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EMPIRICAL STUDY ON THE MOTIVATIONS OF BIDDERS' SECOND TENDER OFFER CONTESTS

Wong Hong

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ABSTRACT

EMPIRICAL STUDY ON THE MOTIVATIONS OF BIDDERS' SECOND TENDER OFFERS CONTESTS

Hong Wong

This study examines the motivations behind the bidders' second tender offers for a sample of 366 bidders who made a first attempt over the period of 1976-1990. In both the short-term and the long-term, bidders do not experience a significant abnormal return. As the bidders do not earn a significant gain from their first tender offer attempts, the motivations for making another tender offer attempt are examined. A multinomial logit model is used to examine the rationales for bidders attempting a second acquisition. The results are consistent with the management entrenchment and the convergence-of-interest hypotheses. Also, a binary logit model is applied to examine the probability of the bidders becoming involved in acquisitions in the five years after their first tender offer attempts. We find that bidders with good management performance, small initial offer premium, and high dividend payouts are more likely to become involved in subsequent acquisition activity. Finally, the Cox Proportional Hazard model is estimated to incorporate the time dimension. This model examines the probability of bidders becoming involved in a subsequent acquisition activity in the two years and the five years following their first tender offers. Market variables and financial variables are highly significant in explaining the probability of bidder involvement in subsequent acquisition activity in the two-year model, whereas only financial variables are highly significant in the five-year model.

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Summary of Tables, Figures, and Appendices

1. Introduction

There are a number of studies on bidders' motivations for making acquisitions.[1] These papers combined bidders who had previous acquisition experience, and bidders who were making their first acquisition attempts. The motivations for bidder involvement in acquisition activity include synergies, economies of scale and scope, managerial incompetence, deregulation, agency problem, and managers' hubris. A study on bidders who were making their first tender offer would be a good start to examine the difference between the motivations of experienced bidders and inexperienced bidders regarding acquisitions. Hence, this paper focuses on the bidders who were making their first tender offers and studies these bidders' motivations for later participation in tender offer contests.

Previous empirical studies show that synergy gains are created by combining the target and bidder firms [Bradley, Desai, and Kim (1983, 1988), Jensen and Ruback (1983), and Healy, Palepu, and Ruback (1992)]. However, the bidder and target firms do not equally share those gains. A large body of evidence indicates that the target firms experience substantial positive abnormal returns from acquisition, while the bidders have negative or zero abnormal returns around the announcement of acquisition [Dodd and Ruback (1977), Kummer and Hoffmeister (1978), Dodd (1980), Asquith (1983), Bradley, Desai, and Kim (1983), Jensen and Ruback (1983)]. In the long run, Franks, Harris and Titman (1991) find no evidence of significant abnormal returns over a three-year period after the last bid date. Agrawal, Jaffe, and Mandelker (1992) also find that tender offers

are followed by insignificant abnormal returns over a five-year period after the effective date. If bidders earn no significant gains from their first acquisition attempts in both the short-term and the long-term, an interesting question, then, is why do these bidders make acquisition attempts again?[2]

Many studies theorize about the motivations of bidders [Bradley, Desai, and Kim (1983), Jensen (1984), Jensen (1986), Roll (1986)]. The hypothesized motivations include increasing operating efficiency, reducing agency costs, and replacing bad management. Also, managers' excessive hubris may be another motivation of bidders. While the motives for bidders in general have been studied extensively by researchers, the rationales for bidders subsequently attempting a second acquisition have received little attention. An examination of the association between these motivations and the likelihood of second acquisition attempts may help to explain the motivations for bidders attempting subsequent acquisitions.

However, it is possible that bidders will be subject to an acquisition attempt before their second acquisition attempts. The managerial synergy theory posits that a gain would be achieved by acquiring poorly managed firms and improving their performances. If the bidders have low Tobin's q, which is indicative of poor managerial performance, after their first acquisitions, they may subsequently be subject to an acquisition attempt. There are also a substantial number of empirical studies that predict takeover targets

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[1] The studies on bidders' motivation for making acquisitions include Bradley, Desai, and Kim (1983), Jensen (1984), Jensen (1986), Roll (1986).
[2] Targets here may be the same targets in the first acquisition or different targets from the first acquisition.

based on firm or industry-specific characteristics.[3] An examination of the association between these characteristics and the likelihood of bidders being subject to an acquisition attempt may help in identifying takeover targets. Finally, it is also possible for bidders to maintain the status quo when they believe their firms are already value maximizing.

Therefore, a bidder will experience one of the three mutually exclusive events after the first acquisition: (1) bidder attempts to acquire another firm, (2) bidder is subject to an acquisition attempt, or (3) bidder maintains the status quo.

The primary objective of this paper is to investigate the rationales for bidders attempting a second acquisition, facing a subsequent acquisition attempt, or maintaining the status quo by examining the characteristics of their firms and their first acquisitions. Bidders' short-term and long-term stock performance, and the probability of bidders being involved in acquisition activity in a specific length of time are also studied to provide a comprehensive picture of the rationales behind bidders' second acquisitions.

1.1 Outline of Study

First, the abnormal return on the bidders' first and second acquisition announcements will be examined. The comparison between the two announcements' abnormal returns will determine if the market reacts differently to bidders' first and second acquisition contests. The second acquisition attempts represent bidders who had prior acquisition experience. The result shows that the market reacts similarly to bidders

[3] The empirical studies include Belkaoui (1978), Dietrich and Sorenson (1984), Rege (1984), Hasbrouck

who either had acquisition experience or were making their first acquisition attempts. Both earn an insignificant abnormal return on the announcement of the acquisitions. Also, the characteristics of bidders' first acquisitions and second acquisitions are compared. The characteristics of first acquisition are not significantly different from those in the second contest. Hence, there appears to be little difference between the bidding behavior in the two contests.

In addition to evaluating the announcement effects, the abnormal return over the period from the bidder's first acquisition to a second acquisition event, either the bidder attempting to acquire another firm or the bidder being subject to an acquisition attempt, will be calculated. If there was no acquisition activity within five years of a bidder's first attempt, the abnormal return will be calculated over the period from the first attempt to the fifth year[4]. The reason for calculating the abnormal return over the five year period after the first attempt is to find the association between the bidder's market performance and the three mutually exclusive events. Jensen (1988) finds that bidders tend to earn significantly positive abnormal return prior to acquisitions. However, our results show that the bidders do not have significant five-year abnormal returns prior to any of the three mutually exclusive events.

(1985), Palepu (1986), Barnes (1990) and Mcguinness (1993).

[4] Agrawal, Jaffe, and Mandelker (1992) and Loughran and Vijh (1997) evaluate five-year performance following the acquisition. The five-year period is sufficiently long to evaluate the impact of the acquisition on the bidders. Also, the CRSP data-availability is up to 1995 and the sample period in this study is from 1976 to 1990. Therefore, only five-year stock returns can be obtained for the bidder who made the first acquisition in 1990.

Second, an examination of the rationales for bidders attempting a second acquisition, being subject to an acquisition attempt, or maintaining the status quo within five years of their first attempts is the main objective of this study. This will be done by estimating the relationship between the likelihood of these three events and the characteristics of bidders' firms and their first acquisitions. Consistent with the entrenchment hypothesis, management ownership in the range of 5%-25% is found to reduce the probability of bidders attempting a second acquisition and to increase the probability of bidders being subject to an acquisition attempt. In contrast, management ownership above 25% is found to increase the probability of bidders attempting a second acquisition and to decrease the probability of bidders being subject to an acquisition attempt. These findings support the convergence-of-interest hypothesis.

The underlying assumption of the multinomial logit model is tested. We find that the assumption is violated in this data and that the multinomial logit model is inappropriately applied here. However, the findings obtained from the multinomial logit model provide two directions for future research. They suggest repeating this study using the multinomial probit model and also including other variables, such as management compensation plans, in future studies.

The binary logit model for explaining the probability of bidders being involved in acquisition activity within five years after the first acquisition is examined. Bidders being involved in acquisition activity combines bidders attempting another acquisition and bidders being subject to an acquisition attempt. Bidders with good management

performance, small offer premium at first tender offer, and large dividend payout are more likely to become involved in acquisition activity in the five years following the first acquisition.

In addition to logit models, which provide estimates of the probability of an event's occurrence, the Cox Proportional Hazard model is also estimated to incorporate the time dimension. The Cox Proportional Hazard model is used to estimate the probability distribution of event time, where the event is bidders being involved in acquisition activity within a fixed period (two years and five years) after the first acquisition. Market variables and financial variables are good predictors in two years and only financial variables are good predictors in the five-year model.

The remainder of the paper is organized as follows: In section II, the hypothesized motivations are reviewed. In section III, the sample and description of data are discussed. In section IV, the methodology is described. Section V presents and analyzes the empirical results. In section VI, a summary and conclusions are given.

2. The Hypothesized Motivations

The goal of this study is to provide a descriptive analysis of the relationship between the three events, and the characteristics of bidders' firms and their first tender offer contests. Variables are selected on the basis of eight hypothesized motivations which are frequently suggested in the financial literature. The hypothesized motivations and variables to represent each hypothesized motivation are discussed below.

Operational Efficiency

Differential efficiency suggests that a gain can be realized by acquiring firms with below average efficiency or which are not operating up to maximum potential. The gain is obtained from acquiring valuable resources of an inefficient firm at a lower cost and improving its performance. Therefore, a firm with an inefficient operating performance is likely to be an attractive takeover target. Two measures of operating performance are used here. First, the return on assets is used to measure the firm's profitability and is calculated by earnings before interest and taxes (EBIT) divided by total assets. Second, the asset turnover is measured by the current assets to total assets ratio.

Management Performance

Jensen (1988) discusses the theory of a market for corporate control where managers compete for the right to the control of corporate resources. The winners are the managers best able to maximize corporate market value. The firms of these managers should have good performance. Jensen also points out that many acquirers tend to have significant positive gains prior to acquisition. The annualized buy-and-hold excess return on the firm's stock, averaged over the period from the day after the first tender offer ending date to five days before the second tender offer announcement, is used as a proxy for management performance in this study.[5] The excess return reflects both the current performance and the market expectation of future performance of the firm.

[5] See the Section "Long-term Performance of Methodology" for details on the calculation of buy-and-hold excess return.

Inefficient management is observed when the incumbent management team fails to maximize the corporate market value. The acquisition is the most efficient way of replacing these inefficient managers, thereby redeploying corporate resources to higher-value usage. A firm with a poor management team is more likely to be a takeover target.[6] An accounting profitability ratio, Return on Equity, is used as a proxy for management performance. An accounting efficiency ratio, Net Sales/Total Assets, is used as a proxy for management efficiency in producing sales per dollar of assets.

Free Cash Flow

The free cash flow theory assumes that managers may waste excess cash flow through organizational inefficiencies or invest them to yield subnormal returns. Jensen (1986) proposes that takeovers are the resolution of agency problems caused by managers' control over free cash flow. Therefore, the more free cash flow the bidder has, the higher the probability that the bidder will make an acquisition.

An alternative way to lower the agency costs is to pay out free cash flows to shareholders. A high dividend payout ratio indicates that corporate resources are leaving management's control. If the managers are a manifestation of the agency problem, bidders with a high dividend payout may reduce the payout in order to invest in acquisitions that allow managers to retain control of corporate resources. If a firm does not have investment opportunities and does not distribute excess free cash flow to

[6] Being taken over is not necessary for poor management firm. It is also a good strategy for firm to maximize its firm's value.

shareholders, it would become an easy target for a takeover. Simkowitz and Monroe (1971) find that the target firms have a lower dividend payout.

Another measure of free cash flow is the amount of the first acquisition premium. If the firm paid a substantial dollar premium on the first acquisition in relative to its size, it is unlikely that it will carry out another acquisition due to a lack of sufficient cash flow. In this study, we use the offer premium as the proxy for total dollar premium relative to firm size.[7] Offer premium is defined as offer price relative to the price 60 days prior to the first tender offer.

Capital Structure

Acquisitions are effective ways to adjust a firm's capital structure. A high level of equity in a firm's capital structure makes it difficult to obtain additional external capital at a low cost. Therefore, a firm can replace equity with debt by financing the takeover with borrowed money, thereby lowering the cost of capital. Jensen (1988) discusses the incentive effects of debt, whereby increased debt reduces agency costs. Another incentive for increasing the level of leverage is the tax savings on debt. Hence, firms with unused debt capacity may be able to create value by acquiring highly leveraged firms with a lot of investment opportunities. It is an efficient way to transfer idle capital from firms without investment opportunities to firms with many investment opportunities. The leverage ratio is measured as total liabilities divided by total assets.

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[7] The proxy, offer premium, is used because the total dollar premium offered is not available for most bidders in the sample. The offer premium may be a weak proxy due to the relative size of the bidders and target. For example, compare the case where the bidder is 100000x larger than the target and offers a 200% premium, versus the case where the bidder is the same size as the target and also offers a 200% premium.

Insider Ownership

Agency theory proposes that managers pursue value-reducing strategies to further their own interests at the expense of shareholders. Mueller (1969), Jensen and Meckling (1976), Jensen (1986), and Shleifer and Vishny (1989) explain that the cause of the agency problem is due to the small fraction of shares of the firm owned by managers. Partial ownership may cause the managers to work less vigorously and take more perquisites, and also pursue non-value-maximizing objectives such as sales growth and corporate diversification, because the majority owners bear most of the cost.

The convergence-of-interests hypothesis proposes that the market value of a firm increases with the rise of management ownership. As the management ownership increases, managers may be less likely to squander corporate wealth because they also bear a larger share of these costs.

However, if managers control a fraction of a firm's equity which has enough voting power to guarantee their employment with the firm at attractive salaries, they may indulge their preferences for non-value maximizing behavior, such as rejecting takeover offers from other firms. The entrenchment hypothesis predicts that the firm may entail a penalty in terms of the market valuation when managed by an individual free from checks on his or her behavior. Morck, Shleifer and Vishny (1988) find that a negative relationship exists between the management ownership in the range of 5%-25% and the market valuation of the firm's assets. The value of the firm declines when the managers are not acting to maximize the firm's value. Such a non-maximizing firm, then, is likely

to be a target because of the potential gains associated with purchasing poorly managed firms, removing the inefficient management, and improving their performance. Insider ownership of the firm is used to measure the level of the management stake in the control of the firm and is obtained from the appropriate Value Line issue immediately before the first tender offer announcement date.

Firm Size

The role of large firm size is to induce barriers to takeovers. It is because there are several size-related 'transaction costs' associated with acquiring a firm, such as the cost of fighting a prolonged battle that a target may wage to defend itself. These costs are likely to increase with the firm's size. Therefore, large firms are less likely to be acquired than small ones.

Hubris Hypothesis

Roll (1986) suggests that corporate takeovers can be explained by the hubris hypothesis. This hypothesis suggests that managers make acquisitions due to their excessive pride, animal spirits, or hubris. They are convinced that their valuation of a target is correct. Therefore, the takeover phenomenon is a result of the managers' overbearing presumption that their valuation is right. When the target management reaction to the first acquisition is friendly, it implies that the bidder's managers have made either a fair or an excessive bid for the target. When the bidder's managers believe that they have made a fair bid or made a correct valuation of the target of their first acquisition attempts, it is expected that the bidder's managers may make another

acquisition attempt due to their hubris. Target management reaction to the offer is classified as friendly or supportive if the management announces that the offer is fair or equitable. The management reaction is classified as hostile or unsupportive when the target management announces that the offer is unfair, fraudulent, or inadequate. If no reaction is announced, it is treated as a friendly reaction.

Another proxy for testing the hubris hypothesis is the result of the first acquisition. Walking (1985) finds that the success of the tender offer is positively related to level of support by target management. If the first acquisition was successful, it implies that bidders' managers received a supportive reception from a target due to either a fair or an excessive bid offering. Therefore, the hubris hypothesis suggests that bidders' managers may make another acquisition attempt because of their success in the first acquisition. The bidder was classified as successful if its holding of the target increased by 5 percentage points. The increase in holdings of 5% was selected to ensure that the change in ownership was substantial and to lessen the risk of relatively small errors in reported levels of stock ownership resulting in misclassification of outcomes.[8]

Antitrust Policy

Corporate takeovers were very active in the 1980s. There were numerous factors behind the high level of takeover activities in the 1980s. One of the main factors is the deregulation of antitrust policy. For example, the vertical combinations and horizontal

[8] See S. Betton, "An Empirical Analysis of the Market for Corporate Control: Tender Offers from 1971-1990". Working paper, p.15-16 for more detail.

mergers between industry leaders that were completely taboo before the 1980s are often allowed in 1980s.

The United States Department of Justice Merger Guidelines, issued June 14, 1982, may help to explain the increased acquisition activities in the 1980s. Fox (1982) finds that only 10% of the 20 leading court cases in the past were likely to be challenged under the new 1982 merger guidelines. Table 1 reports the percentage of tender offers challenged by antitrust and others (such as state regulation, target and bidder shareholders). It shows that the percentage of tender offers challenged by antitrust decreased from 14.36% before June14, 1982 to 4.93% after June 14, 1982.

The United States Justice Department and the Federal Trade Commission (FTC) have traditionally looked at the market concentration in a particular industry to determine the possible anticompetitive effects of merger and acquisition. If it were found that one or several market participants might have an undesirable or too high a level of concentration due to the occurrence of a merger or acquisition, the government authorities would typically step in and challenge the merger.

After June 14, 1982, the Herfindahl Index became the preferred method to verify if an undesirable level of industry concentration existed. This index is calculated as the sum of the squares of the percent market shares of the market participants. The Herfindahl Index is supposedly sensitive not only to the degree of concentration in the market, but also to the level of inequality in the market. Therefore, if the results of merger

and acquisition were the creation of a high market share for the combined firm, then, due to the nature of the Herfindahl index, the index value would rise considerably. If this increase in the index were deemed unacceptable by the government authorities, then, the merger or acquisition would be challenged.

Although a new measure of concentration, the HHI, was adopted, the guidelines also encompass many additional dimensions of the behavior and performance of economic markets. The guidelines state that the concentration numbers, HHI, can be adjusted by other factors that influence whether firms may be able to increase price and restrict output. For example, a high HHI may be offset by high market price elasticity of demand or high market price elasticity of supply. The decreased likelihood of challenge due to the flexibility of the measurement of HHI and the more relaxed attitude of the regulators [see Fox (1982)] is expected to increase the level of mergers and acquisitions in the 1980's. Hence, we may expect that P(BIDDER) and P(TARGET) will increase.

