at the time of such announcements, between 12% and 25%. The largest abnormal return on the day of announcement (71%) is observed for medium size firms when they enter into joint venture with large firms, and the smallest abnormal return on the announcement day (12%, not significant) is observed for medium size firms when they enter into joint ventures with small firms. Since the binomial sign test statistics show that proportion of relatively larger firms in all sub-samples is not significantly different from 50 percent, the abnormal return figures for relatively large firms can also be attributed to some outliers. Therefore, the empirical findings evidence that abnormal returns based on the market model support the relative size hypothesis

The support for the relative size hypothesis is also found when the market capitalization analysis is used. The specific intervals, $[-30, 0]$, $[-7, 0]$, and $[-2, 0]$, show that the percentage gain in market capitalization is significantly greater for relatively smaller firms as compare to relatively larger firms- approximately between 3.4% and 10.6 % for relatively smaller firms, and between -0.002% and 2.1% for relatively larger firms. After the announcement, the change in market capitalization is not significantly different from zero for firms of any size in all three sub-samples.

The risk analysis between small and large size parents shows that the systematic risk for both parents decreases while unsystematic and total risk levels remain the same. Secondly, when the joint venture occurs between small and medium size parents, the medium size parent benefits from a lower level of systematic risk while the small parent displays no change in systematic risk. Both small and medium size parents do not observe any change in unsystematic and total risks. Finally, in the case medium and large

size parents, medium firms show no change in all three risk measures large firms observe increases in all three risk measures.

Appendix 2

A1. Summary of Tables 1 to 9 Presented in Section 3 of Chapter 2.

Table A1: Summary of abnormal returns and risk analysis for each joint venture category						
Panel A						
Variables	Joint venture categories based on relative size of the parents					
	Small (n=149)	vs. Large (n=21)	Small (n=84)	vs. Medium (n=53)	Medium (n=98)	vs. Large (n=22)
AAR (t=0) Significant?	0.645 yes	0.247 No	0.507 yes	0.115 no	0.712 yes	0.135 no
Δ SYS	Decrease	Decrease ♠	No change	Decrease	No change	Increase
Δ UNSYS	No change	No change	No change	No change	No change	Increase
Δ Total	No change	No change	No change	No change	No change	Increase
Panel B: Mean percentage change in market capitalization for each partner in each joint venture category						
Interval	Small (%)	vs. Large (%)	Small (%)	vs. Medium (%)	Medium (%)	vs. Large (%)
[-30, -7]	3.4***	1.54***	4.5***	1.7***	3.8***	1.1**
[-30, 0]	10.5***	2.07***	10.6***	2.1***	6.9***	1.7**
[-7, 0]	7.1***	0.46**	6***	0.65*	3.2***	0.65**
[-2, 0]	4.7***	0.10	4.3***	0.7***	1.9***	-0.002
[0, 2]	-0.2	0.08	0.53	0.55**	-0.03	-0.01
[0, 7]	0.002	0.28	-0.05	1.04***	-0.2	0.08

***, **, * indicates significance at the 1%, 5%, or 10% levels, respectively.

♠ the p-value for the sign test is 10.2 percent.

A2. Cross-sectional Average of Dollar Gains

Table A2: Dollar gains on the day of announcement (t = 0) relative to one day before the announcement day (t = -1) for different sub-samples where same size firms and relatively different size firms establish joint ventures.						
Panel A: Dollar gains for relatively different size firms when they establish joint ventures.						
Joint Venture Category	Sample	N	Mean (000s)	Mean%	Median	Median %
Small vs. Large	Small	149	\$1,675	3.52	\$490	0.89
	Large	21	\$33,367	0.38	\$35,889	0.33
Medium vs. Large	Medium	98	\$15,109	2.1	\$6,809	0.79
	Large	22	\$26,553	0.33	\$-13,323	-0.22
Small vs. Medium	Small	84	\$1,181	2.63	\$116	0.87
	Medium	53	\$726	0.77	\$3,083	0.89
Panel B: Dollar gains for the sub-samples where same size firms establish joint ventures.						
Medium vs. Medium	MM	72	\$9,388	1.58	5,931	0.84
Small vs. Small	SS	120	\$566	2.21	0	0
Large vs. Large	LL	48	\$-784	-0.43	-2,685	-0.04

Another way to assess the effects of joint venture announcements on shareholder wealth within the context of relative size hypothesis is to measure cross-sectional average of dollar gains. The dollar gain for each security is measured by the change in market value of stocks from day t = -1 to announcement day t = 0. Table A2 shows mean dollar gains, median dollar gains, mean percentage dollar gain (mean%) and the median of percentage dollar gains in market value (median%). The results in Panel A show that the mean percentage gain in market value is greater for relatively smaller partners, supporting the relative size hypothesis. Panel A also shows that the mean dollar gains for relatively smaller partner is less than that of relatively larger partner except for small size firms that establish joint venture with medium size firms. But again medium size firms have larger median dollar gain than that of small size firms. Overall, however, relatively

larger dollar gain associated with relatively much smaller mean percentage gain in market value is a result of the sample that includes very large firms.

A3. Daily Average Excess Returns (AER) Based on Equal-weighted Market Index

Table A3: Daily average excess returns (AER) based on equal-weighted market index on the day of announcement (t = 0) for different sub-samples where same size and relatively different size firms establish joint ventures.						
Panel A: Daily average excess returns for relatively different size firms						
Joint venture category	Sample	N	AER	Std dev	t-value	p-value
Small vs. Large	Small	149	0.034***	0.099	4.14	0.000
	Large	21	0.003	0.016	0.99	0.335
Medium vs. Large	Medium	98	0.021***	0.056	3.61	0.001
	Large	22	0.003	0.017	0.79	0.439
Small vs. Medium	Small	84	0.022***	0.069	2.93	0.004
	Medium	53	0.005	0.029	1.23	0.223
Panel B: Daily average excess returns and associated t-test statistics for the same size firms.						
Medium vs. Medium	MM	72	0.014***	0.037	3.13	0.003
Small vs. Small	SS	120	0.022***	0.081	2.91	0.004
Large vs. Large	BB	48	-0.002	0.022	-0.74	0.465

Panel A of Table A3 presents daily average excess returns (AERs) based on equal-weighted market index for samples where relatively different size firms establish joint ventures. For all three joint venture categories (small-large, small-medium, and medium-large), the findings show that relatively smaller firms earn, on average, significantly positive and higher excess returns on the announcement day (t = 0). On the other hand, AERs for relatively larger firms are not significantly different from zero. Even though the magnitudes of excess returns based on equal-weighted market index are

different from abnormal returns based on the market model estimates, direction of the results did not change. That is, the relative size hypothesis is supported by both market excess returns (AERs) based on equal-weighted market index and abnormal returns (AARs) based on the market model estimates. Panel B shows findings for samples where same size firms (small-small, medium-medium and large-large) establish joint ventures. The AERs for both medium and small joint venture groups are positive and significant. However, the AER is negative (-0.002) and not significant when a large size firm establishes joint venture with another large size firm.

