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SHORT AND LONG TERM PERFORMANCE OF CANADIAN TSE-LISTED ACQUIRERS

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In
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ABSTRACT

Short and Long Term Performance of Canadian TSE-Listed Acquirers.

Roxanne Williams

Using 771 acquisitions during 1988-1998, this study empirically tests short- and long-term security price performance of Canadian TSE-listed acquirers. The cumulative abnormal return (CAR) and the buy-and-hold abnormal return (BHAR) methods were use for the short- and the long-term studies respectively. In the short-run study, using the dummy variable method, we test three event windows: (-4; 0), (-1, 0) and (0; 4) with an estimation period of 180 days. Non-significant abnormal returns were found in all cases. For the long-run analysis, different approaches for developing a benchmark portfolio are presented. We compare and empirically test two control firms approaches in the spirit of Barber and Lyon (1997) and Longhran and Vigh (1997) over a one year pre-announcement period and three year post-announcement period. The results are not robust to alternative estimation procedures.

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1. Introduction

Several questions have been raised about the potential benefits of corporate acquisitions. Many researchers have addressed the question of wealth gains from acquisitions and the findings are still mixed. It is widely recognised in the literature that shareholders of target firms realise large capital gains from corporate takeovers. The competitive market theory implies that competition surrounding corporate control limits managerial wealth divergence from shareholder wealth maximisation. As reported by Jensen and Ruback (1983), the takeover market or the market for corporate control has to be viewed as a market in which alternative managerial teams compete for the rights to manage corporate resources. Following this theory, corporate takeovers should be beneficial to shareholders of both firms involved in the transactions. However, as reported in the literature, the evidence on the bidders' gains following a corporate event is still mixed and gains to bidders are generally lower the greater the degree of competition for the target. The purpose of our study is to investigate if stockholders of Canadian acquirers do benefit from corporate acquisitions.

Since most of the studies performed in this arena are based on the U.S. market, our study brings a new insight by presenting evidence on the performance of Canadian TSE-listed bidder firms acquiring Canadian targets. It is important to note that this thesis does not focus on the empirical power of the statistical tests used in the measurement of abnormal returns. Although most of the measurement bias is reported, the goal of this study is to examine the

performance of Canadian bidders following a takeover event by partially replicating the methodology of prior studies.

Using different approaches, we test the overall wealth gains by investigating the pre- and post-acquisition returns of takeovers. The abnormal returns surrounding the announcement date have been tested using a traditional short-term event study framework based on Karafiath's (1988) approach. The pre- and post-acquisition abnormal returns have been tested using a long-run analysis that partially replicates Barber and Lyon (1997) and Loughran and Vijh (1997) methodologies.

The remainder of this thesis is organised as follows. In section 2, we present recent empirical studies on mergers and acquisitions in Canada. We then present in section 3 the relevant literature on short- and long-term stock price performance. In section 4, we review the various methodologies we have used in the measurement of short and long-term returns. Section 5 outlines the data collection process and presents the results. We close this thesis in Section 6 and 7 with discussion, conclusion and direction for future research.

2. The Canadian Perspective

The Canadian market for mergers and acquisitions has grown substantially over the past decade. Canadian companies have carried out mergers and acquisitions totalling $226-billion in 2000 compared to $105-billion in 1999 as reported by Crosbie & Co. Inc. More than 1297 transactions have taken place in Canada during the year of 2000 including 464 deals in the Industrial Products group and 149 in the Oil and Gas group. Although the Canadian market is a great arena for mergers and acquisitions, only a few recent studies have been done so far on the performance of Canadian bidders.

Eckbo and Thorburn (2000) brought a new insight by presenting evidence on the performance of Canadian and foreign bidder firms acquiring Canadian targets from January 1964 to December 1982. As a general conclusion, the results indicate that domestic bidders show superior earnings performance as well as superior stock price performance relative to foreign bidders in Canada. Because of the salient difference of the two acquirer groups (domestic and foreign), we have to conclude that the Canadian and the U.S markets have to be considered as two distinctive arena of research.