The eight motivations and the variables they imply are summarized in Table 2. The hypothesized sign of each variable shows the probability of bidders attempting a second tender offer, P(BIDDER), and the probability of bidders subsequently being attempted, P(TARGET). A brief description and summary statistics of these variables are presented in Tables 3 and 4, respectively.

3. Sample

To identify the sample of acquisitions, the tender offers filings for the period from January 1971 to December 1990 are derived from the Austin database, the Simon database, and the Mergerstat Review.[9] The bidders who filed the tender offer in the period of 1971-1990 are divided into non-CRSP firms and CRSP firms. Non-CRSP bidders are private firms, foreign firms, individuals, and groups of investors that are not listed in the CRSP. There are 528 non-CRSP bidders, and Table 5 shows that there are only 11 cases of these bidders attempting a second acquisition and only one case for bidders being subject to an acquisition attempt. The reason for excluding the non-CRSP bidders from this study is that their long-term abnormal returns cannot be estimated, because they do not have stock return data available in the CRSP database.

CRSP bidders are public firms that are listed in the CRSP databases. For convenience, CRSP bidders are hereafter referred to as bidders in this paper. Table 6 shows the distribution of active bidders making tender offers in the period of 1971-1990. There are a total of 1025 active bidders in this period.[10] Regulated firms (such as communication, finance, and transportation) are eliminated because these firms face the high degree of government regulation and information disclosure that may have a significant impact on takeovers.[11] Bidders without SIC codes are also eliminated.[12] Altogether, 683 bidders met this first set of criteria.

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[9] The tender offer sample is kindly provided by Professor Sandra Betton of Concordia University.

[10] The purpose of this table is to summarize the number of active bidders in each year. If a bidder made two acquisitions in a year, one active bidder is considered in that year. If a bidder made two acquisitions, one in 1978, and another in 1980, one active bidder is counted in 1978 and one active bidder is counted in 1980. The bidders making LBO, MBO and self-acquisitions are excluded.

[11] For example, in January 1988, BAT PLC made an offer for Farmers Group, an insurance company. As

To ensure that the first acquisition is in fact the first, the activity of the bidder during the preceding 5 years was examined. If the bidder was involved in a tender offer, either as a bidder or as a target, the current acquisition was deleted from the sample, as it was not the first event during the period of 1976-1990.[13] This procedure resulted in 314 bidders being deleted from the sample. There are three special cases in which the bidder made the first and second tender offers on the same date. These confounding special cases are excluded from the sample. Altogether, 366 bidders met this second set of criteria. The sample selection procedure is summarized in Table 7. The final sample distributed by year and industry, and by the three mutually exclusive events is summarized in Tables 8 and 9, respectively.

In addition to bidders, targets are also examined. Table 10 shows the distribution of active targets in the period of 1971-1990. The sample selection criteria used by bidders are applied to targets. Table 10 summarizes the procedures to select a target sample. Table 11 shows the final target sample distributed by year and industry. Table 12 shows the final target sample distributed by three mutually exclusive events. There are only 6 targets attempting an acquisition and only 5 targets being subject to a second acquisition attempt. Since targets do not have many acquisition activities after the first acquisition attempt, they will not be included in this study.

Farmers operated in many states, the takeover by a foreign firm had to be approved by various state insurance commissioners. In November 1988, five of the nine insurance commissions involved had approved the acquisition. BAT successfully acquired Farmers Group in December 1988.

[12] The reason for eliminating bidders without SIC codes is that these bidders cannot be matched with universe matching sample.

[13] The reason for starting the sample selection period in 1976 is that it ensures the bidders did not have any acquisition prior to their offers in the period of 1976-1990 at least for five years. For bidders who had the tender offers in 1976-1990, the activity of the bidders during 1971-1995 was examined. Three hundred and fourteen bidders were involved in tender offer activities during the five years preceding their tender offers

4. Methodology

The market model, which is commonly used to estimate the stock price performance around the acquisition announcement, is reviewed first. The use of five-year buy-and-hold abnormal return, which is adjusted by size and book-to-market effect for evaluating bidders' long-term performance, is discussed next. The market-adjusted model is also presented to show the misspecification of estimating abnormal return induced by failing to use the correct model. Then, the multinomial logit model, IIA assumption, and the test of IIA assumption are presented. The Cox Proportional Hazard Model and the assumption of the model are described finally.

4.1 Abnormal returns

4.1.1 Short-term performance

To examine the impact of the acquisition announcement on the bidders in the first and second tender offers, abnormal return analysis on the shares of the bidders will be performed. In event time, day 0 is the announcement date. The event period runs from -5 to +5. Data from the event dates (first and second acquisition announcement dates), -170 to -20, are used to estimate the parameters of the market model:[14,15]

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made in the period of 1976-1990.

[14] The length of the estimation period is selected for obtaining reliable estimates for the market model. It usually takes 4 to 6 months for evaluating short-term performance. Doukas and Travlos (1988) use a 4-month estimation period while Mitchell and Lehn (1990) use an almost 5-month estimation period. Markides and Ittner (1994) use 6 months. The period over which the beta estimates are to be calculated (estimation period) must have relevance to the period over which the beta estimates are to be applied (event period). The estimates obtained from the estimation period which have different market and company-specific circumstances from that in the event period may incorrectly reflect the price and return in event period. Therefore, the recent of data is used. Hence, return data for day -170 through -20 from the event date (day 0) is selected for the estimation period in this study.

$$R_{jt} = \alpha_j + \beta_j Rm_{jt} + \varepsilon_{jt}, \qquad t = -170,\ldots,-20, \tag{1}$$

where

R_{jt} = daily stock return for bidder j in day t,

Rm_t = return on the equally weighted market portfolio in day t

α_j, β_j = regression parameters, and

ε_j = error term, assumed to be normally distributed with mean zero and constant variance σ_j^2.

The abnormal return to bidder j in day t is defined as:

$$AR_{jt} = R_{jt} - \hat{\alpha}_j - \hat{\beta}_j Rm_t, \qquad t = -5,\ldots,+5, \tag{2}$$

where $\hat{\alpha}_j, \hat{\beta}_j$ are the estimates of α_j, β_j of market model. The average abnormal return (AAR) to the bidders is:

$$AAR_t = \left(\frac{1}{N}\right)\sum_{j=1}^{N} AR_{jt}, \tag{3}$$

where N is the number of bidders with abnormal return in day t. The average standardized abnormal return (ASAR) for bidders is:

$$ASAR_t = \left(\frac{1}{N}\right)\sum_{j=1}^{N}\left(\frac{AR_{jt}}{\sigma_{jt}}\right), \tag{4}$$

where σ_{jt} is the square root of bidder j's estimated forecast variance in day t

$$\sigma_{jt} = \left\{\sigma_j^2\left\{1 + \frac{1}{L} + \frac{\left(R_{mt} - \bar{R}_m\right)^2}{\sum_{k=1}^{L}\left(R_{mk} - \bar{R}_m\right)^2}\right\}\right\}^{\frac{1}{2}}, \tag{5}$$

[15] Fourteen bidders' second tender offers occurred less than 170 days after the ending date of the first tender offer. These second tender offers would not be included in the abnormal return analysis.

where σ_j^2 is the residual variance for bidder j from the market model regression, L is the number of observations during the estimation period. R_{mk} is the return on the market portfolio for the Kth day of the estimation period, R_{mt} is the return on the market portfolio for day t, and $\bar{R}_m$ is the average return of the market portfolio for the estimation period. Assuming that the individual abnormal returns are normally distributed and independent across bidders, the Z-statistics are used to test the hypothesis that the average standardized abnormal return equals zero, where

$$Z_t = \sqrt{N}\ \mathrm{ASAR}_t\,, \tag{6}$$

The Z-statistics for cumulative average abnormal return (CAAR) to the bidder firms from time 1 (T1) to time 2 (T2) are given by:

$$Z_{T1.T2} = \frac{\sqrt{N}}{\sqrt{T1 - T2 + 1}} \sum_{T1}^{T2} ASAR_t \tag{7}$$

and

$$\mathrm{CAAR}_t = \sum_{t=T1}^{T2} AAR_t \tag{8}$$

4.1.2 Long-term performance

The model selected to evaluate the five-year abnormal return is important. Fama and French (1993) find that failure to use the correct model could result in systematic biases and misspecification.

The models commonly used by many researchers to evaluate the long-term impact of the acquisition on the firm value are the market model, the market-adjusted model, and

the capital asset pricing model [Schipper and Thompson (1983), Agarwal, Jaffe, Mandeker (1992), Loderer and Martin (1992), and Clark and Ofek (1994)].[16] Kothari and Warner (1997) find that these models are severely positively misspecified, particularly when returns are aggregated over long horizons (e.g., three years). Fama and French (1992), Barber and Lyon (1997), and Kothari and Warner (1997) also find that when the abnormal returns are calculated using the benchmark of a control firm with similar size and book-to-market characteristics, a well-specified performance measure is yielded. They also argue that the buy-and-hold return should be used to calculate the abnormal return, because summing the daily or monthly abnormal returns bias the estimation of abnormal returns.[17] The sample firm buy-and-hold abnormal return, then, should be calculated as a simple buy-and-hold return on a sample firm less the simple buy-and-hold return on a control firm with similar size and book-to-market. The buy-and-hold return of bidder j for the n-year holding period is

$$\mathrm{HPR_j} = \left[\prod_{t=1}^{n}\left(1+r_{jt}\right)\right]-1, \tag{9}$$

where r_{jt} is the return on month t from the CRSP monthly returns file for bidder j. To test the null hypothesis that the mean buy-and-hold abnormal returns are equal to zero for the sample of k bidders, the parametric test statistic is:

$$t_{\mathrm{HPAR}} = \overline{HPAR_{jd}} \,/\left(\sigma\left(HPAR_{jd}\right)/\sqrt{k}\right), \tag{10}$$

[16] There are also some studies examine the long-term acquisition performance by using the benchmark of cash flow. This performance measure is used to measure the operating performance. However, in this study, the purpose of the estimation of long-term performance is to examine how the stock performance related to the three mutually exclusive events. Therefore, the stock performance is used.

[17] Roll (1983), Blume and Stambaugh (1983), and Conrad and Kaul (1993) find that the bias is caused by the bid-ask effect in the closing prices and can be non-trivial for daily returns on stocks.

where $\overline{HPAR_{jd}}$ is the sample average and $\sigma(HPAR_{jd})$ is the cross-sectional sample standard deviations of the buy-and-hold abnormal returns for the sample of k bidders.

All operating firms (excluding regulated firms, such as finance, utility, railway and communication) listed on the CRSP tape for at least five years are divided into seven industries based on the first 2-digit SIC code. The industry names and corresponding SIC codes are summarized in the following:

Industry	SIC Code Range
Agriculture	01 - 09
Mining	10 - 14
Construction	15 - 17
Manufacturin	20 - 39
Wholesale	50 - 51
Retail	52 - 59
Services	70 - 89

In order to obtain industry-adjusted regression coefficients that explain long-term returns, firms (excluding sample firms) within the same industry group are used to estimate the regression of one-year buy-and-hold returns on the natural logarithm of size and the natural logarithm of book-to-market at each year.[18,19] Size is the market value of

[18] Usually, the small firms are more likely to have high book-to-market ratios, and the large firms tend to have low book-to-market ratios. The regression of one-year buy-and-hold returns on the natural logarithm of both size and book-to-market ratio incorporates the interaction of both size and book-to-market ratio in this bivariate regression. Fama and French (1992) find that the average slopes in this bivariate regression are needed to explain the cross-section of average returns. Since there is some interaction between size and book-to-market, matching with size only may not fully reflect the average returns.

[19] The reason of excluding sample firms into the industry-adjusted regression is to exclude any sample firms' specific characteristics from the regression. The matching firms chosen from the regression would not incorporate any characteristics of sample firms, and the matching is more reliable. The industry-adjusted regression including sample firms is also examined and there is no significant difference including or excluding the sample firms in the industry-adjusted regression.

equity, and book-to-market ratio is the book value of equity divided by market value of equity. The yearly required return on equity (F-value) is [20]

$$F = b_0 + b_1 * \ln(\text{size}) + b_2 * \ln(\text{book-to-market ratio})$$

There are 7 regressions each year and a total of 105 regressions from 1976-1990. The size and book-to-market coefficients from yearly industry-adjusted regressions will be used to form a function that ranks all firms within the same industry group according to their yearly required returns on equity.

Each year, from 1976 to 1990, all firms within the same industry group are ranked according to their F-values. Within an industry group, a bidder will then be paired with a matching firm with the closest F-value.[21,22] Bidders with missing book values are paired with the matching firms solely on the basis of size (market value of equity). There are 150 bidders missing Compustat book values. Moody's Industrial Manuals, then, are used to find the book values for such bidders. Finally, 80 bidders were found. We were left with 70 bidders without book values. These 70 bidders are then paired with the matching firms by size only.[23]

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[20] The betas are not included in the regression, as Fama and French (1992) show that they have no explanatory power in the cross-section of expected stock returns.
[21] To test the validity of matching, F-value and Size of matching firms are compared to that of sample firms. Over 93% of cases the matching firms' F-value and Size are within 10% of those of sample firms.
[22] The reason of using single matching firm to pair with bidders instead of using matching portfolio is the use of matching portfolio to calculate buy-and-hold abnormal return is subject to the new listing, rebalancing, and skewness biases. Therefore, the single matching firm approach eliminates these biases.
[23] See Loughran T., and A. M. Vijh (1997). "Do Long-Term Shareholders Benefit from Corporate Acquisitions?", forthcoming in Journal of Finance, p.9.

The abnormal return is the difference between holding period returns of the sample firm and the matching firm. The study period is the five years after the first acquisition ending date. The buy-and-hold returns are calculated for the bidders and matching firms over an identical time interval, starting on the day after the first acquisition ending date. If the bidder has the second attempt prior to the end of the five-year study period, the time interval for calculating the buy-and-hold returns ends at that date. The same procedure applies to a bidder being subject to an acquisition attempt prior to the end of the study period. If the bidder has no acquisition activity prior to the end of this period, the five-year buy-and-hold returns will be calculated for both the bidder and matching firm. To minimize the effect of survival bias, if a bidder does not survive five years, a buy-and-hold abnormal return is estimated for as long as data are available. If a matching firm does not survive five years, the next firm with the closest F-value or size is chosen as the additional matching firm. Returns for the additional matching firms are spliced in from that date forward.[24] Only 11 percent of sample firms needed a second matching firm.

The market-adjusted model is examined to show the misspecification in estimating five-year buy-and-hold abnormal return. The market-adjusted buy-and-hold abnormal return for the bidder j in month t is

$$MAHPR_{jt} = HPR_{jt} - HPR_{mt}, \qquad (11)$$

where HPR_{jt} is the buy-and-hold return for the bidder j in month t and HPR_{mt} is the buy-and-hold market return in month t. The test statistic of buy-and-hold abnormal return is calculated by using Equation 10.

[24] Loughran and Vijh (1997), p.10.

4.2 Logit Model

In order to predict how likely the event is to occur, a probability model should be applied. There are a number of probability models available for analyzing event probability, such as binary, sequential, ordinal, and multinomial logit and probit. The binary logit and probit models are used only in two category response (dependent) variables—event A or non-A. The sequential logit and probit models, also called sequential-response or hierarchical-response, are used when the dependent variables are perceived as a sequence of events. The dependent variables in a later stage are nested in the dependent variables in an earlier stage. The ordinal logit and probit models are used only in the ordered dependent variables, such as "poor, good, excellent". The multinomial logit and probit models are used when the dependent variables are truly discrete and unordered. In this study, dependent variables of three mutually exclusive events—bidder attempting a second acquisition, being subject to an acquisition attempt or maintaining the status quo—are discrete and unordered. A multinomial logit or probit model, therefore, should be employed.

The estimation of a probit model is difficult because of the complexity of the choice probabilities. To evaluate a log likelihood function using these choice probabilities, numerous integrations are required; to find the value of the parameters that maximizes the function, these numerous integrals must be evaluated numerous times. Therefore, it is rarely used. A multinomial logit model will be used in this study.

4.2.1 Multinomial Logit Model

A multinomial logit model is the natural extension of the binary logit model. Therefore, the binary logit model will be reviewed first. The binary logit model is applied only when there are two categories in the response (dependent) variables. The binary logit model may be expressed in terms of logit, or it may be expressed in terms of the event probability. When expressed in logit form, the model is specified as

$$Ln\left[\frac{P(y=1)}{1-P(y=1)}\right]=\sum_{k=1}^{K}\beta_k X_k. \tag{12}$$

where β is the estimated parameter and K is the number of variables. The model expressed in probability form is

$$\mathrm{P(y=1)}=\frac{\exp\left(\sum_{k=1}^{K}\beta_k X_k\right)}{1+\exp\left(\sum_{k=1}^{K}\beta_k X_k\right)}. \tag{13}$$

P(y=1) represents the probability of an event occurring. For P(y=0), probability of non-event, it is just 1 minus the event probability or

$$\mathrm{P(y=0)}=\frac{1}{1+\exp\left(\sum_{k=1}^{K}\beta_k X_k\right)}. \tag{14}$$

Unlike the binary logit model, the multinomial logit model estimates the effects of explanatory variables on polytomous dependent variables which are unordered and discrete. The equation,

$$P(y=j) = \frac{\exp\left(\sum_{k=1}^{K} \beta_{jk} X_k\right)}{1 + \sum_{j=1}^{J-1} \exp\left(\sum_{k=1}^{K} \beta_{jk} X_k\right)}, \qquad (15)$$

gives P(y=j) where j=1,2,...,J-1. The parameters ß have two subscripts in the model, k for distinguishing X variables, j for distinguishing response categories, and J for indicating the numbers of response categories. The subscript j indicates that now there are J-1 sets of ß estimates. In other words, the total number of parameter estimates will be (J-1)K. This implies that the sample size should be larger than (J-1)K. For 10 (explanatory) variables including the intercept and three response categories in the dependent variables, the total number of parameter estimates will be 20. Most often, the response category, which is of the least interest in the study, is used as a reference category against which other response categories are compared. The parameter estimates therefore reflect the ratio of probability of the response category to probability of the reference category.

The equation of P(y=J) is

$$P(y=J) = \frac{1}{1 + \sum_{j=1}^{J-1} \exp\left(\sum_{k=1}^{K} \beta_{jk} X_k\right)}, \qquad (16)$$

Alternatively, the last probability can also be derived by taking 1-[P(y=1)+...+P(y=J-1)].