A4. Daily Average Excess Returns Based on Equal-weighted Market Index for the Same Sub-samples Presented in Tables 1 to 6 in Section 3 of Chapter 2.

Table A4: Daily average excess returns based on equal-weighted market index for “SMALL” firms in the sample of joint ventures where small size firms sign contract with large size firms.						
Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	0.005	1.190	69	46.31	149	-0.901
-4	0.000	-0.076	71	47.65	149	-0.573
-3	0.000	0.017	64	42.95	149	-1.720*
-2	0.007*	1.824	78	52.35	149	0.573
-1	0.007	1.163	74	49.66	149	-0.082
0	0.034***	4.144	91	61.07	149	2.703***
1	-0.008*	-1.693	58	38.93	149	-2.703***
2	-0.004	-1.039	64	42.95	149	-1.720*
3	-0.007	-1.468	65	43.62	149	-1.557
4	0.004	0.665	69	46.31	149	-0.901
5	-0.008*	-1.806	59	39.60	149	-2.540**

Table A5: Daily average excess returns based on equal-weighted market index for “LARGE” firms in the sample of joint ventures where large size firms sign contract with small size firms.						
Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	-0.004	-1.301	7	33.33	21	-1.52
-4	-0.003	-0.885	7	33.33	21	-1.528
-3	0.002	0.641	13	61.90	21	1.091
-2	-0.003	-0.763	9	42.86	21	-0.655
-1	0.000	-0.001	10	47.62	21	-0.218
0	0.003	0.988	13	61.90	21	1.091
1	0.002	0.529	11	52.38	21	0.218
2	0.003	0.835	12	57.14	21	0.655
3	0.005	1.006	11	52.38	21	0.218
4	-0.002	-0.595	7	33.33	21	-1.528
5	-0.006**	-2.283	7	33.33	21	-1.528

Table A6: Daily average excess returns based on equal-weighted market index for “SMALL” firms in the sample of joint ventures where small firms sign contract with medium size firms.						
Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	-0.004	-0.794	38	45.24	84	-0.873
-4	0.007	1.223	39	46.43	84	-0.655
-3	0.006	0.737	34	40.48	84	-1.746
-2	0.005	1.082	39	46.43	84	-0.655
-1	0.000	0.074	39	46.43	84	-0.655
0	0.022***	2.926	48	57.14	84	1.309
1	0.011	1.492	39	46.43	84	-0.655
2	-0.001	-0.152	37	44.05	84	-1.091
3	-0.006	-0.890	37	44.05	84	-1.091
4	0.006	0.968	36	42.86	84	-1.309
5	-0.008	-1.532	33	39.29	84	-1.964

Table A7: Daily average excess returns based on equal-weighted market index for “MEDIUM” firms in the sample of joint ventures where medium firms sign contract with small size firms.

Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	0.002	0.402	24	45.28	53	-0.687
-4	-0.001	-0.229	23	43.40	53	-0.962
-3	-0.005	-1.564	20	37.74	53	-1.786
-2	-0.002	-0.551	23	43.40	53	-0.962
-1	0.002	0.590	28	52.83	53	0.412
0	0.005	1.234	28	52.83	53	0.412
1	0.004	0.871	30	56.60	53	0.962
2	0.000	-0.033	26	49.06	53	-0.137
3	-0.001	-0.275	23	43.40	53	-0.962
4	-0.005	-1.424	19	35.85	53	-2.060
5	0.008**	2.563	30	56.60	53	0.962

Table A8: Daily average excess returns based on equal-weighted market index for “MEDIUM” firms in the sample of joint ventures where medium firms sign contract with large size firms.

Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	-0.001	-0.402	43	43.88	98	-1.212
-4	0.003	1.332	52	53.06	98	0.606
-3	-0.001	-0.596	46	46.94	98	-0.606
-2	0.000	-0.024	46	46.94	98	-0.606
-1	0.000	-0.131	54	55.10	98	1.010
0	0.021***	3.607	67	68.37	98	3.637
1	0.000	0.006	44	44.90	98	-1.010
2	0.000	-0.204	40	40.82	98	-1.818
3	0.000	-0.147	47	47.96	98	-0.404
4	0.001	0.318	50	51.02	98	0.202
5	-0.001	-0.281	41	41.84	98	-1.616

Table A9: Daily average excess returns based on equal-weighted market index for “LARGE” firms in the sample of joint ventures where large firms sign contract with medium size firms.

Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	-0.001	-0.215	10	45.45	22	-0.426
-4	-0.005*	-1.839	8	36.36	22	-1.279
-3	0.002	0.821	13	59.09	22	0.853
-2	0.007*	1.737	12	54.55	22	0.426
-1	0.000	0.042	11	50.00	22	0.000
0	0.003	0.788	10	45.45	22	-0.426
1	-0.008*	-1.743	6	27.27	22	-2.132
2	0.004	0.869	13	59.09	22	0.853
3	0.003	1.050	14	63.64	22	1.279
4	0.000	0.103	9	40.91	22	-0.853
5	-0.001	0.054	10	45.45	22	-0.426

Table A10: Daily average excess returns based on equal-weighted market index for “SMALL” firms in the sample of joint ventures where small firms sign contract with small size firms.

Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	-0.002	-0.297	59	49.17	120	-0.183
-4	0.000	0.032	60	50.00	120	0.000
-3	0.003	0.573	52	43.33	120	-1.461
-2	0.000	-0.078	61	50.83	120	0.183
-1	0.001	0.134	51	42.50	120	-1.643
0	0.022***	2.912	62	51.67	120	0.365
1	0.008	1.566	65	54.17	120	0.913
2	0.005	0.860	57	47.50	120	-0.548
3	0.005	1.026	54	45.00	120	-1.095
4	-0.002	-0.627	48	40.00	120	-2.191
5	0.000	-0.057	47	39.17	120	-2.373

Table A11: Daily average excess returns based on equal-weighted market index for “MEDIUM” firms in the sample of joint ventures where medium size firms sign contract with medium size firms.

Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	-0.006**	-1.996	27	37.50	72	-2.121
-4	0.002	0.542	34	47.22	72	-0.471
-3	-0.002	-0.758	30	41.67	72	-1.414
-2	0.004	1.064	39	54.17	72	0.707
-1	-0.001	-0.350	33	45.83	72	-0.707
0	0.014***	3.131	43	59.72	72	1.650
1	0.001	0.339	40	55.56	72	0.943
2	-0.007*	-1.930	29	40.28	72	-1.650
3	0.000	-0.037	33	45.83	72	-0.707
4	0.003	0.816	38	52.78	72	0.471
5	-0.001	-0.445	33	45.83	72	-0.707

Table A12: Daily average excess returns based on equal-weighted market index for “LARGE” firms in the sample of joint ventures where large size firms sign contract with large size firms.

Day (t)	AER	t-value	POSAVG	%	N	B-value
-5	-0.004	-1.213	22	45.83	48	-0.577
-4	0.004	1.310	27	56.25	48	0.866
-3	0.004	0.680	23	47.92	48	-0.289
-2	0.003	0.579	26	54.17	48	0.577
-1	-0.007*	-1.729	19	39.58	48	-1.443
0	-0.002	-0.737	22	45.83	48	-0.577
1	0.001	0.414	22	45.83	48	-0.577
2	-0.005	-1.448	20	41.67	48	-1.155
3	0.001	0.250	23	47.92	48	-0.289
4	-0.004	-0.855	21	43.75	48	-0.866
5	-0.006	-1.278	13	27.08	48	-3.175

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Chapter 3: Third Essay:

**The Relationship between Industry Concentration and Mode of
Expansion: The Case of Joint Ventures and IPOs**

Abstract

This study aims at examining the effects of industry concentration on the choice of expansion modes, IPO vs. JV. The literature related to this study can be partitioned into two groups. The first group focuses on the ownership choice between JV and wholly-owned subsidiary modes of entry. On the other hand, the second group studies the effects of IPO announcements on rival firms within the same industry. However, there has not been any study on the choice of expansion mode between joint ventures and IPOs under different degrees of industry concentration. For this, two different hypotheses are developed and tested: The first hypothesis states that when target industry is highly concentrated, the preferred mode of expansion should be joint venture. The second hypothesis states that when negative competitive effects are stronger than positive information effects, IPO firms will choose highly concentrated industry. This study finds empirical support for the second hypothesis but not for the first one. The empirical findings show that both IPO and joint venture companies tend to choose highly concentrated industries. The welfare effect of both IPO and joint venture announcements on shareholders' wealth is also examined. The findings document that in the longer time period, cumulative average excess return for IPO firms is significantly greater than cumulative average excess return for joint venture firms.

Chapter 3: The Relationship between Industry Concentration and Mode of Expansion: The Case of Joint Ventures and IPOs

1. Introduction

The main objective of this paper is to investigate the industry effect on the choice of expansion mode between joint ventures and IPOs. The vast majority of previous studies has focused on the mode of entry¹² into foreign markets (Anderson and Coughlan, 1986; Anderson and Gatignon, 1986; Kogut and Singh, 1988; Hennart, 1991; Hennart and Larimo, 1998; Buckley and Casson, 1998; Makino and Neupert, 2000; Brouthers and Brouthers, 2000). Those studies have extensively used transaction costs theory to explain the ownership choice between joint venture and wholly-owned subsidiary (WOS) modes of entry. This literature suggests that a joint venture should be the preferred mode of entry to a wholly-owned subsidiary when joint venture is used to combine complementary inputs held by two separate firms, and when the market for both inputs has high transaction costs. The transaction costs theory posits that when the desired assets can not be separated from unwanted ones, and when a complete takeover increases management costs by generating adverse impact on management team's incentive in the acquired firm to maximize the residual, forming a joint venture to obtain the right to use the assets is more efficient than complete takeover. It would be more costly to obtain the necessary assets through replication or full acquisition (Hennart, 1991).

¹² Choice of entry mode refers to the initial preferences of MNEs when they decide to enter into foreign markets. The literature usually classifies entry mode choice decisions according to the amount of equity invested. Usually joint ventures and wholly-owned subsidiaries (e.g., acquisitions and greenfield investments) represent equity market entries. Generally amount of equity invested determines the degree of control and the mode of entry into foreign markets.

Another body of literature studies the impact of IPO announcements on rivals within the same industry. In general, these studies find that the impact of IPO announcement on rivals is related to firm and industry characteristics. Majority of the studies in this area concentrates on industry concentration in determining the direction and magnitude of rivals' reaction to IPO announcements. There is a limited amount of study exists regarding the impact of IPO announcements on rival firms within the same industry. Slovin, Sushka and Ferarro (1995) examine the announcement effects of carve-outs (initial public offerings of subsidiary equity), spin-offs and asset sell-offs on rival firms within the same industry and they find that rivals react negatively to IPO announcements.

Stoughton, Wong, and Zechner (2001) use product market explanation for a firm's decision to go public (e.g., internet IPOs are not considered as product market IPOs). Their findings suggest that that only better quality firms will choose to go public. Consumers will perceive a product market IPO as a positive signal about the quality of IPO product. This is going to have negative effect on rival firms' profits, since they are going to charge lower prices for relatively lower quality products. This is especially more important in less concentrated industries in which competitive factors play a major role for long-term success. This prediction suggests that an IPO announcement in a low concentration industry is going to have negative effect on rival firms. Cotei, Farhat, and Mukherje (2004) study informational externalities of IPO announcements on publicly traded firms in the same industry. Their findings suggest that venture backed IPOs convey positive informational externalities about the industry¹³. The results show that rivals have positive valuation effects only in response to venture backed IPOs and no

¹³ Venture backed IPO refers to IPO funded by venture capitalists

significant reaction in response to non-venture backed IPOs. They also report that wealth effects on rivals in low concentrated industries are positively related to the size of the IPO. Akhigbe, Borde and Whyte (2003) examine whether an industry effect exists for initial public offerings. They examine the effects of initial public offerings on rival firms under two categories i) positive information effects ii) negative competitive effects. Their findings indicate that degree of concentration is inversely related to rival valuation effects, that is, rival firms in less concentrated (more competitive) industries are exposed to more severe competitive effects. Additional capital raised by the IPO firm is considered as a threat to rivals in industries with low degree of concentration. They also find that large IPOs in less concentrated industries have the strongest competitive effects. However, they conclude that information effects and competitive effects are offsetting, that is, rivals' reaction to IPO announcement is insignificant due to offsetting information and competitive effects.