As documented by Eckbo and Thorburn (2000), Canadian bidders earn significant positive average abnormal returns for the announcement period and superior accounting performance for the pre-and post-acquisition period. However, the study shows evidence of declining average bidder firm performance during the 2 to 5 year period following merger announcements. These findings are robust with

respect to alternative estimation procedures. Since our study focus only on the Canadian bidders side, we will point-out, in the following paragraphs, the most relevant facts of Eckbo and Thorburn's (2000) study related to domestic bidders. For simplicity, we avoid discussing the details of the abnormal return estimation technique.

As documented in studies of long-run abnormal returns, stock price performance is sensitive to the medium of exchange in takeovers. Indeed, Eckbo, Giammarino, and Heinkel (1990) present evidence that bidder gains in Canada are greatest when the bidder offers a mix of cash and stock while Eckbo and Thorburn (2000) show that the market tends to react positively when the payment is in the form of bidder shares.

In addition to the medium of exchange, Eckbo and Thorburn (2000) show that Canadian bidder announcement returns are, on average, greatest for the bidders with the smallest equity size relative to the target. Also, they show that the smallest Canadian bidders have the greatest average announcement returns. As reported by Asquith, Bruner and Mullins (1983), when the target firm is small relative to the bidder, the power of the event-study methodology to register a gain from the acquisition is also relatively weak. Jarrell and Poulsen (1989) report that bidder abnormal returns tend to increase with the relative size of the target. Loderer and Martin (1990) find evidence of significantly positive acquiring firm returns only in the smallest size category. Those results might explain why U.S. bidders have insignificant abnormal returns and Canadian significant ones. In

fact, the U.S. bidder is, in average, eight times the size of the average Canadian bidder and the targets' size is approximately the same for both groups of bidders. As shown in Eckbo and Thorborn (2000), TSE-listed bidders show a tendency for bidder abnormal returns to decrease with increasing bidder size and the most profitable domestic acquisitions are the ones where the bidders and targets have similar total equity sizes.

Although this thesis studies only the performance of the Canadian bidders, a recent Canadian study by Jabbour, Jalivand and Switzer (2000) is presented in the following paragraphs. This study analyses the relationship between pre-bid price run-ups in target shares and the incidence of insider trading by analysing insiders' daily transactions for a sample of 128 Canadian acquisitions from 1985-1995. In this study, the use of Canadian data is appropriate because regulations are more stringent in the United States.

The observed pre-bid price run-ups in target share prices can be explained by two hypotheses. The first hypothesis, the market anticipation, specifies that price run-ups reflect investors anticipation of an impending takeover bid and occur as investors react to official reports of previous insider trades. The second hypothesis, the insider trading information, suggests that price run-ups are driven by the trading activities of corporate insiders before the takeover announcement becomes public knowledge. Abnormal stock price performance at an early stage before the acquisition announcement is due to actual trading by corporate insiders.

Using a standard event-study methodology to measure the abnormal returns to target shareholders, Jabbour et al. find significantly positive cumulative average abnormal returns of 12.28% over a two-month period up to and including the acquisition announcement date. Those results are consistent with the literature since abnormal returns to target shareholders ranging from 17.2 to 32.35% have been reported. Also, in accordance with the insider trading information hypothesis, the results establish a statistically significant link between insider trading activity and abnormal returns for the target firm's shares as early as 45 days before the actual acquisition announcement. In Canada, Amoako-Adu and Yagil (1986), Calvet and Lefoll (1987), and Masse et al. (1988) all report significantly positive pre-bid price run-ups as early as three months before the actual announcement date. Those results are very interesting and it would be relevant to test if the same conclusion might be applied to the bidder firms.

3. Literature Review and Related Methodologies

The study of the abnormal stock returns of the Canadian acquiring companies is divided into two parts. In the first part, we investigate the short term market effect of the acquisition on the acquirers' stocks using a traditional event study framework. The long term stock market abnormal returns are examined in the second part using the two control firm approaches and by investigating both pre- and post announcement excess returns.