If J=2, Equation (15) simplifies to Equation (13) for binary logit models. The similarities between multinomial logit models and binary logit models can also be seen from Equations (15) and (16). Both equations imply the following:

$$\ln\left[\frac{P(y=j)}{P(y=J)}\right] = \sum_{k=1}^{K} \beta_{jk} X_k \,. \tag{17}$$

When J=2, Equation (17) simplifies to Equation (12), the binary logit model.

The similarities in formulation between the binary logit and the multinomial logit models suggest several things. First, probability in a multinomial logit model can be calculated similarly to that in a binary logit model, with the only modification being accounting for multiple sets of ß estimates. In addition, the comparison in the binary logit is between category 1 and category 2, or the first versus the last category. The comparison in the multinomial logit is between categories j and J.

A multinomial logit estimation procedure is used here to determine the association between the likelihood of three mutually exclusive events—bidders attempting a second acquisition, being subject to an acquisition attempt, or maintaining the status quo—and the characteristics of bidders' first acquisition attempts. The study period will be the five years after the bidders' first acquisition attempts. In terms of the likelihood of bidders attempting a second acquisition or being subject to an acquisition attempt, the following relationships are obtained from Equation (17):

$$\frac{P(BIDDER)}{P(NA)} = \exp\left(\sum_{k=1}^{K} \beta_{Bid,k} X_k\right), \tag{18}$$

$$\frac{P(TARGET)}{P(NA)} = \exp\left(\sum_{k=1}^{K} \beta_{Tgt,k} X_k\right), \tag{19}$$

where P(BIDDER) and P(TARGET) denote the probability of bidders attempting a second acquisition and bidders being subject to an acquisition attempts, respectively;

P(NA) is the probability that the bidder maintains the status quo; X_k are explanatory variables; and $ß_{Bid}$ and $ß_{Tgt}$ represent coefficients which are allowed to differ in explaining the probability of bidders attempting a second acquisition or being subject to an acquisition attempt. In a multinomial logit model, the dependent variable, bidders maintaining the status quo, is used as the reference state, because this state is of the least interest in this study.

This multinomial logit estimation procedure will be carried out by using statistical software called SHAZAM. The parameter $ß$ is estimated by maximum-likelihood methods. The maximum-likelihood method estimates the parameters of the linear model so as to maximize the value of the joint multinomial likelihood function of the responses. For N bidders, the likelihood function is

$$L(\beta) = \prod_{n=1}^{N} \prod_{j=1}^{J} P_{jn}^{y_{jn}}, \tag{20}$$

where P_{jn} is the probability of nth bidder choosing jth event (i.e. BIDDER, TARGET, NA), $y_{jn} = 1$ if the nth bidder falls in the jth events, otherwise zero. J is total number events. The likelihood function is maximized by maximizing the log of the likelihood function. The log likelihood function, designated LL, is written as

$$LL(\beta) = \sum_{n=1}^{N} \sum_{j=1}^{J} y_{jn} \log P_{jn}, \tag{21}$$

When y_{jn} is one, $LL(\beta)$ is simply the log of the probability of the chosen event of each bidder, summed over all sampled bidders. The estimate of β is that which maximizes this sum.

It is often useful to know the extent to which the probabilities of events change in response to a change in an independent variable in the model. For example, to what extent will P(BIDDER) increase if the managerial performance is improved? To address this issue, we need the derivative of P(BIDDER) with respect to the managerial performance variable. The change in P(BIDDER) for *n*th bidder given a change in the managerial performance variable, X_1 , is

$$\partial P_{Bid} / \partial X_1 = P_{Bid} \left(\beta_{1,Bid} - \sum_{j=1}^{J-1} P_j \left(\beta_{1,j} \right) \right), \tag{22}$$

where P_{Bid} is the probability of bidders making a second acquisition attempt, P_j is the probability of bidders choosing the *j*th event, and $\beta_{1,j}$ and $\beta_{1,Bid}$ are the estimated coefficient of managerial performance for bidders who chose the *j*th event and for bidders who attempted a second tender offer, respectively. However, economists often measure elasticity of probability of response rather than derivative, since elasticity is normalized for the variables' units. Elasticity is the percent change in one variable that is associated with a percent change in another variable. The elasticity of P_j for *n*th bidder with respect to X_k, a variable entering the utility of event *j*, is

$$\varepsilon = (\partial P_j / \partial X_k) (X_k / P_j). \tag{23}$$

4.2.2 IIA Assumption

One important issue in the use of multinomial logit models is the assumption of independence from irrelevant alternatives, or IIA. The IIA property holds that the ratio of the choice probabilities of any two alternatives (in response categories) for a particular observation is not influenced systematically by any other alternatives and characteristics

of other alternatives. A frequently cited example is the red bus/blue bus problem. The traveler has two choices of modes of transportation—car or bus. The choice probability for each mode is 0.5 and the ratio of the two choice probabilities is 0.5/0.5 = 1. Suppose that another bus service is introduced that is equal in all attributes but different in color. Buses in one service are painted red and those in the other, blue. If the ratio of choice probabilities is to be constant, every choice probability should equal 1/3. But this scenario is unrealistic because travelers are most likely to treat the two bus services as the same. That is, the choice probability for car is still 0.5 and the probability for either red or blue bus is 0.25. Now the ratio of the probability for car and the probability for a red bus service is 0.5/0.25 = 2/1; thus, the assumption of IIA is violated because some of the choices are not independent from each other.[25]

Consider an example in the context of this paper. Bidder A may choose to make another attempt to achieve a certain amount of synergy or maintain the status quo. Under certain financial circumstances, the probability of Bidder A attempting another acquisition, P(BIDDER), is 0.6 and the probability of Bidder A doing nothing, P(NA), is 0.4. The ratio of P(NA) and P(BIDDER) is 2/3. Suppose now that we allow for the possibility of Bidder A becoming a target. The probability of Bidder A being a target, P(TARGET), is 0.25. If the IIA assumption is to hold, the ratio of P(NA) and P(Bidder) should still be 2:3. Then, P(NA) would be 0.30 and P(BIDDER) would be 0.45, and the ratio of P(NA) and P(BIDDER) is 0.30/0.45 = 2/3. Based on the assumption of IIA, the probability of bidders attempting a second tender offer, the probability of bidders being

[25] Ben-Akiva and Lerman (1985). Wrigley (1985). Train (1986) and Greence (1990) provide a detailed

subject to an acquisition attempt, and the probability of bidders maintaining the status quo should be independent of each other.

However, if Bidder A believes that he can achieve the same gain by either attempting another acquisition or being a target, then, when the possibility of being a target is allowed, we may expect P(BIDDER) and P(TARGET) each to be 0.3, and the P(NA) to remain 0.4. Now the ratio of P(NA) and P(BIDDER) has changed from 2/3 to 0.4/0.3 = 4/3; hence, the assumption of IIA is violated. In this case, the use of the multinomial logit model to estimate the likelihood of the three mutually exclusive events will overestimate P(BIDDER) and P(TARGET), and underestimate P(NA). The multinomial logit model cannot be applied here.

In cases where the IIA assumption is violated, the multinomial probit model can be used to estimate the likelihood of three events. In this model, the choice probabilities are no longer independent of each other. Hence, in the multinomial probit model, the three events are assumed jointly normally distributed. Each event probability can have a different variance and can be correlated with other event probabilities. The multinomial probit model has relaxed the restrictions of the multinomial logit model, but the disadvantage of using the multinomial probit model is the computational difficulty in estimation.

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discussion of this assumption.

In order to detect violations of the IIA assumption, Ben-Akiva and Lerman (1985) suggest a test involving comparisons of logit models estimated with subsets of alternatives from the full set of alternatives. Therefore, a comparison of the binary logit models estimated with subset events with the multinomial logit model estimated with the full set events (three mutually exclusive events) is examined in this study. The subset events are any two events chosen from the three mutually exclusive events. If the IIA assumption holds for the full set events, then the coefficient estimates obtained from the multinomial logit model should be consistent with the coefficient estimates obtained from the binary logit model estimated with the subset events.

A correct approximate likelihood ratio test proposed by Small and Hsiao (1985) is conducted to test the null hypothesis of the IIA assumption. The test statistic is

$$\frac{1}{1-N_1/(\alpha N)}\left\{-2\left[L\left(\beta_F\right)-L\left(\beta_S\right)\right]\right\}, \tag{24}$$

where N is the number of observations in the full set events estimation, N_1 is the number of observations in the subset events estimation, and $\alpha \geq 1$ is a scalar. The scalar for coefficients i and j is

$$\alpha_{i,j} = \frac{\sigma_{S,i,j}}{\sigma_{F,i,j}}, \tag{25}$$

where $\sigma_{S,i,j}$ is the covariance of coefficients i and j in the covariance matrix of subset events logit estimation, and $\sigma_{F,i,j}$ is the covariance of coefficients i and j in the covariance matrix of full set events logit estimation. The α used in Equation 24 will be the maximum, $\alpha_{i,j}$, and the minimum, $\alpha_{i,j}$. $L\left(\beta_F\right)$ is the likelihood function of estimated

coefficients from the full set events and $L\left(\hat{\beta}_S\right)$ is the likelihood function of estimated coefficients from the subset events. The statistic is χ^2 distributed with $\tilde{K}$ degrees of freedom; $\tilde{K}$ is the number of estimated parameters in the subset events estimation.

4.3 Cox Proportional Hazard Model

The Cox Proportional Hazard model is extensively applied in medical studies to determine if the survival times of patients after diagnosis of a disease depends on predictor variables, such as the severity of the disease, the treatment method, and the general condition of the patient. This model has also been applied to economic problems, such as determining the length of strikes, the duration of unemployment and employment, and the duration of the use of welfare etc.[26] Nevertheless, these ideas are also useful in mergers and acquisitions where the emphasis is on failure times rather than survival times. In this study, the Cox Proportional Hazard model is used to estimate the distribution of time until bidders become involved in another acquisition activity (the failure time) which depends on the characteristics of bidder firms and their first acquisitions.[27] The failure times and survival times are discussed in the following section.

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[26] These issues have been studied by Lynch (1991), Gritz (1993), Ondrich and Schnell (1993), Torelli and Trivellato (1993), Van, Lindeboom, and Ridder (1994), Pudney and Thomas (1995),Cragg (1996).

[27] Bidders becoming involved in another acquisition activity combines bidders being a target and bidders making an attempt.

4.3.1 Survival Theory

There are three basic functions which describe the survival experience. The failure density function, f(t), defines the pattern of the bidders being involved in acquisition activity at a point in time.

$$f(t) = \lim_{\Delta t \to 0^-} [\Pr (t \le T < t + \Delta t)/ \Delta t] \qquad (26)$$

where T is the time of the bidders' involvement in acquisition activity.

The survival function, S(t), describes the probability of a bidder not being involved in any acquisition activity in the period from 0 to t. The acquisition activity includes attempting a second bid or being the target of a bid.

$S(t) = \text{Prob}\ (T \ge t)$ $\qquad$ $S(t) = 1$ at $t = 0$

$f(t) = 1 - S(t)$ $\qquad$ distribution of time until bidders become involved in acquisition activity

The third function, the Hazard function, H(t), describes how likely bidders are to become involved in acquisition activity which has not already occurred. The hazard function is used to capture any censored cases.[28] The censored cases are the bidders who do not become involved in acquisition activity before the end of study.

$$H(t) = \lim_{\Delta t \to 0^-} [\Pr (t \le T < t + \Delta t \mid T \ge t)/ \Delta t] \qquad (27)$$

As these three basic functions describe the same survival process, they are closely related.

$$f(t) = -dS(t)/dt \qquad (28)$$

[28] See Lancaster (1990) for detail of hazard function.

$$S(t) = \exp[-\int_0^t H(u)\,du] \quad (29)$$

$$H(t) = f(t) / S(t) \quad (30)$$

Consequently, describing one function implies the other two. As the failure and survival functions are very hard to estimate or characterize, one has to concentrate on the hazard function.

4.3.2 The Cox Proportional Hazard Model

The Cox model allows one to estimate the probability distribution of event times as a function of the proposed explanatory variables. The explanatory variables used here are the same as those used in the multinomial logit model. The bidders attempting a second acquisition and being subject to an acquisition attempt are grouped into one category, bidders being involved in acquisition activities. The Cox (1972) proportional hazard model is:

$$H(t) = [H_0(t)]\exp(BX) \quad (31)$$

If both sides of Equation 31 are divided by $H_0(t)$, the result is

$$H(t) / H_0(t) = \exp(BX) \quad (32)$$

and the Relative Hazard Function as

$$\ln [H(t)/H_0(t)] = BX \quad (33)$$

where: X is a covariate vector

B is a vector of regression coefficients

exp is the base of the natural logarithm

$H_0(t)$ is the baseline hazard function when Xs are set to zero (expected likelihood of bidder being involved in acquisition activity without the characteristic of their first acquisitions and their firms).

The quantity $\ln[H(t)/(H_0(t))]$ is used to compare the relative likelihood of bidders being involved in acquisition activity with and without the characteristics of first acquisition and firm.

The model implicitly contains two assumptions.[29] The first assumption is that the relative hazard function is constant through time. The different sets of covariates (independent variables) do not depend upon time. This assumption implies that the characteristics of bidders at the time of entry to the state under study are relevant for the study period and do not change overtime. Hence, in this study, the characteristics of bidders are assumed constants. In other words, the hazard function H(t) for the model that includes a particular covariate is proportionally related to the baseline hazard, $H_0(t)$. It is expected that H(t) and $H_0(t)$ are in constant proportion to one another; that is, they are related to one another as a power of *exp*. This is implied in Equation 32.

The assumption of proportional hazards is evaluated by stratifying the overall sample on the basis of a covariate and estimating a hazard function based on each strata. A useful plot for determining whether the assumption of proportional hazards is appropriate is the log minus log (LML) plot of the survival function versus time. If the

[29] BMDP Statistical Software (University of California Press, 1985), p.577.

hazards are proportional, the curves generated by LML should be parallel or near parallel lines.[30]

The second assumption of the model is the log-linear effect of the covariates upon the hazard function, H(t), implied in Equation 33. The goodness-of-fit is defined as the ln(-lnS(t)) which equals the natural log of the cumulative hazard function. If Equation 33 holds, there is a log-linear relationship between the covariates and the cumulative hazard function, and the right-hand side of Equation 33 resembles an ordinary linear regression, BX. The cumulative hazard function, therefore, is expected to be a linear function of t.[31]

A problem arising in the use of the Cox model is due to the issue of continuous versus discrete time. The hazard approach is based on continuous time and, therefore, assumes that the time until two bidders being involved in acquisition activity cannot be the same. For example, if two bidders become involved in acquisition activity 365 days 10 hours 5 minutes 1 second after their first acquisitions, the problem of "tied" observations occurs. The tied observations cause difficulty in estimation because the hazard model makes use of the temporal ordering of the observations and, therefore, cannot be directly applied to the case of ties where the time until two bidders being involved in acquisition activity coincides.[32]

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[30] SPSS Advanced Statistics 7.5 for Windows. 1997. p.304.
[31] In Equation 33, $H_0(t)$ is as a standardization and is constant through time.
[32] S.A. Betton. 1987. Bankruptcy: A Proportional Hazard Approach . MSc Thesis. University of British Columbia. 58-59.

However, in practice, the acquisition process cannot be determined by continuous time periods, and discrete time periods have to be used; hence, the problem of "tied" observations arises. This study measures the failure time in days, and there are five pairs of bidders involved in the second acquisition activity in the same number of days after their first acquisitions. In order to solve the problem of tied observation, a 0.25 day will be added to one of the bidders in each pair of tied observations.

5. Empirical Results

5.1 Abnormal Returns

5.1.1 Announcement Day Effects

The abnormal return around the bidders' first tender offer and second tender offer contest announcement days is examined first. The behavior of the average abnormal returns (AAR) and cumulative average abnormal returns (CAAR), and tests of their significance for the period -5 to +5 days relative to the first announcement day (t=0) for the total sample of 366 bidders are presented in Table 14.[33] The CAAR from -5 to +5 is -0.68%. This value is not significant. It is consistent with previous studies that bidders, on average, do not earn significant abnormal returns around the announcement. The AAR on two days prior to the first announcement of tender offer proposal (t=-2and t=-1) are

[33] Only 346 bidders are examined on the first tender offer announcement effect because 20 bidders are missing data on the estimation and event period.

0.25% and -0.34%, respectively. Both values are significantly different from zero at the 0.01 level.[34]

Table 15 shows the abnormal returns around the second tender offer announcement date by bidders attempting a second acquisition and bidders being targets. The bidders attempting a second tender offer earn an insignificant CAAR -0.52%. The market reacts similarly to the bidders' first and second tender offers. This implies that, at the announcement, the market reacts similarly to bidders with and without acquisition experience.

The AAR for bidders being targets at the second tender offer shows a significant abnormal return around the announcement date. Bidders becoming targets at the second tender offer experience an abnormal return of approximately 44% from five days before the announcement date to the announcement date. Jensen and Ruback (1983) show that targets, on average, experience a significant 30% abnormal return in tender offers. Therefore, corporate takeovers generate positive gains, and target shareholders reap substantial gain from the takeovers and bidder shareholders do not lose.

Table 16 presents the difference between the bidders' first and second tender offers by the characteristics of tender offers. The table shows that none of the first tender offer characteristics are significantly different from the second ones. The offer premium increases from 52.39% to 77.58%, and the percentage of success increases from 49.45%

[34] The significance may be caused by the method of payment in the acquisition. Travlos (1987) finds that shareholders of acquiring firms experience significant losses around the acquisition announcement when

to 59.80%, but neither difference is significantly different from zero. It is consistent with economic theory which suggests that the probability of tender offer success should be positively related to the size of the bid premium. Walkling (1985) also finds that higher bid premiums increase the amount of shares being tendered, hence, increasing the probability of tender offer success.

As expected, abnormal returns in the bidders first contests are different from those of bidders becoming targets in the second tender offer contest. The bidder being a target at the second tender offer has a 29% two-day abnormal return [-1,0] around the announcement date. As expected, the abnormal return to being a target is greater than the abnormal return to being a bidder, and the difference is significantly different from zero. However, the percentage of success and the percentage of hostile contests differ between the first contest and second contest where bidders become targets. The percentage of success increases from 49.45% in the first contest to 90% in the second contest where bidders become targets and the difference is significantly different from zero. While the percentage of hostile contests increases from 24.32% in the first tender offer to 48% in the second tender offer contest, the difference is not significantly different from zero. This result suggests that if the bidders are subsequently subject to an acquisition attempt, the attempt is likely to succeed.