The literature is lacking in two important areas (in addition to mixed results on announcement effects of IPOs). First, to my knowledge, there has not been any study on the choice of ownership between joint ventures and IPOs. Second, the previous studies mentioned earlier do not provide any explanation for industry concentration effects on the choice of expansion mode between joint ventures and IPOs. They do, however, study industry characteristics (level of concentration to be more specific) to determine rival's reaction to IPO announcements only.

Industry concentration is also another factor that may affect the probability that a firm will form a joint venture to have access to resources for expansion. The higher the degree of concentration (less competitive), the greater the adverse impact on new entrants

through IPO and the greater the probability that firms will choose joint venture expansion mode. Because contracting a joint venture agreement with an existing large parent firm in a highly concentrated industry will be less opposed by other established rival firms in the same industry. Even if there happens to be some adverse reaction to new augmented market power resulting from new venture strategy, these negative reactions are going to be “co-opted” by parent firms (Kogut, and Singh, 1988). When an industry is controlled by a few large firms (highly concentrated industry), new entrants are going to be intimidated and discouraged by existing big rivals from entering the industry (Caves, 1981). Therefore firms are going to be reluctant to choose IPO as a mode of expansion through public equity markets. Given the reluctance of these firms toward IPO, joint ventures then may be the preferred mode of entry into highly concentrated industries.

As an attempt to fill the above gaps in the literature, this paper aims at testing following two hypotheses:

Hypothesis 1: When concentration in the target industry is high, the preferred mode of expansion is joint venture.

Hypothesis 2: If negative competitive effects are stronger than positive information effects, IPO firms tend to choose industries with high concentration level.

Additionally, the effects of IPO and JV announcements on shareholders’ wealth are also studied. For this, daily average excess returns and cumulative average excess returns for both IPO and JV companies are used to test for welfare effects. The results are presented in section three. The rest of this paper is organized as follows: Data and methodology are presented in section two; empirical results and test statistics are in section three, and conclusion of the paper is in section four.

2. Data and Methodology

2.1. Excess Return Analysis

The IPO sample covers the period of 1993 – 2002. The joint venture sample for this study is composed of companies engaged in only two-parent joint ventures over the period of 1993 – 2002 to be consistent with the IPO sample. The sample for both joint venture and IPO announcing companies was taken from the Securities Corporation Platinum Database.

In the initial joint venture sample, four-digit SIC and CUSIP numbers for both parents and four-digit SIC numbers for joint venture were available. To study the effects of IPO and JV announcements on shareholders' wealth, IPO and JV announcing companies are limited to those companies whose excess returns are available on the Center for Research in Security Prices (CRSP). For that reason, CUSIP numbers in the original JV sample were merged with PERMNOs (permanent numbers identifying the companies) available in CRSP to be able to get excess returns data. These requirements were not needed for the IPO sample because it already had the PERMNOs and the dates of announcements.

To be consistent with the IPO sample, only first time joint venture announcing firms were included in the final sample. If a company had more than one joint venture announcement, only the first announcement date was included in the sample. This process resulted total number of 881 companies that announced JV for the very first time during the period of 1993 to 2002. Moreover, for the excess returns analysis, firms must have 181 days of excess returns available, days $t = 0$ to $t = +180$, to be included in the joint venture sample. Final joint venture sample has 658 companies that met all the

criteria for excess returns analysis. Since returns data for IPO companies are not available in CRSP on the announcement day ($t = 0$), companies must have 180 non-missing excess return data available starting from one day after the announcement day ($t = 1$ to $t = 180$) to be included in the final IPO sample. Among all IPO companies, 4215 companies met the criteria to be included in the final IPO sample. Distribution of the IPO and JV announcements based on 38 industry groups is presented in the Appendix 3. The 38 industry groups are obtained from Kenneth French's website.

2.2. Industry Concentration Analysis

The Herfindahl Index (HI) is used as a measure for industry concentration. It has two advantages. First, it takes into account of all firms in an industry. Secondly, it gives more weight to firms with large market shares than to small firms with small market shares, to provide a better indication of the relative market control of the largest firms than can be found with the four-firm and eight firm concentration ratios¹⁴.

The HI is defined as the sum of the squares of the market shares of each individual firm:

$$HI = \sum_{i=1}^n (s_i)^2$$

where n is the number of firms in the industry with same four-digit SIC code, and s_i is the market share of firm i , and n is the number of firms in the market. Market share of an individual firm is the fraction of an industry's total sales accounted for by a single

¹⁴ For example: If there are six firms in an industry and each one has 15 percent market share, the Herfindahl index is 1360. However, if one firm has 80 percent market share and remaining five firms have 2 percent each, then the Herfindahl index is 6430. Here it is assumed that the remaining 10% is divided among 10 equally sized firms. On the other hand, the six-firm concentration ratio is 90 percent for both cases. The Herfindahl index for these two cases shows the lack of competition in the second case very clearly. This is due to the fact that the market shares are squared prior to being summed, giving additional weight to firms with larger size.

company in the same industry. The index is calculated for each SIC code available in Research Insight by using annual sales data from S&P's Research Insight for the period of 1993 to 2002. The value of the HI is between 0 and 1 (or between 1000 and 10000). The U.S. Department of Justice uses HI to decide if a merger is anticompetitive or not. An HI less than 0.10 (or 1000) indicates a relatively un-concentrated industry, and the Department of Justice likely would not consider a proposed transaction (e.g., merger) that would leave the industry with HI in that range as anti-competitive. An HI between 0.1 and 0.18 (or between 1000 and 1800) represents moderately concentrated market, and the Department of Justice likely would closely evaluate the competitive impact of a merger that would result in HI in that range. Markets having an HI greater than 0.18 (or greater than 1800) are considered to be highly concentrated. Transactions that increase the HI by more than 100 points in highly concentrated markets generally provoke scrutiny, although this varies from case to case¹⁵.