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they acquire firms through an exchange of common stock and insignificant losses for firms using cash.

5.1.2 Long-term Performance

In an efficient market, the stock prices of bidders should fully reflect the efficiency gains from their acquisitions. The differential efficiency theory of mergers and acquisitions suggests that a form of synergy would be achieved by combining the activities of two firms. If this assumption holds, the bidders should have a significant post-acquisition abnormal return. Table 17 reports the buy-and-hold returns for the sample firms, the matching firms, and the buy-and-hold abnormal returns for the sample firms over the appropriate period (five years for status quo, or from the day after the first tender offer contest ending date until the second acquisition).[35] The results show that the overall sample of 310 bidders has an average five-year buy-and-hold return of 93.43% compared to 77.41% for their matching firms.[36] The difference is an insignificant 16.02% abnormal return (t-statistic 1.45). Agrawal, Jaffe, and Mandelker (1992) point out that there is no significant abnormal return for acquiring firms over five-year periods after the effective date. Our findings suggest that the bidders do not benefit from the acquisitions in the long-term.

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[35] 1. The buy-and-hold abnormal return starting from the month after the month the first tender offer ended to the second tender offer announcement month was first calculated. The abnormal returns are highly significant, especially for bidders being targets at the second tender offer. Targets in general earn significant abnormal returns around the announcement date. Hence, it is inappropriate to include the announcement month for long-term performance because the highly significant announcement effect may induce a bias in long-term performance. (See Appendix I) 2. Then, the buy-and-hold abnormal return is calculated starting from the month after the first tender offer ending month, to the month before the second tender offer announcement month. After excluding the announcement effect, the value and significance of abnormal returns drops dramatically. (See Appendix II) 3. Finally, the buy-and-hold abnormal return is calculated from the day after the first tender offer ending date to five trading days before the second tender offer announcement date. The reason for choosing five trading days before the second tender offer announcement date is to exclude the announcement effect of the second tender offer. Table 15 shows that five trading days before the second tender offer announcement do not incorporate the announcement effect. The result on method 2 and method 3 is similar.

[36] 56 bidders are not included in the sample because of missing data of both size and book-to-market to pair the matching firms.

Jensen (1988) finds that bidders tend to have significant and positive stock performance prior to acquisition. Magenheim and Mueller (1988) find that bidders earn a significant 18% abnormal return in the two years preceding acquisitions. Therefore, we would expect that firms would have good performance before their acquisition attempts. However, our results indicate that bidders earn a total of 28.66% abnormal return (t-statistic = 1.40) over the period from the end of the first acquisition to five days before the second acquisition, which does not support the findings by Jensen (1988) and Magenheim and Mueller (1988). One possible reason for different results is that Jensen (1988), and Magenheim and Mueller (1988) estimate the long-term abnormal return using the market model. Kothari and Warner (1997) find that the market-model is severely positively misspecified.

5.1.3 Impact of Misspecification

Kothari and Warner (1997) find that four models, which are commonly employed in the estimation of long run abnormal returns, are severely positively misspecified. They are the market-adjusted model, the market-model, the CAPM, and the Fama-French three-factor model. The market-adjusted model is included in our study to illustrate how the misspecification may affect the long-term abnormal return estimation.[37]

Table 18 shows that the market-adjusted model, on average, generates significant positive abnormal returns for all bidders. Kothari and Warner (1997) find that the market-adjusted model induced a 5.3% buy-and-hold abnormal return over a three-year horizon.

Our results show that the market-adjusted model finds a 19.7% buy-and-hold abnormal return for all bidders over the five year horizon; in contrast, the matching procedure indicates only a 16.02% buy-and-hold abnormal return over the same period (See Table 17). The market-adjusted model therefore appears to have induced an additional 3.68% buy-and-hold abnormal return over the five-year horizon, which is consistent with the finding by Kothari and Warner (1997).

5.2 Logit Model

5.2.1 Multinomial Logit

The abnormal return analysis finds that bidders do not earn a significant positive gain in the short-term and the long-term. The motivations of bidders to attempt another acquisition need to be examined. Table 19 presents the results obtained using the multinomial logit procedure and the variables described in Table 2. Note that each estimation yields two vectors of coefficient estimates, one relating to the probability of bidders attempting a second acquisition, P(BIDDER), and one relating to the probability of bidders being subject to an acquisition attempt at the second tender offer, P(TARGET). The five estimations reported in the table include different sets of independent variables.

Our findings show that the management performance, operational performance, level of leverage, free cash flow, insider ownership, and antitrust policy significantly

[37] The market-adjusted model is used because it does not require estimation period parameter estimates.

affect the conditional probabilities of bidders attempting another acquisition and bidders being subject to an acquisition attempt.[38]

Both proxies for operational performance (ROA and ASSET) have a negative and significant impact on both P(BIDDER) and P(TARGET), with greater absolute value and statistical significance in the case of P(TARGET). This finding is consistent with the differential efficiency in the acquisition process. The firms with low operational performance are attractive targets because of the potential gains associated with improving the firms' performance and maximizing the value of their resources.

Like operating performance, the proxies for management performance (SALES and ROE) have a significantly negative impact on both P(BIDDER) and P(TARGET). The greater absolute value and significance in P(TARGET) indicates that firms with less efficient management are more likely to be acquired. One of the functions of the acquisition is to drive out the inefficient management and improve the managerial performance of the firm. This is consistent with the motivation of replacing bad managers and lowering agency costs.

DIV is the only proxy of free cash flow significantly positively related to the P(BIDDER) and P(TARGET). The previous literature review suggests that paying out free cash flow to shareholders will reduce agency costs, thereby reducing the probability

[38] To determine the impact of a change in variables on the probabilities of events, the elasticities have to be examined. Unlike ordinary least squares where the change in dependent variables with respect to the change in independent variables is β (the coefficients), in the multinomial logit model, the change in an independent variable affects the probability of all events simultaneously. (See Equation 22).

of being acquired. However, if the managers are the manifestation of agency problems, firms with a high dividend payout may reduce the payout in order to invest in acquisitions that allow managers to retain control of corporate resources.

The proxy for level of leverage (LEV) is significantly negatively related to both the P(BIDDER) and P(TARGET). Bidders with low levels of leverage increase the P(BIDDER). Bidders can increase their levels of leverage by acquiring a firm with borrowed money, thereby reducing the free cash flow, and hence, reducing the agency cost. Also, bidders with low levels of leverage can borrow the money at a lower cost. They can acquire highly leveraged firms with many investment opportunities and create value by making those investment opportunities using their idle capital.

The insignificant coefficients of YearAR, Premium, Cashflow, Lnsize and the proxies for hubris hypothesis (Result and React) suggest that none of them significantly influences the P(BIDDER) and P(TARGET).

Insider Ownership, 5-25% and >25%, can be predicted to play different roles in distinguishing the P(BIDDER) from the P(TARGET). As expected, the coefficients of insider ownership between 5-25% are negative and significant in explaining the P(Bidder), and are positive and significant in explaining the P(Target). This observed distinction is consistent with the hypothesized role of management entrenchment. Bidders' managers control a fraction of the firm's equity which has enough voting power or influence to indulge their preferences for non-value maximizing behavior. This

entrenchment behavior may entail a penalty in terms of the market valuation of the bidder firms. Morck, Shleifer and Vishny (1988) find a negative relation between the management ownership range of 5%-25% and the market valuation of a firm's assets. The value of the bidder firms declines when the managers are not acting to maximize the value of firms. The takeover is used to correct the non-value-maximizing practices of managers. These bidder firms, then, are likely to be targets.

The convergence-of-interest hypothesis can explain the positive and significant impact on P(BIDDER), and negative and significant influence on P(TARGET) by the insider ownership above 25%. As the managers hold a substantial fraction of the firm's stocks, they may be less likely to follow non-value-maximizing objectives, such as seeking to diversify the firm, because they also bear a large portion of the cost of non-value-maximizing behavior.[39] The opportunity cost is large for squandering corporate wealth. According to this convergence-of-interest hypothesis, market value increases with a substantial management ownership. Our findings show that P(BIDDER) will be increased by good management performance, and P(TARGET) will be decreased because the firm becomes an unattractive target.

The significantly negative impact on both P(Bidder) and P(Target) by variable POLICY is not consistent with the expected impact of the change in antitrust policy in 1982. It is expected that the new antitrust policy would decrease the chance of bidders being challenged by antitrust, hence, increase P(BIDDER). One explanation for the

[39] However, if the managers hold 90% of the firm, they may follow a diversification objective, because their wealth is concentrated in the firm. Consequently, the relationship between P(BIDDER) and

decrease in P(BIDDER) associated with variable POLICY may be that this variable incorporates part of the effect of the Tax Reform Act of 1986.[40] The new tax act reduces the incentives for acquisitions. For example, Greenmail payments could no longer be deducted for tax purposes, and also limits were placed in loss carry forwards. These changes reduce the potential tax benefits from mergers and acquisitions. Bidders would therefore be less likely to attempt another acquisitions after 1986; hence, bidders who made a first attempt after 1986 are less likely to make another attempt and P(BIDDER) would be decrease.

A dummy variable of TAX is added into the model to check whether the POLICY effect incorporates the effect of tax reform in 1986. If the significant negative impact on P(BIDDER) by POLICY was induced by a significant decrease in incentives for acquisition after 1986, the sign of POLICY should be changed after introducing the TAX dummy variable. TAX equals 1 if the first acquisition occurs after 1986 and equals zero otherwise.

Table 20 reports that the TAX dummy variable has a significantly negative impact on both P(BIDDER) and P(TARGET). It is consistent with the nature of the Tax Reform Act in 1986 which reduces the profit from acquisitions; so, bidders are less likely to make another acquisition attempt. The variable POLICY still has a significantly negative influence on both P(BIDDER) and P(TARGET) but less significance than reported earlier

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P(TARGET) and the level of management ownership may be nonlinear.

[40] The impacts on merger and acquisition by Tax Reform Act 1986 are discussed in detail in Weston, J. F., 1990, Mergers, Restructuring, and Corporate Control, p.308-309.

in Table 19. This finding indicates that the variable POLICY incorporates part of the effect of Tax Reform Act 1986.

With the unexpected result from POLICY, a further examination was carried out to determine the impact of the antitrust policy change in 1982. Two dummy variables (Y82-86 and Year80) are introduced. Y82-86 is 1 if bidders made the first attempt between 1982-1986 and is zero otherwise. This dummy variable would only capture the effect of the change in antitrust policy. Year80 is 1 if bidders made the first attempt in 1980's and is zero otherwise. However, variable Y82-86 also shows a negative and significant impact on both P(BIDDER) and P(TARGET). It implies that the change in antitrust policy did not motivate bidders to make a second acquisition attempt through a tender offer. The negative coefficient in Year80 implies that bidders who made the first attempt in the 1980's are less likely to attempt another acquisition via a tender offer. Hence, it can be concluded that the negative impact on P(BIDDER) and P(TARGET) were not induced solely by the antitrust policy change.

Under the volatile policy environment of the 1980's, bidders who realize no significant gain after their first acquisition attempts in that decade seem to be hesitant to make another tender offer. It is because they are facing uncertainty on unstable policy and find little incentives for making another attempt.[41] The firms which were less experienced in the market for corporate control do not realize that there is no significant gain

[41] The unstable policy environment is induced by frequent changes in tax and antitrust policy. The changes in tax policy include the Economic Recovery Tax Act (ERTA) in August 1981, the Tax Equity and Fiscal Responsibility Act of 1982, the Deficit Reduction Act of 1984, and the Tax Reform Act of 1986. The changes in antitrust policy include the new Merger guidelines in 1982 and 1984.

associated with the acquisition. Although these firms are also facing the volatile policy environment of the 1980's, they still believe that a sufficient gain can be achieved by the acquisition to compensate for this volatility. Table 21 shows that 220 bidders made their first tender offer attempts in the 1980's, but only 19% of them made another tender offer attempt in the following five years.

5.2.2 Test of IIA Assumption

Although the overall multinomial logit models presented in Tables 19 and 20 are significant at the level of 0.01, the assumption of the independence from irrelevant alternatives or IIA must be tested to ensure the validity of the model.

First, the estimated coefficients obtained from the full set events (three mutually exclusive events) in the multinomial logit model are compared to the estimated coefficients obtained from the subset events in the binary logit model. There are three possible subset events: 1. P(BIDDER) vs. P(NA), 2. P(TARGET) vs. P(NA), 3. P(BIDDER) vs. P(TARGET). The first two subset events are chosen to be tested because their estimated coefficients are comparable to those in the multinomial logit model. In this model, P(BIDDER) and P(TARGET) are estimated relative to the reference event, P(NA).

The estimated coefficients reflect the ratio of the events. If the IIA assumption holds, the ratio of any two events is entirely unaffected by the third event. Therefore, it is expected that the value of estimated coefficients obtained from the multinomial logit

model would not be significantly different from those obtained from the binary logit model, where the binary logit model excludes any event of the three mutually exclusive events. Table 22 presents the estimated coefficients obtained from both sets of events. It can be seen that the estimated coefficients obtained from both models are very different. Most of the coefficients of the subset events are outside three standard errors of those of the full set events. The values of the coefficients for P(BIDDER) change a great deal from the full set events to the subset events. It implies that the ratio of P(BIDDER) vs. P(NA) is affected by P(TARGET). Also, the ratio of P(TARGET) vs. P(NA) is affected by P(BIDDER). Hence, the IIA assumption does not appear to hold in this situation.

The corrected approximate likelihood ratio statistic proposed by Small and Hsiao (1985) are also conducted to test the validity of the IIA assumption. The calculation of corrected approximate likelihood ratio statistics is defined in Equation 24. Tables 23 and 24 display the covariance matrix for the full set events and subset events, and Table 25 shows the scalars which are obtained based on Tables 23 and 24. The scalar is defined in Equation 25. It can be seen that the scalar varies from –54 to 108 for P(BIDDER) and -172 to 1228 for P(TARGET). The scalar must be at least 1 in the calculation for this statistic. Then, the scalar from 1 to 108 and 1 to 1228 would be used in the calculation for this statistic for P(BIDDER) and P(TARGET), respectively. Table 26 shows that the corrected likelihood ratio statistic (in estimation 2) ranges from 167.85 to 468.237 for P(BIDDER) and 154 to 532.194 for P(TARGET). These values are compared to the critical chi-square value with 8 degrees of freedom (the number of parameters in the subset of events shown in Table 22.) and 95% confidence level, which is 15.51. Hence,

the null hypothesis of the IIA assumption is rejected at this level of significance; even if the level is increased to 99.5%, which is 21.96, the null hypothesis is still rejected. Again, the IIA assumption is rejected by corrected likelihood ratio statistics. In conclusion, the multinomial logit model is inappropriate for this data set.

Although the multinomial logit model is misspecified here, the findings suggest two avenues for future research. First, the proxies for operational performance (ROA and ASSET), managerial performance (SALES and ROE), free cash flow (DIV), and level of leverage (LEV) have an impact on P(BIDDER) and P(TARGET), even though they could not distinguish the P(BIDDER) from P(TARGET). Therefore, the multinomial probit model should be used to estimate the probability of these three events using these independent variables. Due to the computational difficulty in the multinomial probit model, it is not conducted in this study. Second, the proxies for managers' entrenchment behavior (5-25% insider ownership) and convergence-of-interest behavior (>25% insider ownership) are the only variables able to distinguish P(BIDDER) from P(TARGET). This finding suggests that managers' behavior have an influence on P(BIDDER) and P(TARGET). Other variables, such as compensation plans, Tobin'q, and measurements of managers' objectives, may be included in the multinomial probit model to examine the relationship between the managers' behavior and the three events.

5.2.3 Binary Logit Model

Since P(BIDDER) is not independent from P(TARGET), we will group bidders attempting another acquisition and bidders being subject to an acquisition attempt into

one category which reflects bidders being involved in acquisition activity. A binary logit model can then be conducted to examine the probability of bidders being involved in a tender offer within five years of the first acquisition attempt.

Table 27 presents the binary logit regressions for bidders being involved in acquisition activity and not being involved in acquisition activity. Not surprisingly, the financial variables, ROE, ROA, ASSET, LEV and SALES, which were very significant in the multinomial logit model, are insignificant in the binary logit model. The insider ownership in the range of 5%-25% and above 25% are both significant in the multinomial logit model but insignificant in the binary logit model. Two variables, YearAR and PREMIUM, are not significant in the multinomial logit model but are significant in the binary logit model. Only POLICY and DIV do not change significantly from the multinomial logit model to the binary logit model. These dramatically different results obtained from the different logit models are due to the misspecification induced by misuse of the multinomial logit model. The invalid multinomial logit model will overestimate the probability of one event and underestimate the probability of another event.

Only four variables, POLICY, YearAR, Premium, and DIV, are significant in predicting the bidders' subsequent involvement in acquisition activity. POLICY has a negative and significant impact on bidders' involvement in acquisition activity. As mentioned previously, the 1982 antitrust policy has a significant negative impact on bidder involvement in acquisition activity due to the volatile policy environment. The

bidders are facing an unstable policy environment and also experience no significant gains from the acquisition; hence, the incentives for bidders attempting another acquisition are reduced.

YearAR is a proxy for management performance. The significantly positive sign of YearAR suggests that the bidders' managers who have good managerial performance are more likely to become involved in tender offer contests. Jensen (1988) discusses the theory of a market of corporate control where good managers are the winners in the battle for control of corporate resources.

PREMIUM is a measure of free cash flow. The significantly negative sign of PREMIUM suggests that bidders who paid a high premium in their first acquisition are less likely to make a second acquisition attempt. Bidders who spend a lot of money on the first acquisition may have less free cash flow to make other investments, such as acquisition. The bidders would be more likely to wait and maintain the status quo until they have enough free cash flow to make another acquisition.

The significant positive relationship between the dividend payout and bidder involvement in acquisition activity can be explained by agency problems. A high dividend payout ratio indicates that corporate resources are leaving management's control. If the managers are a manifestation of the agency problem, bidders with high dividend payout may reduce the payout in order to invest in acquisitions that allow managers to retain control of corporate resources.