The year for which index number is calculated is the calendar year in which joint venture or IPO is announced. Among 881 companies that announced joint venture for the first time in different industries, only 726 of them had matching SIC codes and HI numbers calculated by using sales data from S&P's Research Insight. However, for robustness check, an analysis of all announcements in the original two-parent joint sample during the period of 1993 to 2002, regardless of their first or subsequent announcements, are also conducted and results are presented appendix 3. And among 4272 IPO announcements, 2497 of them had matching SIC and HI numbers available for this analysis.

¹⁵ For more information see Horizontal Merger Guidelines issued by the Department of Justice and Federal Trade Commission

3. Empirical Results

3.1. Excess Return Analysis

One sample t-test is applied to test if daily average excess returns (AER) are significantly different from zero. Table 1 shows that on the day of announcement ($t = 0$) AER for JV announcing firms is 2.49 percent and it is highly significantly different from zero. AER for the second day is 0.25 percent and it is not significantly different from zero. For the other days, AER is negative and not significantly different from zero except when $t = 6$, it is significantly negative (-0.38 percent). The findings for IPO sample show that AER at $t = 0$ is 0.2 percent and it is significant at 10 percent significance level, which is a lower significance level compare to significance of AER for joint venture sample on day $t = 0$.

Table 1: Daily average excess returns (AER) and t-test statistics for IPOs and Joint ventures.						
	JV (N=658)			IPO (N=4215)		
Days	AER	t-test	p-values	AER	t-test	p-values
0	0.0249***	8.098	0.0000	-	-	-
1	0.0025	1.134	0.2572	0.00203*	1.765	0.0776
2	-0.0010	-0.465	0.6421	-0.00223**	-2.522	0.0117
3	-0.0030	-1.436	0.1515	-0.00291***	-3.560	0.0004
4	-0.0006	-0.287	0.7741	-0.00056	-0.662	0.5081
5	-0.0003	-0.136	0.8917	-0.00244***	-3.018	0.0026
6	-0.0038**	-2.171	0.0303	-0.00095	-1.215	0.2245
7	-0.0012	-0.582	0.5606	0.00037	0.465	0.6420
8	-0.0004	-0.173	0.8627	0.00126	1.589	0.1122
9	-0.0022	-1.315	0.1891	0.00126	1.472	0.1412
10	-0.0024	-1.392	0.1645	0.00106	1.274	0.2029
11	-0.0009	-0.484	0.6287	0.0015**	1.966	0.0494
12	-0.0005	-0.214	0.8304	0.0013	1.620	0.1054

***, **, * indicates significance at 1%, 5% or 10% levels, respectively.

Table 1 also shows that AERs for IPO sample are negative and significantly different from zero for days $t = 2, 3$ and 5. Other days they are not significant except when $t = 11$,

it is 0.15 percent and significant at 5 percent significance level. These results show that announcement effect is greater for joint venture announcing firms. However, positive and significant announcement effects disappear after announcement day.

The same analysis is applied to the cumulative average excess returns (CER) for both JV and IPO samples. The CERs are from CRSP and they are based on equally weighted market index. The results are shown in Table 2. For JV sample, CERs are all positive and significantly different from zero on days $t = 0$ to 9. After 10th day ($t = 10, 11$ and 12), CERs are positive but not significantly different from zero. On the other hand, the CER for IPO companies is positive and significantly different from zero (0.16 percent). However, after IPO announcement day, CERs are negative and significantly different from zero (except for negative and insignificant CERs on days $t=11$ and $t=12$).

Table 2: Daily cumulative average excess returns (CER) and t-test statistics for IPOs and Joint ventures.						
	JV (N=658)			IPO (N=4215)		
Days	CER	t-test	p-values	CER	t-test	p-values
0	0.0249***	8.098	0.0000	-	-	-
1	0.0274***	6.956	0.0000	0.0016	1.391	0.1642
2	0.0264***	5.668	0.0000	-0.0005	-0.344	0.7310
3	0.0220***	4.991	0.0000	-0.0037**	-2.219	0.0266
4	0.0203***	4.544	0.0000	-0.0046*	-2.529	0.0115
5	0.0193***	4.214	0.0000	-0.0074***	-3.783	0.0002
6	0.0149***	3.184	0.0015	-0.0086***	-4.167	0.0000
7	0.0137***	2.645	0.0084	-0.0089***	-3.999	0.0001
8	0.0122**	2.290	0.0223	-0.0073***	-3.170	0.0015
9	0.0101*	1.770	0.0772	-0.0060**	-2.420	0.0156
10	0.0073	1.263	0.2072	-0.0049*	-1.864	0.0624
11	0.0054	0.946	0.3443	-0.0031	-1.118	0.2636
12	0.0048	0.793	0.4279	-0.0018	-0.601	0.5481

***, **, * indicates significance at 1%, 5% or 10% levels, respectively.

The results in Table 2 show that during the twelve trading days after the announcement, joint venture announcing firms have positive average cumulative excess returns whereas

IPO announcing firms have negative average cumulative excess returns. To analyze and compare welfare effects of IPO and JV announcements on shareholders in a longer time period, cumulative average excess returns over 180 days after the announcements and test statistics are presented in Table 3. In Table 3, day $t = 0$ is announcement day for JV sample but it refers to first day of trading for IPO sample. The reason for this is that there is no data available in the CSRP on the day of IPO announcement ($t = 0$). But number of trading days is 180 for both samples ($t = 0$ to $t = 179$ for JV sample and $t = 1$ to $t = 180$ for IPO sample). The results show that during the first seven days of trading, interval of [0,6], JV sample with positive 1.5 percent CER outperforms the IPO sample with negative 0.86 percent CER. However, after seven trading days, IPO firms have positive and significant excess returns except for the interval [0,179].

Table 3: Cumulative average excess returns (CER) and t-test statistics for IPOs and Joint ventures.							
		Joint Ventures (N=658)			IPO (N=4215)		
Days		CER	t-test	p-values	CER	t-test	p-values
0	1 day	0.025***	8.10	0.0001	0.0016	1.39	0.1642
[0,1]	2 days	0.027***	6.96	0.0001	-0.0005	-0.34	0.7310
[0,6]	7 days	0.015***	3.18	0.0015	-0.0086***	-3.99	0.0001
[0,13]	14 days	0.003	0.40	0.6857	0.0056*	1.76	0.0779
[0,20]	21 days	-0.001	-0.14	0.8884	0.0248***	6.16	0.0000
[0,29]	30 days	-0.002	-0.25	0.8025	0.0205***	4.42	0.0001
[0,59]	60 days	-0.010	-0.70	0.4828	0.0392***	5.22	0.0000
[0,119]	120 days	-0.011	-0.42	0.6733	0.0261**	2.27	0.0230
[0,179]	180 days	-0.005	-0.17	0.8618	-0.0232*	-1.83	0.0673

***, **, * indicates significance at 1%, 5% or 10% levels, respectively.

This finding is consistent with the “speculative bubble hypothesis”. Bubbles arise when stocks consistently sell at prices in excess of its fundamental value. Under the speculative bubble hypothesis, high positive abnormal returns are attributed to speculative behaviors

of investors. For instance, when investors do not behave rationally, they over-react to the information generated by IPOs. As a result, an elevated demand for a new issue of an IPO could be due to over-optimistic behavior demonstrated by irrational investors. This creates a speculative bubble temporarily pushing stock price above its intrinsic value. Therefore, the speculative bubble hypothesis implies that relatively high positive excess returns in the short should be followed by negative long run excess returns as the bubble bursts later in the future. The CERs for both JV and IPO samples are presented graphically in appendix 3.

The independent samples t-test is used to test whether the means of average excess returns and cumulative average excess returns for JVs and IPOs are different. The test results are shown in Table 4.

Table 4: Testing for mean difference between AER and CER for JVs and IPOs.					
Variable	N	Expansion Mode	Mean	t-test	p-value
AER	180	IPO	0.0001	-0.99	0.3231
AER	180	JV	0.0003		
CER	180	IPO	0.0203	16.26***	0.0001
CER	180	JV	-0.0090		

***, **, * indicates significance at 1%, 5% or 10% levels, respectively.

The t-test statistic shows that there is no statistically significant difference between the mean average excess return for IPOs (0.0001) and JVs (0.0003) with $t = -0.99$ and $p = 0.3231$. However, there is a significant difference between cumulative mean excess

returns for IPOs and JVs (with $t = 16.26$ and $p=0.0001$)¹⁶. In other words, IPOs have statistically significant higher cumulative mean excess returns (0.0203) than JVs (-0.009) during the first 180 days after the announcement.

3.2. Industry Concentration Analysis

A chi-square test is used to see if there is a significant relationship between two types of expansion mode, JV or IPO, and the degree of industry concentration measured by the Herfindahl index. The Herfindahl index is calculated for any industry in which joint venture is established during the period of 1993 to 2002. The chi-square contingency table to test for independence is shown in Table 5.

Table 5: Distribution of JV and IPO announcements based on three degrees of industry concentration: low, medium and high.				
	Low	Medium	High	Total
IPOs (observed)	294	363	1840	2497
Percent of total	9.12	11.26	57.09	77.47
Row percent	11.77	14.54	73.69	
Column percent	76.76	66.73	80.14	
JVs (observed)	89	181	456	726
Percent of total	2.76	5.62	14.15	22.53
Row percent	12.26	24.93	62.81	
Column percent	23.24	33.27	19.86	
Total (observed)	383	544	2296	3223
Percent	11.88	16.88	71.24	100
Chi-square test statistic = 45.45, p-value = 0.0000				

The chi-square test assumes that the expected value for each cell is five or higher. This assumption is easily met for this analysis. The JV sample in Table 5 consists of first joint venture announcements during the period of 1993 to 2002. The test result indicates that there is statistically significant relationship between the mode of expansion (IPO or JV)

¹⁶ Non-parametric Wilcoxon sign test also indicates that there is significant difference between JVs and IPOs in their CERs ($Z=12.27$, $p\text{-value}=0.0000$). Z value for AER is -1.07 with $p\text{-value}=0.2863$ (two-sided) 14.31 (one sided). The test statistic is obtained by using the npar1way procedure in SAS.

and industry concentration level (chi-square = 45.45, $p = 0.0001$). However, the findings do not support the first hypothesis that when industry concentration is high, JVs are the preferred mode of expansion. On the other hand, the results in Table 5 support the second hypothesis that when negative competitive effects are stronger than positive information effects, IPO firms choose industries with high concentration levels. In addition, the findings show that both JV and IPO firms tend to choose highly concentrated industries. While 62.81 percent of joint ventures is established in highly concentrated industries, 73.69 percent of IPOs prefer highly concentrated industries. In low concentrated industries, percentage of IPO and JV announcements is very similar, 11.77 and 12.16 percents respectively. This shows that IPO and JV firms do not prefer highly competitive industries indicating that negative competitive effects are stronger than positive information effects. The chi-square test is also applied to a sample that includes all two-parent joint venture announcements with available HI numbers for the period of 1993-2002. The results are reported in the appendix 3. However, the findings for both samples do not change the direction of the results reported in Table 5. That is, both IPO and JV firms prefer to expand into highly concentrated industries

Table 6 shows that as industry concentration increases, number of IPO and JV announcements decreases. This might seem to be contradictory to the findings reported in Table 5. However, results in Table 5 are based on Horizontal Merger Guidelines issued by the Department of Justice and Federal Trade Commission. Under these guidelines, the findings in Table 6 also indicate that IPO and JV firms prefer highly concentrated industries. Table 6 shows that majority of IPO and JV announcements take place in industries where HI is greater than 0.20, which is highly concentrated according to the

guidelines. It is shown that when industry is very highly concentrated (that is HI greater than 0.8) the number of IPOs (135) in these very highly concentrated industries is greater than the number of JVs (14). Graph that depicts the data in Table 6 is presented in appendix 3. Additionally, again for robustness check, distribution of all two-parent joint venture announcements for the same HI intervals is also presented in the appendix. The findings are very similar to the ones that are reported in Table 6.