Under the multinomial logit model, it would appear that insider ownership in the range of 5-25% and above 25% are the important variables to explain the rationales of bidders attempting another acquisition, and bidders being subject to an acquisition attempt. Although the assumption of the multinomial logit model is violated, the findings provide some fruitful implications for future research. Meanwhile, in the binary logit model, the proxies for free cash flow (Premium and DIV) and the proxy for management performance (YearAR) are the important variables to explain the probability of bidders' involvement in acquisition activity in the five years after their first acquisitions.

5.3 Cox Proportional Hazard Model

In addition to the previously defined explanatory variables, a time variable is included in the study to examine the probability of an event's occurrence in a specific length of time. The Cox Proportional Hazard model is estimated to examine the probability of bidders being involved in acquisition activity in the two years and the five years after their first acquisitions. It was estimated by using the SPSS Statistical Software.

The overall set of variables (covariates, as they are called in the Cox Model) is found in Table 2. The results of the Cox estimation of the two-year and five-year prior data sets are found in Tables 28 and 29. The overall significance of both Cox estimations are very good, as illustrated by the p-values, most of which are less than 5%

As the signs of the coefficients are of great importance, the coefficients are tested to determine if the observed sign is significant using t-statistics. The results of these tests are presented in Tables 28 and 29. It would appear that the results of the Cox model in the two-year prior data set are different from those in the five-year prior data set. This finding suggests that the set of variables explaining the probability of bidders being involved in acquisition activity in five years are different from those in two years. In other words, different variables are more useful in explaining short-term behavior than in explaining long-term behavior.

ROE, ROA and SALES are not significant in the two-year prior data set, but negative and significant in the five-year prior data set. This result suggests that better operational and managerial performance significantly reduces the probability of bidders becoming involved in acquisition activity in the five years after the first tender offer. However, these variables do not have significant explanatory power for the probability of bidders being involved in tender offers in the two years following the initial contest.

ASSET and LEV have significantly negative signs in the two-year and the five-year prior data sets, with smaller value and greater statistical significance in the two-year prior data set. This finding suggests that bidders with a high level of leverage and high asset turnover are more likely to become involved in acquisition activity in two years than in five years.

YearAR and REACT are positive and significant in the two-year prior data set but not in the five-year prior data set, which implies that bidders with high annualized abnormal returns are more likely to become involved in acquisition activity in two years. Magenheim and Mueller (1988) find that bidders earn a significant positive abnormal return in the two years preceding the acquisition.

The significantly positive coefficient of REACT suggests that bidders, who received a hostile reaction from target management in their first acquisitions, are more likely to become involved in acquisition activity in the next two years. This finding can be explained by the hubris hypothesis. When the bidders' managers made the first attempt because of their excessive hubris, they believed that their valuation of target was right. If the target management believes the offer is unfair, fraudulent, or inadequate, they would take actions to prevent the takeover bid, such as antitakeover tactics. Therefore, bidders may have to raise the premium in order to increase the likelihood of a successful takeover. The larger premium offer then reduces the synergy gains, if any, from the takeover. If there are little synergy gains associated with the offer, the bidder is worse off if the takeover is successful, because the high premium wipes out the small synergy gains and may even reduce the value of the bidder firms. Hence, the bidder would become an attractive takeover target. Also, bidders who received a hostile reaction from target management and failed to acquire the target carry substantial costs of failure. Easterbrook and Jarrell (1984) and Pound (1986) find a significant negative return following unsuccessful takeover contests. This is consistent with a reduction in the value of bidder firms, and hence, increases the probability of being a target.

CASHFLOW and DIV have a significantly positive influence on the probability of bidder involvement in acquisition activity in two years and five years. This suggests that bidders with a high free cash flow and dividend payout are likely to become involved in acquisition activity in two years and five years. Consistent with the free cash flow hypothesis, managers tend to waste the excess cash flow through organizational inefficiencies. The acquisition is the resolution of these agency problems that are caused by managers' control over free cash flow. Hence, it increases the probability of the bidder being involved in subsequent acquisition activity. When the managers are a manifestation of the agency problem, bidders with a high dividend payout may reduce the payout and invest in acquisitions to reduce the agency problem.

The insignificant coefficients of RESULT, PREMIUM and LNSIZE in the two-year and five-year Cox models suggest that none of them significantly explains the probability of bidder involvement in either two years or five years.

It appears that the sets of variables predicting the probability of bidders being involved in acquisition activity in five years are different from those in two years. Market variables (YearAR and REACT) and the financial variables (except ROE, ROA and SALES) are good predictors in the two-year prior data set. However, only the financial variables are good predictors in the five-year prior data set. It implies that some variables predict the probability of an event's occurrence in the short-run better than in the long-run, and vice versa.

In the short-run, the market variables, such as YearAR and REACT, predict the probability of the event occurrence better than in the long-run. YearAR reflects the market expectation of bidder firms, and the REACT is the target management reaction where their reaction is based on the offer price compared to the market price. In five years, the market information may incorporate many other pieces of information about the firm. In two years, however, the market information appears to be cleaner than in five years.

Unlike the market variables, the financial data reflect the firm's situation not only in the short-term, but also in the long-term. General-purpose financial data, which describe the past, provide one basis for projecting future earnings power and potential growth. It is because the firm generates the earnings through existing assets; hence, the existing assets position can reflect information regarding the firm's future earnings power, profitability, and financial situation, etc.

The sign and significance of variables in the Cox model are very different from those in the binary logit model. Table 30 summarizes the sign and significance obtained from the binary logit model, and the Cox models in the two-year and five-year prior data sets. It is because the binary logit model only estimates the probability of the event's occurrence, while the Cox model estimates the probability of the event's occurrence at a specific point in time conditional on the event not having occurred yet. The different value and significance of variables imply that the variables' predictive powers are affected by the timing of the event. It would appear that all financial variables, (except

DIV) which are insignificant in the binary logit model, become significant in the Cox model because the usefulness of financial variables to predict events is dependent on time. The difference may also be caused by the Cox model dealing with the censoring in the data. The binary logit model did not take into account that not observing activity in five years does not imply that the activity did not occur, only that it has not occurred yet.

The proportional hazard assumption was tested using the graphical technique discussed previously. Figures 1 and 2 illustrate the plot of log-minus-log survival function versus time for ASSET and DIV. The results for other strata covariates can be found in Appendix III. These graphs indicate that the proportional hazard assumption is appropriate.

Goodness-of-fit of the estimated hazard function was also evaluated by the cumulative hazard plot. Figures 3 and 4 show the goodness-of-fit of the first estimation in the two-year and five-year prior data sets, respectively. As can be seen in this case, the "fit" line was reasonably straight. The results for some of the equations can be found in Appendix IV. The goodness-of-fit appears to be relatively straight and the overall regression is significant.

6. Conclusion and Implication

This thesis examines the motivations behind the bidders' second tender offers for a sample of 366 bidders who made the first attempt over the period of 1976-1990. The motivations of the bidders 1) attempting a second acquisition, 2) being subject to an

acquisition attempt, and 3) maintaining the status quo in the five years after the first tender offer were examined by testing eight hypotheses: management performance, operating performance, free cash flow, level of leverage, insider ownership, premium, size, and antitrust policy.

The empirical results show that there is no significant abnormal return for bidders around the announcement date. We also find there is no significant difference between the bidders' first and second acquisitions based on their announcements' abnormal return and their characteristics of their tender offers. In the five years following the first acquisition, the bidders do not earn a significant abnormal return. Also, the results show that bidders do not have significant positive stock performance prior to the subsequent acquisition.

The rationales for bidders attempting a second acquisition, being subject to an acquisition attempt, and maintaining the status quo are examined by the characteristics of bidder firms and their first tender offers. These characteristics are grouped into eight hypothesized motivations which are tested by using the multinomial estimation procedure, which attempts to distinguish between the prospect of the P(Bidder) and P(Target).

The analysis, however, only yields one motivation that is consistent with our a priori expectations. Consistent with the expected effects of the convergence-of-interest and entrenchment hypotheses, management ownership in the range of 5%-25% is found

to reduce the P(Bidder) and increase the P(Target). Management ownership above 25% is found to increase the P(Bidder) and reduce the P(Target). Other hypothesized motivations failed to find important differences which might distinguish the P(Bidder) and P(Target).

However, the underlying assumption of the multinomial logit model is violated. The probabilities of the three events are not independently distributed, implying a misspecification of the model. The findings obtained from the multinomial logit model suggest that applying the multinomial probit model may yield valuable insights.

The results of the binary logit model find that good management performance, small initial offer premium, and high dividend payout increases the probability of bidders becoming involved in acquisition activity in the five years after the first acquisition. These findings are consistent with the hypothesized motivations of managerial performance and free cash flow.

The findings obtained from the Cox model show that bidders with better operational and managerial performance are less likely to become involved in acquisition activity in the following five years. Bidders with a high asset turnover ratio and a high level of leverage are less likely to become involved in acquisition activity in the following two years. When bidders have a high annualized abnormal return and receive a hostile response from target management to the initial acquisitions, they are more likely to have acquisition activity in the next two years. This finding suggests that the set of variables predicting the probability of bidders being involved in acquisition activity in

five years are different from those in two years. Market variables (YearAR and REACT) and financial variables have significant explanatory powers in the two-year model, and only financial variables have significant explanatory powers in the five-year model. The sign and significance obtained from the Cox model are different from those found in the binary logit model, because some variables are affected by the time dimension while others are not.

The findings of this study offer some directions for future research. One suggestion is to repeat this study using a multinomial probit model and examine the rationales for bidders' three events. Another fruitful area for additional research is to include other variables in the probit model, such as management compensation plan, Tobin's q, and other measures of managers' objectives. Further work should also concentrate on identifying the reasons for the decrease in the P(Bidder), the P(Target), and the probability of bidders becoming involved in subsequent acquisition activity in the 1980's.

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Table 1. Distribution of Tender Offers Challenged by Antitrust and Others.

Period	No. of Tender Offer	All	Antitrust	Others
Before June 14, 1982	188	27.66%	14.36%	13.30%
After June 14, 1982	178	16.29%	4.93%	12.36%

Note: Others include the state law, bidder shareholders and target shareholders.

Table 2. Hypothesized Motivations on Second Tender Offer and Independent Variables.

Hypothesized Motivations	Variable(s)	Expected Sign P(BIDDER)	Expected Sign P(TARGET)
Operating Efficiency	Return on Asset (ROA)	+	-
	Turnover Ratio (ASSET)	+	-
Management Performance	Annualized Buy-and-Hold Abnormal Return (YearAR)	+	-
	Return on Equity (ROE)	+	-
	Activity Efficiency (SALES)	+	-
Free Cash Flow	Cash flow(CASHFLOW)	+	-
	Dividend payout ratio(DIV)	+	-
	PREMIUM	-	+
Capital Structure	Level of Leverage (LEV)	-	+
Insider Ownership	5-25%	-	+
	>25%	+	-
Firm size	LNSIZE	+	-
Hubris Hypothesis	RESULT	+	-
	REACT	-	+
Antitrust Policy	POLICY	+	+

Note: See Table 3 for variable descriptions.

Table 3. Variable Descriptions.

Variable	Descriptions
Policy	Policy Change; Policy =1 if the first tender offer after June14, 1982; otherwise zero.
YearAR	Annualized Abnormal Return; Average Buy-and-Hold Abnormal Return.
Result	Result of First tender offer; Result =1 if the offer is successful, otherwise zero.
React	Target Management Reaction; React =1 if the target management reaction is Hostile, otherwise zero.
Premium	Offer price relative to stock price 60 trading days prior to offer.
Cashflow	(Operating Income before depreciation less interest expense, preferred and common dividends, and taxes) / Market value of equity of bidder.
Lnsize	Natural log of market value of equity of bidder.
ROE	Return on Equity; EBIT / Equity.
ROA	Return on Asset; EBIT / Total Assets.
ASSET	Turnover ratio; Current Assets /Total Assets.
LEV	Level of leverage; Total Liabilities/ Total Assets.
DIV	Dividend payout ratio;
SALES	Net sales / Total Assets.
5-25%	Insider Ownership; 5-25% =1 if Insider Ownership between 5% to 25%, otherwise zero.
>25%	Insider Ownership; >25% =1 if Insider Ownership over 25%, otherwise zero.

Table 4. Variable Summary Statistics.

Variable	N	Mean	St. Dev	Minimum	Maximum
Policy	366	0.49	0.50	0.00	1.00
YearAR	303	0.07	0.51	-2.09	3.06
Result	366	0.49	0.50	0.00	1.00
React	366	0.24	0.43	0.00	1.00
Premium	343	0.52	0.39	-0.50	3.61
Cashflow	284	0.93	8.45	-0.25	133.85
lnsize	339	5.41	1.80	0.56	9.90
ROE	295	0.12	0.47	-7.60	1.54
ROA	295	0.07	0.05	-0.21	0.29
ASSET	295	0.54	0.19	0.00	0.99
LEV	295	0.50	0.24	-2.79	0.97
DIV	294	0.35	1.02	-6.02	11.60
SALES	295	1.35	0.63	0.03	4.43
5-25%	204	0.28	0.45	0.00	1.00
>25%	204	0.20	0.40	0.00	1.00

Note: Each variable has different sample size because some bidders are missing those variables.

Table 5. Distribution of Three Mutually Exclusive Events by Non-CRSP Bidders.

Year after first acquisition	Non-CRSP Bidders attempting second acquisition	Non-CRSP Bidders being subject to acquisition attempt	Non-CRSP Bidders maintaining the status quo	Total
1	11	1		12
2	0	0		0
3	0	0		0
4	0	0		0
5	0	0	516	516
Total	11	1	516	528

Note: The three mutually exclusive events are non-CRSP bidders attempting second acquisition, being subject to acquisition attempt or maintaining the status quo—occurring within five years of bidders first acquisition in the period of 1971-1990.

Table 6. Distribution of Active Bidders by Year and Industry in the period of 1971-1990.

Year	A	M	C	M1	W	R	S	U	R1	Total
71	0	1	0	6	1	0	2	0	4	14
72	0	0	0	5	0	1	1	2	6	15
73	0	0	0	12	0	1	6	1	18	38
74	0	10	0	25	1	1	5	1	12	55
75	0	2	0	11	0	0	0	2	5	20
76	0	6	0	29	2	3	5	2	10	57
77	0	6	0	36	2	4	5	4	27	84
78	0	5	1	36	2	1	1	1	15	63
79	0	4	2	36	1	2	5	1	23	73
80	0	6	1	14	0	3	1	1	15	41
81	0	2	1	28	1	1	6	0	18	57
82	0	5	0	23	1	2	2	0	19	52
83	0	5	0	20	0	0	0	2	16	43
84	0	10	0	27	0	4	3	2	25	71
85	0	1	1	32	2	7	3	1	20	67
86	0	2	1	46	2	7	3	2	30	93
87	0	2	0	32	2	2	6	3	18	65
88	1	1	0	31	1	10	3	2	17	66
89	0	2	0	23	0	0	3	0	13	41
90	0	1	0	3	0	1	1	0	4	10
Total	1	71	7	474	18	51	61	27	315	1025

A: Agriculture, M: Mining, C: Construction, M1: Manufacturing, W: Wholesale, R: Retail, S: Services, U: Unclassified, R1: Regulated

Table 7. Sample Selection Procedure (Bidder).

Reason for Elimination from the sample	Number of bidders
First stage:	
Active bidders made tender offers between 1971-1990	1025
Eliminated because of regulated firms	315
Eliminated because of unclassified industry bidders	27
Remaining after bidder's identity screens	683
Second stage:	
Eliminated because bidders involved in tender offers prior to their tender offers made in the period of 1976-1990.	314
Eliminated because bidders had confounding special cases[a]	3
Remaining in the final sample	366

[a] The confounding special cases are bidders made the first and second tender offer on the same date.

Table 8. Distribution of Bidders' First Acquisition by Year and Industry in the period of 1976-1990.

Year	A	M	C	M1	W	R	S	Total
76	0	4	0	23	1	1	4	33
77	0	4	1	29	1	3	4	42
78	0	4	1	25	1	2	1	34
79	0	4	1	28	0	2	2	37
80	0	1	0	6	0	3	0	10
81	0	0	0	16	1	0	3	20
82	0	0	0	14	0	2	1	17
83	0	4	0	9	0	0	0	13
84	0	5	0	15	0	1	3	24
85	0	0	1	21	1	6	2	31
86	0	0	1	24	1	4	2	32
87	0	2	0	19	2	1	6	30
88	1	1	0	16	0	4	3	25
89	0	0	0	13	0	0	1	14
90	0	1	0	2	0	0	1	4
Total	1	31	5	261	8	30	33	366

A: Agriculture, M: Mining, C: Construction, M1: Manufacturing, W: Wholesale, R: Retail, S: Services

Table 9. Distribution of Three Mutually Exclusive Events by Year After First Acquisition (Bidder).

Year after first acquisition	Bidders attempting second acquisition	Bidders being subject to acquisition attempt	Bidders maintaining the status quo	Total
1	23	10		34
2	25	5		31
3	14	6		18
4	9	6		16
5	14	3	251	268
Total	85	30	251	366

Note: The three mutually exclusive events are bidders attempting a second acquisition, being acquired by another firm or maintaining the status quo—occurring in the five years following their first tender offers in the period of 1976-1990.

Table 10. Distribution of Active Targets by Year and Industry in the period of 1971-1990.

Year	A	M	C	M1	W	R	S	U	R1	Total
71	0	1	1	4	0	0	0	0	0	6
72	0	0	0	3	0	1	0	0	1	5
73	0	0	0	10	0	0	2	0	4	16
74	0	3	0	10	0	1	0	0	2	16
75	0	1	0	4	0	1	0	0	1	7
76	0	0	0	5	1	1	1	0	2	10
77	0	1	0	10	1	4	3	1	7	27
78	0	0	0	5	0	0	1	0	4	10
79	0	1	0	2	0	0	0	0	1	4
80	0	0	0	1	0	0	0	0	1	2
81	0	0	0	2	1	1	1	0	5	10
82	0	1	0	3	0	0	0	0	3	7
83	0	2	0	1	0	0	0	0	4	7
84	0	2	0	2	0	1	4	0	4	13
85	0	1	1	4	1	1	0	0	2	10
86	0	1	0	5	0	1	2	0	4	13
87	1	1	0	14	1	3	1	0	0	21
88	0	0	1	14	2	4	2	0	6	29
89	0	0	0	7	1	1	1	0	3	13
90	0	0	0	2	0	1	0	0	2	5
Total	1	15	3	108	8	21	18	1	56	231

A: Agriculture, M: Mining, C: Construction, M1: Manufacturing, W: Wholesale, R: Retail, S: Services, U: Unclassified, R1: Regulated

Note: Only targets of unsuccessful tender offers are considered in construction of sample of targets.

Table 11. Sample Selection Procedure (Target).

Reason for Elimination from the sample	Number of targets
First stage:	
Active target firms had tender offers between 1971-1990	231
Eliminated because of regulated firms	56
Eliminated because of unclassified industry targets	1
Remaining after target's identity screens	174
Second stage:	
Eliminated because firms had tender offers between 1971-1975.	42
Eliminated because firms involved in tender offers prior to being targets in the period of 1976-1990.	9
Remaining in the final sample	123

Table 12. Distribution of Targets who were Firstly Attempted by Bidders in the period of 1976-1990 by Year and Industry.

Year	A	M	C	MI	W	R	S	Total
76	0	0	0	4	1	1	1	7
77	0	1	0	10	1	4	3	19
78	0	0	0	5	0	0	1	6
79	0	0	0	2	0	0	0	2
80	0	0	0	0	0	0	0	0
81	0	0	0	2	1	1	1	5
82	0	0	0	4	0	0	0	4
83	0	1	0	0	0	0	0	1
84	0	3	0	2	0	0	5	10
85	0	1	1	4	1	1	0	8
86	0	1	0	5	0	1	2	9
87	1	0	0	13	1	3	1	19
88	0	0	1	14	2	4	2	23
89	0	0	0	6	1	1	1	9
90	0	0	0	0	0	1	0	1
Total	1	7	2	71	8	17	17	123

A: Agriculture, M: Mining, C: Construction, MI: Manufacturing, W: Wholesale, R: Retail, S: Services

Table 13. Distribution of Three Mutually Exclusive Events by Year After First Acquisition (Target).

Year after first acquisition	Targets attempting first acquisition	Targets being subject to acquisition attempt again	Targets maintaining the status quo	Total
1	0	1	0	1
2	0	0	0	0
3	0	0	0	0
4	2	1	0	3
5	0	3	116	119
Total	6	5	50	61

Note: The three mutually exclusive events are targets attempting first acquisition, being subject to acquisition attempt again or maintaining the status quo—occurring within five years of targets being firstly attempted in the period of 1976-1990.

Table 14. Bidders Abnormal Return Around the First Tender Offer Announcement Date.

Event Day	AAR (%)	Positive (%)	CAAR (%)
-5	-0.21*	44	-0.21
-4	-0.10	44	-0.31
-3	0.09	51	-0.21
-2	0.25**	48	0.04
-1	-0.34**	41	-0.30
0	-0.16	48	-0.46
+1	0.07	45	-0.38
+2	0.06	48	-0.32
+3	-0.09	49	-0.41
+4	-0.20	41	-0.61
+5	-0.07	44	-0.68

Note: Average Abnormal Return (AAR), Percentage of Positive Average Abnormal Returns, and Cumulative Average Abnormal Return (CAAR) for the 346 Bidders from Five Days before and Five Days after the Announcement (Day Zero) of the first Tender Offers in the period of 1976-1990.

* Significant at the 0.10 level.

** Significant at the 0.01 level.

Table 15. Bidders Abnormal Returns Around the Second Tender Offer Announcement Date.

	Second Tender Offer (N=127)			Being Bidders[a] (N=83)			Being Targets[b] (N=44)		
Event Day	AAR (%)	Positive (%)	CAAR (%)	AAR (%)	Positive (%)	CAAR (%)	AAR (%)	Positive (%)	CAAR (%)
-5	1.74	50	1.74	0.06	48	0.06	4.91	48	4.91
-4	1.68**	60	3.42	0.23	48	0.29	4.41**	80	9.32
-3	1.17**	60	4.59	0.31	57	0.60	2.80**	66	12.12
-2	1.27**	56	5.86	0.05	46	0.65	3.57**	75	15.70
-1	5.09**	54	10.95	-0.30**	42	0.35	15.27**	75	30.97**
0	4.24**	49	15.20*	-0.87**	37	-0.52	13.89**	70	44.85**

Note: Average Abnormal Return (AAR), Percentage of Positive Average Abnormal Returns, and Cumulative Average Abnormal Return (CAAR) for the bidders' second tender offers, bidders being bidders again and bidders being target at the second tender offers, respectively, from Five Days before to the Announcement (Day Zero) in the period of 1976-1990.

* Significant at the 0.1 level.

** Significant at the 0.01 level.

[a] Being bidders is bidders making an attempt in second tender offer.

[b] Being targets is bidders receiving an attempt in second tender offer.

Table 16. Comparison of the First and Second Tender Offer with the Characteristics of Tender Offer.

			Second Tender Offer						Mean Difference			
	(1)		(2)		(3)		(4)					
	First Tender Offer		All		Bidder		Target		(1)-(3)		(1)-(4)	
CAAR[-1,0]	-0.0100	N=346	0.0900	N=127	-0.0100	N=83	0.2900	N=44	0.0000	(0.00)	-0.3000	(-1.87)*
Premium	0.5239	N=343	0.6298	N=96	0.7758	N=47	0.4899	N=49	-0.2518	(-1.62)	0.0340	(0.22)
Success	0.4945	N=366	0.7490	N=151	0.5980	N=101	0.9000	N=50	-0.1035	(-0.92)	-0.4055	(-2.69)**
Hostile	0.2432	N=366	0.3875	N=151	0.2949	N=101	0.4800	N=50	-0.0517	(-0.46)	-0.2368	(-1.57)
Insider Ownership	0.3135	N=204	0.1121	N=98	0.1297	N=61	0.0945	N=37	0.0055	(0.03)	0.0407	(0.23)

Note: CAAR[-1,0] is the Cumulative Average Abnormal Return from day -1 to day 0 (the announcement date). Premium is the offer price relative to price 60 trading days prior to tender offer. Success is the percentage of the successful tender offer. Hostile is the percentage the hostile target management reaction to the offer. Insider Ownership is the percentage held by the Insider/Officer. Size is the natural log of market value of equity. Numbers in parentheses represent the Z-value for mean difference. Z-value = $\frac{\overline{Y} - \overline{X}}{\sqrt{\frac{1}{N_Y} + \frac{1}{N_X}}}$, where $\overline{Y}$, $\overline{X}$ represent the means of the characteristics to be compared, and the N_Y, N_X represent th numbers of the bidders in each group to be compared.

* Significant at the 0.10 level.

** Significant at the 0.01 level.

Table 17. Bidder and Matching Firms Returns Sorted by the Result of First Tender Offer and Three Mutually Exclusive Events After the First Tender Offer.

Subsequent Event	Statistic	Result of first Tender Offer		
		Success	Unsuccess	All
Bidder	1. Sample size	36	39	75
	2. Bidder return (%)	94.57	95.34	94.97
	3. Matching return (%)	77.30	56.17	66.31
	4. Difference 2-3 (%)	17.27 (0.59)	39.17 (1.36)	28.66 (1.40)
Target	1. Sample size	15	11	26
	2. Bidder return (%)	53.84	61.15	56.93
	3. Matching return (%)	48.02	32.47	41.44
	4. Difference 2-3 (%)	5.82 (0.27)	28.68 (0.42)	15.49 (0.50)
Bidder & Target (Activity)	1. Sample size	51	50	101
	2. Bidder return (%)	82.59	87.82	85.18
	3. Matching return (%)	68.69	50.95	59.91
	4. Difference 2-3 (%)	13.90 (0.64)	36.86 (1.38)	25.27 (1.48)
Status Quo	1. Sample size	105	104	209
	2. Bidder return (%)	114.39	80.27	97.42
	3. Matching return (%)	106.55	64.97	85.86
	4. Difference 2-3 (%)	7.84 (0.39)	15.30 (0.77)	11.55 (0.82)
All	1. Sample size	156	154	310
	2. Bidder return (%)	104.00	82.72	93.43
	3. Matching return (%)	94.17	60.42	77.41
	4. Difference 2-3 (%)	9.82 (0.64)	22.30 (1.40)	16.02 (1.45)

Note: The three mutually exclusive events are Bidding acquiring another firm (Bidder), bidder being subject to an acquisition attempt (Target), and bidder maintaining the status quo (Status Quo), 1976-1990. Starting on the day after the first tender offer ending date, a buy-and-hold return is calculated for both the bidders and its matching firm for up to five years after the first tender offer. For bidders having any tender offer prior to five years of the first tender offer, the return is calculated up to five days before the second tender offer announcement date. This is reported in lines 2 and 3, respectively. Line 4 reports the difference between average buy-and-hold returns over the entire five-year period for bidders and matching firms. Numbers in parentheses represent the t-statistics.

Table 18. Bidder and Market Returns Sorted by the Result of First Tender Offer and Three Mutually Exclusive Events After the First Tender Offer.

Subsequent Event	Statistic	Result of first Tender Offer		
		Success	Unsuccess	All
Bidder	1. Sample size	36	39	75
	2. Bidder return (%)	94.57	95.34	94.97
	3. Market return (%)	47.78	38.02	42.70
	4. Difference 2-3 (%)	46.79 (2.01)*	57.32 (1.84)*	52.27 (2.67)***
Target	1. Sample size	15	11	26
	2. Bidder return (%)	53.84	61.15	56.93
	3. Market return (%)	42.95	25.55	35.59
	4. Difference 2-3 (%)	10.88 (0.70)	35.60 (0.78)	15.49 (1.03)
Bidder & Target (Activity)	1. Sample size	51	50	101
	2. Bidder return (%)	82.59	87.82	85.18
	3. Market return (%)	46.36	35.27	40.87
	4. Difference 2-3 (%)	36.23 (2.12)**	52.54 (2.01)**	44.30 (2.86)***
Status Quo	1. Sample size	105	104	209
	2. Bidder return (%)	114.39	80.27	97.42
	3. Market return (%)	91.38	86.81	89.60
	4. Difference 2-3 (%)	23.01 (1.47)	-7.5 (-0.52)	7.81 (0.73)
All	1. Sample size	156	154	310
	2. Bidder return (%)	104.00	82.72	93.43
	3. Market return (%)	76.66	70.75	73.73
	4. Difference 2-3 (%)	27.33 (2.29)**	11.97 (0.91)	19.70 (2.22)**

Note: The three mutually exclusive events are Bidding acquiring another firm (Bidder), Bidder being subject to an acquisition attempt (Target), and Bidder maintaining the status quo (Status Quo), 1976-1990. Starting on the day after the first tender offer ending date, a buy-and-hold return is calculated for both the bidders and the market for up to five years after the first tender offer. For bidders having any tender offer prior to five years of the first tender offer, the return is calculated up to five days before the second tender offer announcement date. This is reported in lines 2 and 3, respectively. Line 4 reports the difference between average buy-and-hold returns over the entire five-year period for the bidders and the market. Numbers in parentheses represent the t-statistics.

* Significant at the level of 0.10.

** Significant at the level of 0.05.

*** Significant at the level of 0.01.

Table 19. Multinomial Logit Regressions Relating Likelihood of Three Mutually Exclusive Events to the Characteristics of Bidders' First Acquisitions and Bidders' Firms.

	(1)		(2)		(3)		(4)		(5)	
Variable	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)
	-0.4906	-1.1387	0.0001	-0.4336	-0.1559	-0.8166	-0.1840	-0.8126	-0.2971	-0.9363
Constant	(-1.6951)*	(-3.1972)***	(0.0004)	(-1.3017)	(-0.6198)	(-2.5448)**	(-0.8360)	(-2.9339)***	(-1.3832)	(-3.3611)***
	-1.0445	-1.4665	-1.1275	-1.4665	-1.0633	-1.4614	-1.0319	-1.4500	-1.0729	-1.4775
Policy	-0.3481	0.5510	-0.4153	-0.5930	-0.3980	-0.6108	-0.3752	-0.5964	-0.3879	-0.3116
	(-4.0333)***	(-4.3726)***	(-4.3699)***	(-4.1377)***	(-4.2268)**	(-4.1573)***	(-4.0204)**	(-4.2527)***	(-4.1810)**	(-4.4036)***
							-0.0010	0.0018		
YearAR							-0.00004	0.0001		
							(-0.2401)	(0.3573)		
	-1.0479	0.2435			-0.0689	0.0075				
Result	-0.5616	0.1219			-0.0275	0.0125				
	(-0.3680)	(0.6713)			(-0.2773)	(0.0240)				
	0.2511	0.2142	0.1431	0.1051						
React	0.3512	0.2616	0.0213	0.0120						
	(0.7631)	(0.4977)	(0.4864)	(0.2772)						
	-0.5416	-0.4886			-0.0047	-0.0052				
Premium	-1.1627	-1.1350			-0.0014	-0.0016				
	(-1.1191)	(-0.8202)			(-0.9766)	(-0.8411)				
	-0.6004	0.8055	0.0001	-0.0008						
Cashflow	-0.1128	0.6914	0.0300	-0.1944						
	(-0.6344)	(0.6136)	(0.3822)	(-0.8956)						
	0.5639	0.1273					0.0066	0.0130		
Lnsize	0.1308	0.5344					0.0187	0.0585		
	(0.7742)	(0.6136)					(1.1081)	(1.2641)		
									-0.2846	-0.3501
ROE									-0.0209	-0.0196
									(-1.5706)	(-1.7576)*
	-0.7274	-0.7631								
ROA	-0.2840	-0.3085								
	(-2.1775)**	(-2.2430)**								

Table 19 (continued)

	(1)		(2)		(3)		(4)		(5)	
Variable	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)
ASSET							-0.5306 -0.1609 (-2.0414)**	-0.5737 -0.1834 (-2.1014)**		
LEV					-0.3996 -0.1208 (-1.7543)*	-0.4611 -0.1529 (-1.8874)*				
DIV	0.7285 0.8836 (2.1904)**	0.7511 0.9649 (2.2193)**	0.2695 0.0381 (1.8150)*	0.3305 0.0576 (2.0965)**	0.4045 0.0572 (1.7723)*	0.4599 0.0749 (1.8801)*	0.5355 0.0688 (2.0549)**	0.5714 0.0793 (2.0883)**	0.2884 0.0410 (1.5942)	0.3476 0.0418 (1.7487)*
SALES			-0.2626 -0.1985 (-1.7859)*	-0.3273 -0.2849 (-2.0955)**						
5-25%			-0.4941 -0.1612 (-1.9660)**	0.6132 0.1560 (1.8959)*	-0.5228 -0.1688 (-2.1496)*	0.6318 0.1630 (1.9820)**	-0.5475 -0.1797 (-2.2285)**	0.6131 0.1644 (1.9791)**	-0.4855 -0.1611 (-1.9169)*	0.6594 0.2256 (2.0071)**
> 25%			0.4931 0.0690 (1.9627)**	-0.6105 -0.1517 (-1.8812)*	0.5221 0.0714 (2.1469)*	-0.6294 -0.1536 (-1.9687)**	0.5459 0.0768 (2.2235)**	-0.6123 -0.1589 (-1.9703)**	0.4846 0.0674 (1.9141)*	-0.6572 -0.0221 (-1.9943)**
LRT	49.4606***		53.9240***		53.7389***		57.9154***		51.5993***	

Note: The top number for each variable is the parameter estimate, the middle number is the elasticity, and t-values are in parentheses.

* Significant at the level of 0.10.

** Significant at the level of 0.05.

*** Significant at the level of 0.01.

Table 20. Multinomial Logit Regressions Relating Likelihood of Three Mutually Exclusive Events to the Characteristics of Bidders' First Acquisitions and Bidders' Firms.

	(1)		(2)		(3)		(4)	
Variable	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)
Constant	-0.3575 (-1.4973)	-1.0267 (-3.5175)***	-0.4153 (-2.0920)**	-1.1705 (-4.5579)***	-0.2614 (-1.2538)	-0.8191 (-3.1207)***	-0.3469 (-1.1588)	-0.9598 (-2.5819)***
Policy	-0.6168 -0.1966 (-1.9763)**	-1.0718 -0.4155 (-2.3912)**						
TAX	-0.7793 -0.1623 (-2.0480)**	-0.7079 -0.1436 (-1.2140)	-1.2184 -0.2713 (-3.8825)***	-1.4328 -0.3324 (-3.3814)***	-1.5177 -0.3422 (-4.6464)**	-1.7932 -0.2435 (-3.8376)***		
Y82-86					-0.6258 -0.8078 (-1.8991)*	-1.1604 -0.1074 (-2.5892)**		
Year80							-1.0401 -0.4192 (-4.0515)**	-1.4139 -0.6485 (-4.4532)***
YearAR			-0.1450 -0.5388 (-0.3447)	0.1175 0.8785 (0.2311)				
Result	-0.1676 -0.5460 (-0.6699)	-0.1048 -0.2247 (-0.3364)					0.3645 0.2209 (0.1316)	0.4991 0.2144 (0.1400)

Table 20 (continued)

	(1)		(2)		(3)		(4)	
Variable	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)	P(BIDDER)	P(TARGET)
	-0.5214	-0.4793					-0.4298	-0.3470
Premium	-0.1561	-0.1341					-0.1333	-0.9015
	(-1.0802)	(-0.8199)					(-0.8902)	(-0.5832)
	-0.7013	0.8490					-0.1034	0.6240
Cashflow	-0.1634	0.7475					-0.1692	0.5517
	(-0.7290)	(0.5817)					(-0.1101)	(0.4758)
	0.5738	0.1263	0.6658	0.1412			0.6791	0.1441
Lnsize	0.1351	0.5274	0.1746	0.6401			0.1647	0.5981
	(0.7804)	(1.3066)	(1.1166)	(1.5194)			(0.9398)	(1.4075)
	-0.6868	-0.7257					-0.7570	-0.7876
ROA	-0.2693	-0.2960					-0.2990	-0.3200
	(-2.1906)**	(-2.2138)**					(-2.2247)**	(-2.2109)**
			-0.4695	-0.5196				
ASSET			-0.1421	-0.1683				
			(-1.9454)*	(-2.0399)**				
	0.6881	0.7129	0.4739	0.5163			0.7594	0.7779
DIV	0.8283	0.9178	0.6071	0.7322			0.9273	0.9940
	(2.2047)**	(2.1844)**	(1.9589)*	(2.0224)**			(2.2410)**	(2.1939)**
			-0.5967	0.5793	-0.5528	0.5942		
5-25%			-0.1903	0.1584	-0.1740	0.2251		
			(-2.4427)**	(1.8560)*	(-2.1666)**	(1.7911)*		
			0.5945	-0.5795	0.5527	-0.5925		
> 25%			0.8267	-0.1562	0.7671	-0.2307		
			(2.4351)**	(-1.8496)*	(2.1667)**	(-1.7803)*		
LRT	53.3615***		53.8802***		49.9438***		48.6541***	

Note: The top number for each variable is the parameter estimate, the middle number is the elasticity, and t-values are in parentheses.