Mode of expansion	Table 6: Distribution of IPO and first JV announcements based on different HI intervals for the period of 1993-2002.									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
JVs (n=726)	89	259	166	89	51	20	22	16	3	11
IPOs (n=2497)	292	435	384	376	345	374	119	37	26	109

4. Conclusion

The core objective of this study is to examine the effects of industry concentration on the choice of expansion modes, IPO vs. JV. The literature related to this study can be partitioned into two segments. The first segment of the literature related to this study has focused on the ownership choice between JV and wholly-owned subsidiary modes of entry. The second segment has studied the effects of IPO announcements on rival firms within the same industry. However, there has not been any study on the choice of expansion mode between JVs and IPOs under different industry concentration levels. For this, two different hypotheses are developed and tested: The first hypothesis states that when target industry is highly concentrated, the preferred mode of expansion should be JV. The second hypothesis states that when negative competitive effects are stronger than

positive information effects, IPO firms will choose highly concentrated industry. The empirical findings in this study support the second hypothesis but not the first one. This prediction suggests that an IPO announcement in a low concentration industry is going to have negative effect on rival firms. In order to avoid negative reaction by rivals in a low-concentration industry, IPO firms will expand into highly concentrated industries. When companies announce joint ventures for the first time, they also prefer highly concentrated industries. Including all two-parent joint venture announcements, regardless of their first or subsequent announcements, did not change the direction of the results. Both IPO and JV companies tend to choose industries with high concentration level. The welfare effect of both IPO and JV announcements on shareholders' wealth is also examined. For this, daily average and cumulative average excess returns based on equally weighted market index from CRSP are used. The findings show that on the day of announcement, shareholders of joint venture firms gain 2.49 percent average excess return whereas shareholders of IPO firms gain 0.20 percent average excess return on the first trading day after the announcement day. However, in the longer time period (180 days), cumulative average excess return for IPO firms (2.03 percent) is significantly higher than cumulative average excess return for JV firms (-0.9 percent).

Appendix 3

A1. Distribution of Joint Ventures and IPOs Based on SIC Codes

Table A1: The distribution of IPOs and joint ventures across industry groups using the four-digit Standard Industry Classification (SIC) code			
Industry groups	SIC	IPOs	%
Agriculture, forestry, and fishing	0100-0999	9	0.21
Mining	1000-1299	10	0.23
Oil and Gas Extraction	1300-1399	71	1.66
Nonmetallic Minerals Except Fuels	1400-1499	2	0.05
Construction	1500-1799	48	1.12
Food and Kindred Products	2000-2099	53	1.24
Tobacco Products	2100-2199	4	0.09
Textile Mill Products	2200-2299	10	0.23
Apparel and other Textile Products	2300-2399	28	0.66
Lumber and Wood Products	2400-2499	7	0.16
Furniture and Fixtures	2500-2599	14	0.33
Paper and Allied Products	2600-2699	16	0.37
Printing and Publishing	2700-2799	44	1.03
Chemicals and Allied Products	2800-2899	208	4.87
Petroleum and Coal Products	2900-2999	3	0.07
Rubber and Miscellaneous Plastics Products	3000-3099	22	0.51
Leather and Leather Products	3100-3199	7	0.16
Stone, Clay and Glass Products	3200-3299	19	0.44
Primary Metal Industries	3300-3399	37	0.87
Fabricated Metal Products	3400-3499	30	0.70
Machinery, Except Electrical	3500-3599	207	4.85
Electrical and Electronic Equipment	3600-3699	397	9.29
Transportation Equipment	3700-3799	66	1.54
Instruments and Related Products	3800-3879	211	4.94
Miscellaneous Manufacturing Industries	3900-3999	54	1.26
Cars: Transportation	4000-4799	96	2.25
Telephone and Telegraph Communication	4800-4829	160	3.75
Radio and Television Broadcasting	4830-4899	89	2.08
Utilities: Electric, Gas, and Water Supply	4900-4949	18	0.42
Garbg: Sanitary Services	4950-4959	12	0.28
Steam: Steam Supply	4960-4969	1	0.02
Water: Irrigation Systems	4970-4979	0	0.00
Wholesale	5000-5199	203	4.75
Retail: Retail Stores	5200-5999	293	6.86
Finance, Insurance, and Real Estate	6000-6999	358	8.38
Services	7000-8999	1452	33.99
Govt: Public Administration	9000-9999	10	0.23
Everything Else		3	0.07
Total		4272	100%

Table A2: Distribution of first and all two-parent joint ventures across industry groups using the four-digit Standard Industry Classification (SIC) code.

Industry type	SIC	JV ^a	%	JV ^b	%
Food and Kindred Products	2000-2099	25	2.84	555	4.17
Tobacco Products	2100-2199	5	0.57	35	0.26
Textile Mill Products	2200-2299	3	0.34	89	0.67
Apparel and other Textile Products	2300-2399	21	2.38	7	0.05
Lumber and Wood Products	2400-2499	2	0.23	31	0.23
Furniture and Fixtures	2500-2599	5	0.57	41	0.31
Paper and Allied Products	2600-2699	11	1.25	136	1.02
Printing and Publishing	2700-2799	32	3.63	441	3.32
Chemicals and Allied Products	2800-2899	147	16.69	2972	22.35
Petroleum and Coal Products	2900-2999	7	0.79	153	1.15
Rubber and Miscellaneous Plastics Products	3000-3099	9	1.02	247	1.86
Leather and Leather Products	3100-3199	3	0.34	1	0.01
Stone, Clay and Glass Products	3200-3299	7	0.79	176	1.32
Primary Metal Industries	3300-3399	28	3.18	343	2.58
Fabricated Metal Products	3400-3499	9	1.02	144	1.08
Machinery, Except Electrical	3500-3599	143	16.23	1676	12.61
Electrical and Electronic Equipment	3600-3699	235	26.67	3266	24.57
Transportation Equipment	3700-3799	29	3.29	1691	12.72
Instruments and Related Products	3800-3879	131	14.87	1094	8.23
Miscellaneous Manufacturing Industries	3900-3999	29	3.29	197	1.48
Total		881	100%	13295	100%

a: first announcements only, b: all two-parent joint venture announcements

A2. Distribution of Joint Ventures and IPOs Based on Industry Concentration

Table A3: Distribution of IPO and all two-parent JV announcements based on three degrees of industry concentration: low, medium and high.

	Low	Medium	High	Total
IPOs (observed)	294	363	1840	2497
Percent of total	1.86	2.30	11.65	15.81
Row percent	11.77	14.54	73.69	
Column percent	10.91	10.91	18.83	
JVs (observed)	2402	2963	7930	13295
Percent of total	15.21	18.76	50.22	84.19
Row percent	18.07	22.29	59.65	
Column percent	89.09	89.09	81.17	
Total (observed)	2696	3326	9770	15792
Percent	17.07	21.06	61.87	100
Chi-square test statistic = 175.70, p-value= 0.0000				

A3. Distribution of IPO and All Two-parent Joint Venture Announcements Based on Herfindahl Index Intervals for the Period of 1993-2002

	Table A4: Distribution of IPO and first and all two-parent JV announcements based on different HI intervals for the period of 1993-2002.									
	HI interval									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
JV-first N=726 (%)	89 (12.26)	259 (35.67)	166 (22.87)	89 (12.26)	51 (7.02)	20 (2.75)	22 (3.03)	16 (2.20)	3 (0.41)	11 (1.52)
JV-all N=13295 (%)	2402 (18.07)	3963 (29.81)	2978 (22.40)	1656 (12.46)	785 (5.90)	553 (4.16)	400 (3.01)	267 (2.01)	99 (0.74)	192 (1.44)
IPOs N=2497 (%)	292 (11.69)	435 (17.42)	384 (15.38)	376 (15.06)	345 (13.82)	374 (14.98)	119 (4.77)	37 (1.48)	26 (1.04)	109 (4.37)

A4. Cumulative Excess Returns

Distribution of IPO and first JV announcements based on Herfindahl index. Data are taken from Table 6.

Distribution of IPO and all JV announcements based on Herfindahl index values

**Percent distribution of IPOs and first and all two-parent
JV announcements based on Herfindahl index**

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Chapter 4: Conclusions and Prospects for Future Research

A joint venture is a way of combining resources to achieve some objective. Two or more parent companies pool their resources to accomplish that objective under the combined management of the parent companies. It is a new legal entity owned by two or more parent firms. Joint ventures are an increasingly common and important type of cooperative strategy in today's dynamic markets. The synergy hypothesis states that joint ventures are formed to create synergies resulting from sharing complementary skills and resources and stock markets should react positively to joint venture announcements. Joint ventures are also established to share risk to overcome uncertainty in demand and technology. Previous literature on joint ventures is drawn from the welfare effects of joint ventures. However, there has been a little amount of study on both risk and welfare effects of joint venture announcements on shareholder's wealth. For that reason, this dissertation is entirely dedicated to fill this existing gap in joint venture literature.

Chapter I, validity of diversification and risk-sharing motives for the creation of joint ventures are tested. The "standard event study" technique based upon the market model is used to examine the risk, diversification and return effects of two-parent joint venture announcements only. For the purpose of risk analysis, total risk is partitioned into systematic risk and unsystematic risk. In order to see if there is any difference in the risk and welfare effects of joint ventures under different joint venture structures, the initial sample is divided into different sub samples based on Standard Industry Classification (SIC) codes of parent companies and the joint ventures. The overall sample analysis indicates that the systematic risk decreases while unsystematic risk and total risk increase. The same applies to the sub-sample where two parent companies from different

industries announce a joint venture in an entirely different industry. The analysis for the sample where both parents choose not to diversify shows no significant change in all three risk measures. The results for the sub-sample where both parents within the same industry engage in a joint venture in a different industry exhibit weak evidence that the systematic risk decreases while, with strong evidence, unsystematic risk and total risk remain the same. Similarly, when a sub-sample is created where one parent is in the same industry as the joint venture, the results for the non-diversifying parent provide weak evidence that the systematic risk decreases and strong evidence that there is no change in unsystematic risk and total risk. Finally, the findings for the diversifying parents show strong evidence that unsystematic risk and total risk increase and weak evidence that the systematic risk falls. For all the samples, the estimation results suggest that there is strong evidence that the shareholders of the companies engaged in joint ventures, on average, experience highly significant positive abnormal returns – approximately between 16 percent and 44 percent - at the time of such announcements. These results show returns that are relatively much higher than those found in previous studies. However, average abnormal returns after the day of announcement are mostly negative or not significantly different from zero.

Chapter 2 aims at finding empirical evidence for the relative size hypothesis in joint venture announcements involving only two firms that differ in their sizes for the period of 1981 to 2002. Market capitalization and abnormal returns based on the market model methodologies are utilized to test for the validity of the relative size hypothesis. Each firm in the sample is categorized as “small”, “medium” or “large” firm in the joint venture based upon the market value of common equity. Then, three sub-samples that

include relatively different size firms announced joint ventures are formed. Empirical findings based on these methodologies support the relative size hypothesis predicts that market reaction to a joint venture announcement is inversely related to firm's size relative to its partner. The risk analysis of joint ventures between small and large size partners shows that systematic risk for both parents, regardless of their relative size, decreases while unsystematic and total risk levels do not change. Secondly, when the joint venture is between small and medium size parents, the medium size parents benefit from lower level of systematic risk through joint ventures whereas small parents experience no change in systematic risk. Both small and medium size parents do not observe any change in both total and unsystematic risks. Finally, when a sub-sample is formed where medium size firms partner with large firms, medium size firms do not experience any change in all three risk measures while large size firms experience increase in all three measures of the risk.

Chapter 3 studies the impact of industry concentration on the choice of expansion mode between joint ventures and IPOs. The literature related to this study can be partitioned into two groups. The first group focuses on the ownership choice between JV and wholly-owned subsidiary modes of entry. On the other hand, the second group studies the effects of IPO announcements on rival firms within the same industry. However, there has not been any study on the choice of expansion mode between joint ventures and IPOs under different degrees of industry concentration. For this, two different hypotheses are developed and tested: The first hypothesis states that when target industry is highly concentrated, the preferred mode of expansion should be joint venture. The second hypothesis states that when negative competitive effects are stronger than

positive information effects, IPO firms will choose highly concentrated industry. This study finds empirical support for the second hypothesis but not for the first one. The empirical findings show that both IPO and joint venture companies tend to choose highly concentrated industries. The welfare effect of both IPO and joint venture announcements on shareholders' wealth is also examined. The findings document that in the longer time period, cumulative average excess return for IPO firms is significantly greater than cumulative average excess return for firms that establish joint venture.

This dissertation can be extended to more than two-parent joint ventures. Further research needs to be carried out in this direction. It is also important to note that this dissertation is an empirical study of market reactions to domestic joint ventures. Similar analysis can be conducted for international joint ventures. For this, country-based analyses could also be done to test for diversification implications of international joint ventures. Economies throughout the world differ with respect to their capital markets, investment risk, and growth opportunities. Therefore, it is worthwhile to conduct further research on stock market reactions to joint venture announcements in different countries based on their efficiency of capital markets, growth opportunities and investment risk levels.