* Significant at the level of 0.10.

** Significant at the level of 0.05.

*** Significant at the level of 0.01.

Table 21. Distribution of First and Second Acquisition Attempts by 1970 and 1980's.

	1976-1979	1980-1990
First Acquisition Attempt	146	220
Second Acquisition Attempt	40	42

Table 22. Estimated Coefficients from Full Set Events and Subset Events.

	Multinomial Estimation (Full Set Events)			Binary Estimation (Subset Events)		
Variable name	Coefficient estimate	Standard Error	t-statistic	Coefficient estimate	Standard Error	t-statistic
P(BIDDER):[c]						
Constant	0.04719	0.2642	0.1786	-1.3503	0.7105	-1.9005
Policy	-1.1240	0.2580	-4.3566	-0.7478	0.3828	-1.9535
React	0.1379	0.2898	0.4760	0.0302	0.4567	0.0661
Cashflow	0.0048	0.0065	0.7375	0.0754	0.0514	1.4676
DIV	0.2766	0.1428	1.9365	2.8527	0.9554	2.9859
SALES	-0.2739	0.1417	-1.9327	-0.1814	0.3631	-0.4995
5-25%	-0.5027	0.2488	-2.0200	-0.3390	0.4828	-0.7021
>25%	0.5017	0.2788	2.0165	1.2171	0.5011	2.4289
P(TARGET):[d]						
Constant	-0.4896	0.3218	-1.5215	-0.4160	0.8697	-0.4783
Policy	-1.5576	0.3434	-4.5356	-2.0840	0.6090	-3.4222
React	0.1519	0.3794	0.4004	-0.1494	0.6263	-0.2386
Cashflow	0.0144	0.0104	1.3835	-0.0740	0.3636	-0.2035
DIV	0.3301	0.1646	2.0057	0.9955	0.7903	1.2597
SALES	-0.3424	0.1645	-2.0813	-0.5256	0.5151	-1.0203
5-25%	0.6244	0.3232	1.9320	0.5876	0.5312	1.1061
>25%	-0.6223	0.3242	-1.9197	-0.9303	1.1389	-0.8168
Summary statistics:						
Number of Observations	180			149[a]	124[b]	
Likelihood function	54.55			-84.27[a]	-50.49[b]	

[a] These numbers are the number of observations and likelihood function for BIDDER.
[b] These numbers are the number of observations and likelihood function for TARGET.
[c] This is the BIDDER vs. NA events in the Binary estimation.
[d] This is the TARGET vs. NA events in the Binary estimation.

Table 23. Asymptotic Covariance Matrix of Estimated Coefficients of Full Set Events.

P(BIDDER):								
Constant	0.0698							
POLICY	-0.0324	0.0666						
REACT	-0.0184	-0.0063	0.0840					
CASHFLOW	0.0002	-0.0001	0.0001	0.0000				
DIV	0.0214	-0.0015	-0.0026	0.0000	0.0204			
SALES	-0.0213	0.0016	0.0025	-0.0001	-0.0202	0.0201		
5-25%	-0.0026	0.0017	0.0088	-0.0001	-0.0006	0.0006	0.0619	
>25%	0.0029	-0.0017	-0.0088	0.0001	0.0006	-0.0006	-0.0619	0.0619
	Constant	POLICY	REACT	CASHFLOW	DIV	SALES	5-25%	>25%
P(TARGET):								
Constant	0.1036							
POLICY	-0.0467	0.1179						
REACT	-0.0326	-0.0119	0.1440					
CASHFLOW	0.0005	-0.0004	-0.0003	0.0001				
DIV	0.0261	-0.0031	0.0001	0.0002	0.0271			
SALES	-0.0262	0.0035	0.0002	-0.0003	-0.0270	0.0271		
5-25%	-0.0326	0.0018	0.0063	0.0001	0.0012	-0.0014	0.1045	
>25%	0.0331	-0.0019	-0.0063	-0.0001	-0.0012	0.0014	-0.1048	0.1051
	Constant	POLICY	REACT	CASHFLOW	DIV	SALES	5-25%	>25%

Table 24. Asymptotic Covariance Matrix of Estimated Coefficients of Subset Events.

P(BIDDER):								
Constant	0.5048							
POLICY	-0.0541	0.1465						
REACT	-0.0872	-0.0110	0.2085					
CASHFLOW	-0.0025	-0.0025	-0.0020	0.0026				
DIV	-0.3702	-0.0152	0.0584	0.0038	0.9127			
SALES	-0.1810	-0.0037	0.0240	0.0007	-0.0012	0.1319		
5-25%	-0.0817	-0.0033	-0.0052	-0.0017	0.0311	0.0029	0.2331	
>25%	-0.1242	-0.0237	-0.0320	0.0028	0.1862	-0.0030	0.0764	0.2511
	Constant	POLICY	REACT	CASHFLOW	DIV	SALES	5-25%	>25%
P(TARGET):								
Constant	0.7563							
POLICY	-0.0517	0.3708						
REACT	-0.1675	-0.0022	0.3923					
CASHFLOW	-0.0419	-0.0170	0.0054	0.1322				
DIV	-0.3118	-0.0708	0.0793	0.0185	0.6246			
SALES	-0.3629	0.0090	0.0519	0.0048	0.0368	0.2654		
5-25%	-0.1218	-0.0250	-0.0246	0.0119	0.0831	-0.0192	0.2822	
>25%	-0.2218	-0.0620	-0.0094	0.0244	0.1499	0.0393	0.1408	1.2972
	Constant	POLICY	REACT	CASHFLOW	DIV	SALES	5-25%	>25%

Table 25. Scalar, α, for Bidder and Target.

P(BIDDER):								
Constant	7							
POLICY	2	2						
REACT	5	2	2					
CASHFLOW	-13	25	-28	63				
DIV	-17	10	-23	108	45			
SALES	8	-2	10	-10	0	7		
5-25%	31	-2	-1	30	-54	5	4	
>25%	-43	14	4	49	330	5	-1	4
	Constant	POLICY	REACT	CASHFLOW	DIV	SALES	5-25%	>25%
P(TARGET):								
Constant	7							
POLICY	1	3						
REACT	5	0	3					
CASHFLOW	-84	42	-20	1228				
DIV	-12	23	713	96	23			
SALES	14	3	312	-16	-1	10		
5-25%	4	-14	-4	85	67	14	3	
>25%	7	32	1	-172	-121	28	-1	12
	Constant	POLICY	REACT	CASHFLOW	DIV	SALES	5-25%	>25%

Note: Scalar is: $\frac{\sigma_{S,t,j}}{\sigma_{F,t,j}}$, see Equation 25 for detail.

Table 26. Correct Approximate Likelihood Ratio Test.

Estimation	Full set	Subset (b)	Subset (t)	n	LRT (b)[a]	LRT (t)[a]	LRT (b)[b]	LRT (t)[b]
1	-319.13	-78.571	-43.047	264	483.646	552.377	166.1105	142.2898
2	-316.59	-84.266	-50.493	180	468.237	532.194	167.8514	154.0009
3	-316.99	-83.719	-44.733	174	470.271	544.514	167.8352	144.3567
4	-314.91	-76.379	-46.812	172	480.920	536.196	161.6722	146.9476
5	-318.06	-90.610	-52.234	185	458.318	531.652	172.0232	157.5764
n		149	124					

[a] LRT (b) and LRT (t) are the Corrected Approximate Likelihood Ratio Test for P(BIDDER) and P(TARGET) with the maximum Scalar 108 and 1228, respectively.
[b] LRT (b) and LRT (t) are the Corrected Approximate Likelihood Ratio Test for P(BIDDER) and P(TARGET) with the Scalar 1, respectively.

Table 27. Logit Regressions Relating Likelihood of Bidders' Involvement in Acquisition Activity to the Characteristics of Their First Acquisitions and Their Firms.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.9176 (-0.8330)	0.0718 (0.1018)	0.1160 (0.2285)	-0.2150 (-0.5040)	-0.3423 (-0.6508)	-0.7530 (-0.8946)
Policy	-1.1248 -0.3742 (-3.0325)***	-1.2768 -0.3478 (-4.5016)***	-1.3256 -0.3713 (-4.7950)***	-1.0800 -0.3613 (-3.2014)***	-1.2911 -0.3627 (-4.6864)**	-1.3430 -0.4541 (-3.7196)***
YearAR	0.6044 0.0205 (1.7488)*			0.6416 0.2191 (1.9053)*		
Result						0.2802 0.0927 (0.8137)
React	-0.1089 -0.0159 (-0.2512)					
Premium		-0.9201 -0.2719 (-2.1729)**	-0.8636 -0.2606 (2.1058)**		-0.8461 -0.2561 (-2.0551)**	-0.6959 -0.2353 (-1.3465)
Cashflow				-0.2561 -0.4654 (-0.5527)		
Lnsize	-0.0295 -0.1156 (-0.2289)	-0.0120 -0.0385 (-0.1431)				
ROE					0.1509 0.1021 (0.2720)	
ROA			-2.0592 -0.0826 (-0.7302)	-1.4668 -0.6354 (-0.4211)		
ASSET		0.5428 0.1674 (0.7117)	0.6991 0.2210 (0.9424)		0.5650 0.1791 (0.7418)	
LEV	0.9570 0.3130 (0.7596)					1.1343 0.3742 (0.9033)

Table 27 Continued

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	1.8695	1.4661	1.1166	1.4615	1.1019	1.3660
DIV	0.3468	0.2993	0.2351	0.2726	0.2327	0.2627
	(2.2413)**	(2.6770)***	(2.5490)**	(2.0323)**	(2.5829)**	(2.0973)**
					0.2638	
SALES					0.2089	
					(0.1215)	
	0.0160			-0.1615		0.0957
5-25%	0.0030			-0.3028		0.0174
	(0.0389)			(-0.4353)		(0.2403)
	0.5293					0.6067
> 25%	0.0677					0.0750
	(1.0634)					(1.2938)
LRT	25.63***	40.82***	40.17***	24.62***	39.75***	24.44***

Note: The top number for each variable is the parameter estimate, the middle number is the elasticity, and t-values are in parentheses.

* Significant at the level of 0.10.

** Significant at the level of 0.05.

*** Significant at the level of 0.01.

Table 28. Cox Model Estimation—Data Set Two Years Prior to Second Tender Offer.

Variable	(1)	(2)	(3)	(4)	(5)
		-0.5815*	-0.5722*	-0.5699*	
Policy		0.5591	0.5643	0.5656	
		(0.0631)	(0.0851)	(0.0672)	
	0.6500*				
YearAR	1.9156				
	(0.0843)				
		0.1396	0.1224		
Result		1.1498	1.1303		
		(0.6850)	(0.7392)		
		0.7162*	0.7815**	0.6174*	
React		2.0466	2.1848	1.8541	
		(0.0509)	(0.0432)	(0.0527)	
			0.2935		
Premium			1.3411		
			(0.4754)		
	0.0282***	0.0258***		0.0209**	0.0258***
Cashflow	1.0286	1.0261		1.0211	1.0261
	(0.0006)	(0.0076)		(0.0156)	(0.0085)
		0.0399	0.0508		0.0158
Lnsize		1.0408	1.0521		1.0160
		(0.6565)	(0.5820)		(0.8808)
				0.1550	
ROE				1.1677	
				(0.7501)	
					2.9835
ROA					19.7571
					(0.4147)
	-2.8514***	-1.8179**	-1.6435**		-2.3476***
ASSET	0.0578	0.1624	0.1933		0.0956
	(0.0010)	(0.0174)	(0.0417)		(0.0045)
	-3.9714***	-0.7051*	-0.6590*		-2.3216**
LEV	0.0188	0.4940	0.5174		0.0981
	(0.0006)	(0.0758)	(0.0947)		(0.0355)
					0.2206**
DIV					1.2469
					(0.0197)
				-0.1081	
SALES				0.8975	
				(0.6578)	
Overall χ^2	33.533***	19.921***	13.638*	12.728**	22.375***
D.F.	4	7	7	5	6
p-value	0.0000	0.0057	0.0580	0.0261	0.0010

Note: The top number for each variable is the parameter, and the middle number is Exp(Coefficient), and p-values are in parentheses.

* Significant at the level of 0.1.

** Significant at the level of 0.05.

***Significant at the level of 0.01.

Table29. Cox Model Estimation—Data Set Five Years Prior to Second Tender Offer.

Variable	(1)	(2)	(3)	(4)	(5)
	-0.4315*	-0.4451*	-0.5241**	-0.4492*	-0.4421*
Policy	0.6495	0.6407	0.5921	0.6382	0.6427
	(0.0772)	(0.0683)	(0.0379)	(0.0997)	(0.0758)
	0.2594	0.3046	0.3664	0.1440	0.1600
YearAR	1.2962	1.3561	1.4425	1.1548	1.1735
	(0.3489)	(0.2746)	(0.1902)	(0.6626)	(0.5708)
			0.3898	0.2779	0.3416
Result			1.4767	1.3204	1.4072
			(0.1172)	(0.3386)	(0.1681)
				-0.2498	
React				0.7789	
				(0.5258)	
			-0.3524		
Premium			0.7030		
			(0.3052)		
	0.0239***	0.0242***		0.0273***	
Cashflow	1.0241	1.0245		1.0277	
	(0.0064)	(0.0058)		(0.0037)	
					-0.1138
Lnsize					0.8924
					(0.1084)
				-0.2762*	-0.3097**
ROE				0.7587	0.7336
				(0.0552)	(0.0313)
	-7.1477***	-6.1228**			
ROA	0.0001	0.0022			
	(0.0041)	(0.0167)			
					-1.6030**
ASSET					0.2013
					(0.0191)
	-1.8538**	-1.5399*			-1.4766*
LEV	0.1566	0.2144			0.2284
	(0.0283)	(0.0628)			(0.0700)
				0.2264***	
DIV				1.2540	
				(0.0011)	
		-0.4382*	-0.5837**	-0.6655***	
SALES		0.6452	0.5578	0.5140	
		(0.0636)	(0.0140)	(0.0016)	
Overall χ^2	20.543***	23.999***	14.132**	29.783***	14.832**
D.F.	5	6	5	8	7
p-value	0.0010	0.0005	0.0148	0.0002	0.0382

Note: The top number for each variable is the parameter estimate, the middle number is Exp(Coefficient), and p-values are in parentheses.

* Significant at the level of 0.1.

** Significant at the level of 0.05.

***Significant at the level of 0.01.

Table 30. Summary of the Results Obtained from the Binary Logit, the Cox Model in Two-Year Data Set and in Five-Year Data Set.

Hypothesized Motivations	Variable(s)	Sign		
		Binary Logit	Cox (2 years)	Cox (5 years)
Operating Efficiency	Return on Asset (ROA)	-	+	-*
	Turnover Ratio (ASSET)	+	-*	-*
Management Performance	Annualized Buy-and-Hold Abnormal Return (YearAR)	+*	+*	+
	Return on Equity (ROE)	+	+	-*
	Activity Efficiency (SALES)	+	-	-*
Free Cash Flow	Cash flow(CASHFLOW)	+	+*	+*
	Dividend payout ratio(DIV)	+*	+*	+*
	PREMIUM	-*	-	+
Capital Structure	Level of Leverage (LEV)	+	-*	-*
Insider Ownership	5-25%	+		
	>25%	+		
Firm size	LNSIZE	-	-	+
Hubris Hypothesis	RESULT	+	+	+
	REACT	-	+*	-
Antitrust Policy	POLICY	-*	-*	-*

Note: The expected sign for each variable is summarized in Table 2.
* Variables are significant.

Figure 1

Log Minus Log Function[a]
Two Years prior to Second Acquisition Data

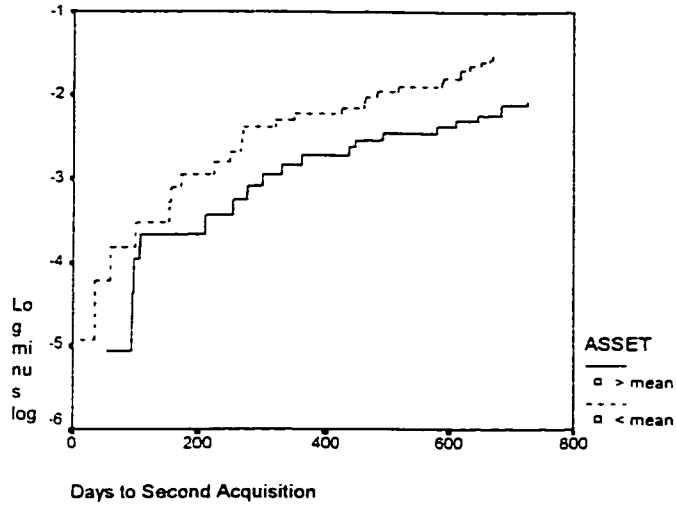
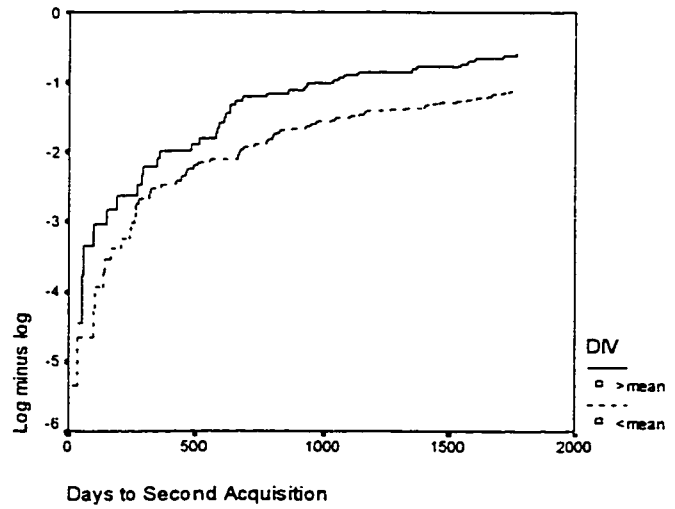


Figure 2

Log Minus Log Function[a]
Five Years prior to Second Acquisition Data



[a] Log minus Log function is used to test the proportional hazards assumption. The assumption is supported by data if the log-minus-log function produce parallel or near parallel lines.

Figure 3

Goodness of Fit[a]
Two Years prior to Second Acquisition Data (Estimation 1)

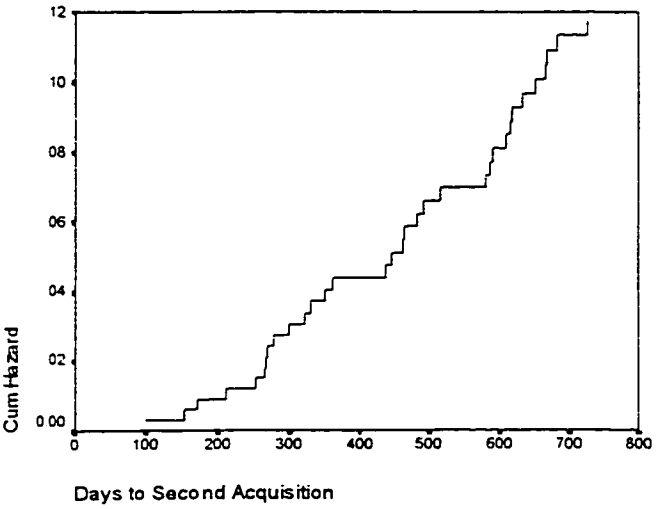
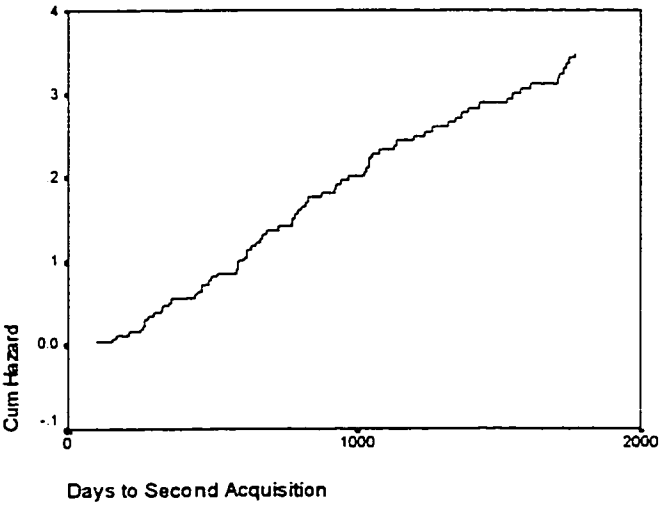


Figure 4

Goodness of Fit[a]
Five Years prior to Second Acquisition Data (Estimation 1)



[a] The goodness of fit plot is used to test if the Cox model fits the data well. The model fits the data well if the cumulative hazard versus time yield a straight line.

APPENDIX I

Bidder Returns Sorted by the Result of first Tender Offer and Three Mutually Exclusive Events. Horizon starts on the month after the first tender offer ending date to the month the second tender offer announced.

Subsequent Event	Statistic	Result of first Tender Offer		
		Success	Unsuccess	All
Bidder	1. Sample size	37	39	76
	2. Bidder return (%)	91.93	97.88	94.98
	3. Matching return (%)	87.37	54.66	70.59
	4. Difference 2-3 (%)	0.55 (0.14)	43.22 (1.53)	24.40 (1.12)
Target	1. Sample size	15	11	26
	2. Bidder return (%)	94.33	99.18	96.38
	3. Matching return (%)	46.87	16.10	33.85
	4. Difference 2-3 (%)	47.47 (2.39)**	83.09 (1.23)	62.54 (2.07)**
Bidder & Target (Activity)	1. Sample size	52	50	102
	2. Bidder return (%)	92.62	98.16	95.34
	3. Matching return (%)	75.69	46.17	61.22
	4. Difference 2-3 (%)	16.93 (0.69)	51.99 (1.97)**	34.12 (1.90)*
Status Quo	1. Sample size	105	104	209
	2. Bidder return (%)	110.30	79.32	94.88
	3. Matching return (%)	104.47	76.46	90.53
	4. Difference 2-3 (%)	5.83 (0.31)	2.86 (0.21)	4.35 (0.37)
All	1. Sample size	157	154	311
	2. Bidder return (%)	94.94	85.50	95.03
	3. Matching return (%)	9.50	66.55	80.92
	4. Difference 2-3 (%)	76.53 (22.27)***	18.95 (1.49)	14.11 (1.43)

Note: The three mutually exclusive events are bidders acquiring another firm (Bidder), bidders being subject to an acquisition attempt (Target), and bidders maintaining the status quo (Status Quo), 1976-1990. Starting on the month after the first tender offer ending date, a buy-and-hold return is calculated for both the bidders and its matching firm, and also the market for up to five years after the first tender offer. For bidders having any tender offer prior to five years of the first tender offer, the return is calculated up to the month the second tender offer announced. This is reported in lines 2, and 3, respectively. Line 4 reports the difference between average buy-and-hold returns over the entire five-year period for bidders and matching firms. Numbers in parentheses represent the t-statistics.

* Significant at the level of 0.10.

** Significant at the level of 0.05.

***Significant at the level of 0.01.

APPENDIX II

Bidder Returns Sorted by the Result of First Tender Offer and Three Mutually Exclusive Events. Horizon starts on the month after the first tender offer ending date to the month before the second tender offer announcement date.

Subsequent Event	Statistic	Result of first Tender Offer		
		Success	Unsuccess	All
Bidder	1. Sample size	37	39	76
	2. Bidder return (%)	91.55	94.58	92.97
	3. Matching return (%)	83.62	51.95	66.91
	4. Difference 2-3 (%)	7.93 (0.27)	42.63 (1.44)	26.06 (1.26)
Target	1. Sample size	15	11	26
	2. Bidder return (%)	55.42	67.48	60.52
	3. Matching return (%)	48.36	16.61	34.92
	4. Difference 2-3 (%)	7.06 (0.27)	50.87 (0.84)	25.60 (0.87)
Bidder & Target (Activity)	1. Sample size	52	50	102
	2. Bidder return (%)	81.13	88.40	84.69
	3. Matching return (%)	73.45	43.47	58.75
	4. Difference 2-3 (%)	7.68 (0.35)	44.93 (1.71)*	25.94 (1.52)
Status Quo	1. Sample size	105	104	209
	2. Bidder return (%)	108.91	80.56	95.36
	3. Matching return (%)	101.52	80.05	90.66
	4. Difference 2-3 (%)	7.39 (0.39)	0.51 (0.04)	4.70 (0.40)
All	1. Sample size	157	154	311
	2. Bidder return (%)	100.45	83.11	91.86
	3. Matching return (%)	91.99	68.17	80.20
	4. Difference 2-3 (%)	8.46 (0.58)	14.93 (1.18)	11.66 (1.21)

Note: The three mutually exclusive events are bidders acquiring another firm (Bidder), bidders being subject to an acquisition attempt (Target), and bidders maintaining the status quo (Status Quo), 1976-1990.

Starting on the month after the first tender offer ending date, a buy-and-hold return is calculated for both the bidders and its matching firm, and also the market for up to five years after the first tender offer. For bidders having any tender offer prior to five years of the first tender offer, the return is calculated up to the month before the second tender offer announcement date. This is reported in lines 2 and 3, respectively. Line 4 reports the difference between average buy-and-hold returns over the entire five-year period for bidders and matching firms. Numbers in parentheses represent the t-statistics.

* Significant at the level of 0.1.

APPENDIX III

Figure 1
Log Minus Log Function[a]
Two Years prior to Second Acquisition Data

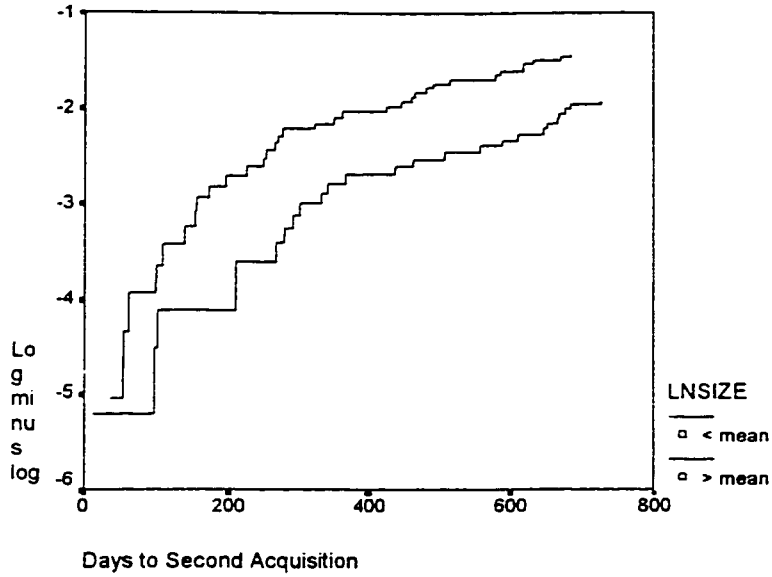


Figure 2
Log Minus Log Function[a]
Two Years prior to Second Acquisition Data

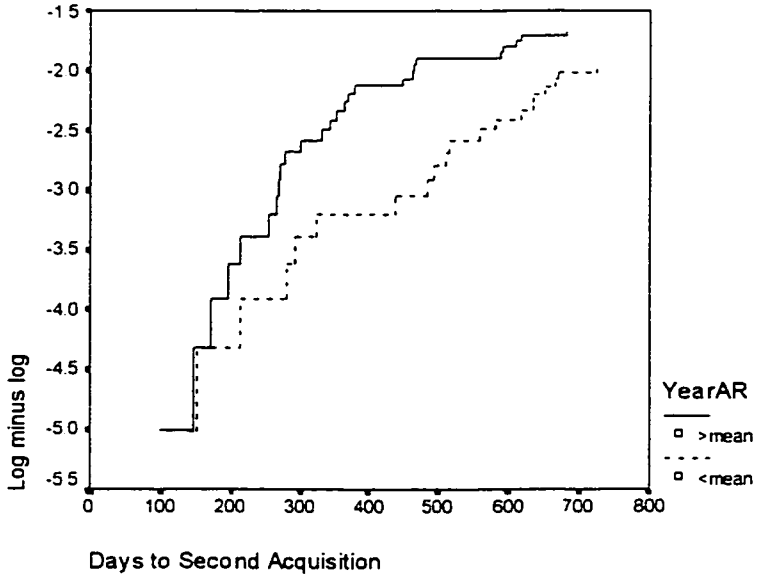


Figure 3
Log Minus Log Function[a]
Five Years prior to Second Acquisition Data

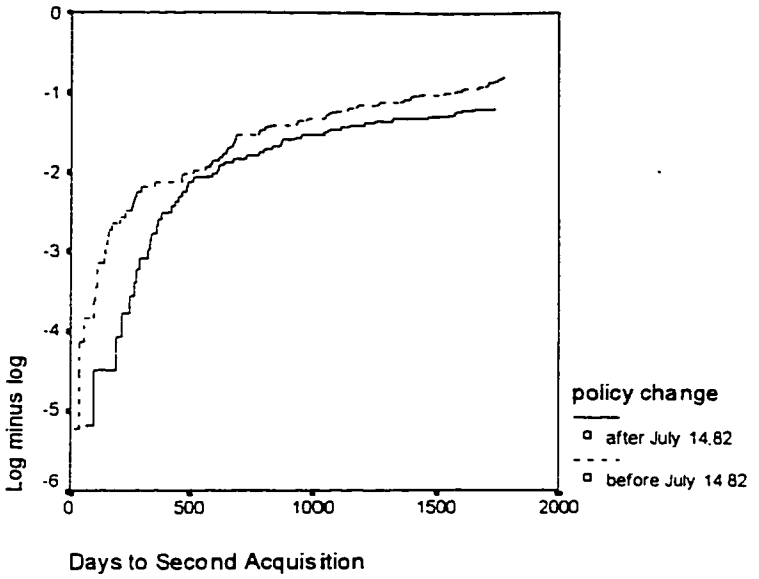
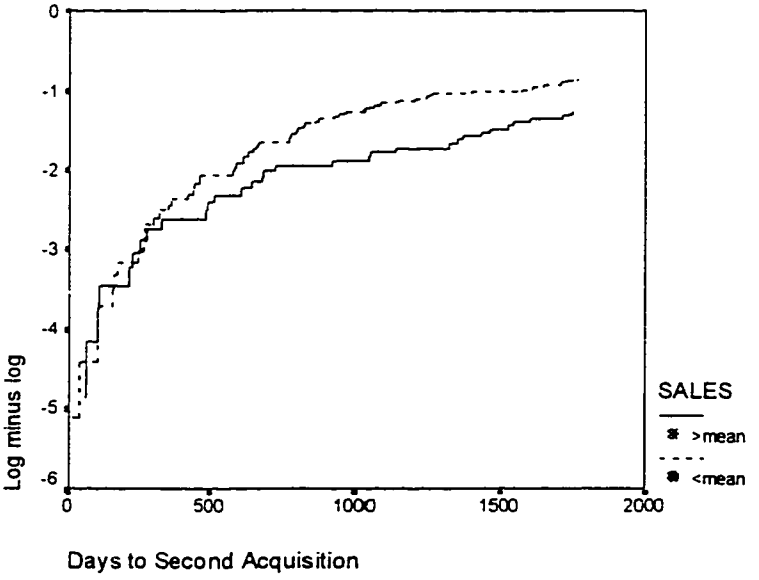


Figure 4
Log Minus Log Function[a]
Five Years prior to Second Acquisition Data



APPENDIX IV

Figure 1
Goodness of Fit[a]
Two Years prior to Second Acquisition Data (Estimation 2)

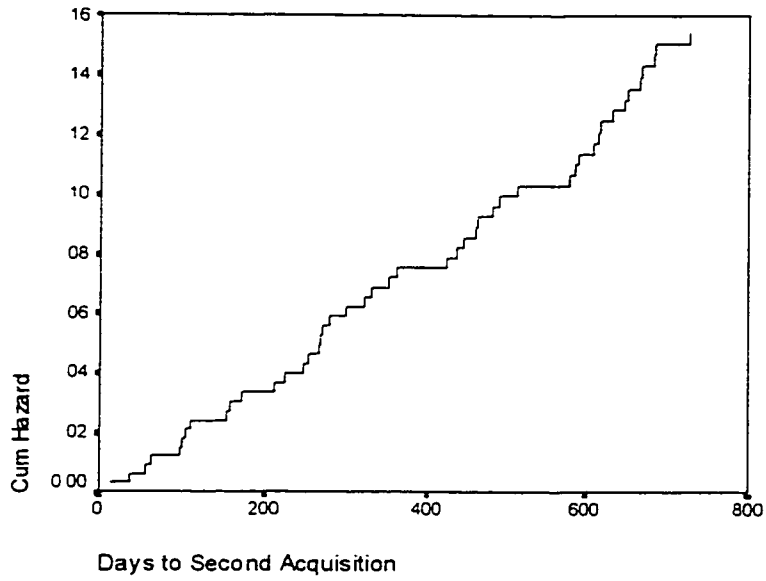


Figure 2
Goodness of Fit[a]
Two Years prior to Second Acquisition Data (Estimation 3)

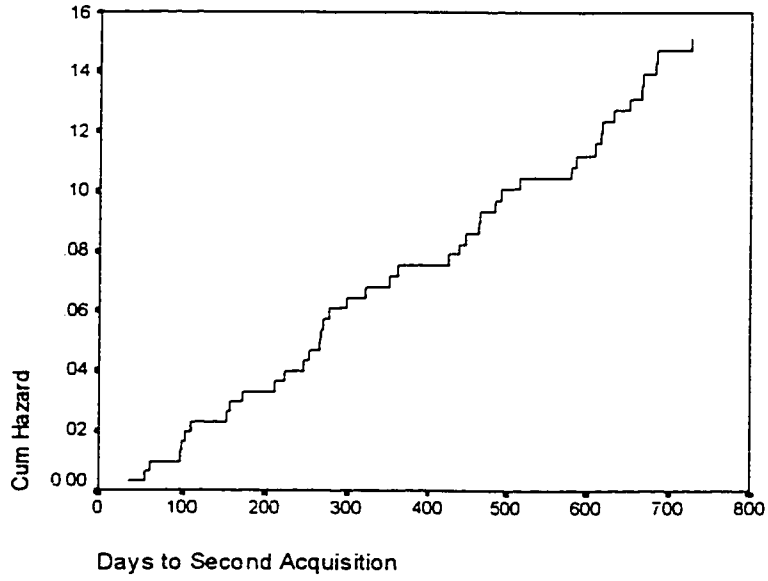


Figure 3
Goodness of Fit[a]
Five Years prior to Second Acquisition Data (Estimation 2)

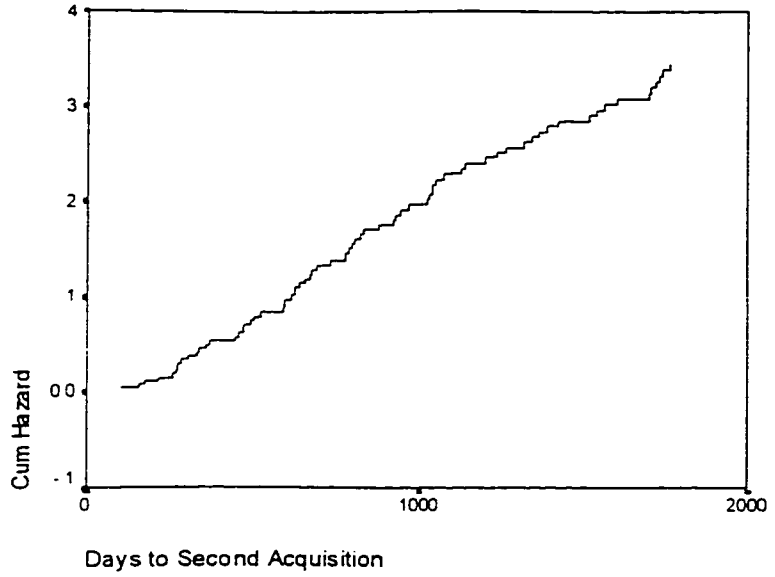


Figure 4
Goodness of Fit[a]
Five Years prior to Second Acquisition Data (Estimation 3)