3.1 Short-Term Studies

In order to study the short term abnormal stock returns of the acquiring companies, a traditional event study is used. The classic event study examines abnormal returns to determine if and when a particular type of event affects stock valuations by measuring the magnitude of the effect that an unanticipated event has on the expected profitability and risk of a portfolio of firms associated with that event. Although a firm's profit is influenced by several factors, the event study methodology provides a means and unique opportunity to assess the impact of a particular strategy on a firm's expected future share price.

As documented by Loughran and Vijh (1997), evidence in mergers and acquisitions is usually based on returns computed over a pre-acquisition period starting immediately before the announcement date and ending on or before the effective date. This assumes that prices fully adjust to the likely efficiency gains from acquisitions. The theory underlying the event study methodology is the

efficient market hypothesis (Fama and al.,1969). According to this theory, if any new information resulting from an unexpected event is believed to affect a firm's current and future earnings, the security price changes as soon as the market learns of the event. The semi-strong form of the efficient market hypotheses requires that new information be impounded quickly into common stock prices. Under that assumption, the prediction errors should be distributed in a random fashion around zero. However, the assimilation of new and unexpected significant market information into the security prices may be reflected by abnormal returns for a short period of time. Therefore, stock prices are viewed as reliable indicators of a firm's value. The amount of change in the price of a security after an event, relative to its pre-event price, would reflect the market's unbiased estimate of the economic value of that event (Brown and Warner 1985). To examine whether an event had any impact on the firm's value, abnormal returns are measured.

3.1.1 Abnormal Stock Market Returns

Many methodologies are proposed in order to measure short term abnormal returns. The most well-known is the two step methodology with constancy of variance developed by Fama, Fisher, Jensen and Roll (1969). In their study, the authors look at the impact of a stock split on a company's stock price. As a first step, the methodology determines the expected stock return using the market rate of return and, as a second step, estimates the prediction error obtained by the differences between the actual rate of return for firm *j* and the expected return calculated in the first step.

Alternatively, Karafiath (1988) proposed a one step method by introducing dichotomous variables to obtain cumulative prediction errors and related test statistics. This method estimates in one step the estimation and the event window intervals as follow:

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \sum_{n=T+1}^{T+N} \tau_{jn} D_{nt} + \varepsilon_{jt}$$

t= 1,.....T, T+1,.....T+N

Where:

R_{jt}= Return to security j on observation t;
α_j= OLS estimate of the intercept;
β_j= Measure of the systematic risk;
R_{mt}= Return to the market on observation t;
τ_{jn}= Excess return to security j on observation t;
D_{nt}= Dummy variable equal to one on observation n and zero elsewhere
ε_{jt}= Residual for security j on observation t.

As mentioned by Karafiath (1988), "Since the N observations in the "forecast" interval are "dummied out", these observations will not affect the estimated slope or intercept; only the T observations without dummies determine the estimated slope and intercept." Also, the first T observations determine the estimated value of the slope and intercept and the residual will be zero for each observation in the event window. We can obtain the cumulative prediction error over a desired interval by aggregating the dummies' coefficients.

In our study, we used the one step procedure since, according to Karafiath (1998), it allows us to find identical results as the ones obtained from the two steps method.

3.2 Long-Term Studies

Fewer studies examine the assumption of market efficiency by measuring abnormal returns for the long-run pre- and post-announcement period. As pointed out by Barber and Lyon (1997), there are two main issues in tests designed to detect long-run abnormal stock returns. The first is the selection of an appropriate methodology for the calculation of abnormal stock returns and the second is the determination of a proper benchmark.

In the first part of this section, we review three different methodologies used for the calculation of the abnormal returns such as the cumulative abnormal return, the buy-and-hold abnormal return and the calendar-time abnormal return approaches. In the second part, the selection of a proper benchmark will be explored using the control firms and the portfolio approaches.

3.2.1 Abnormal Returns Calculation

There are several important components to measuring long-term abnormal stock price performance. Besides the determination of a proper benchmark, the computation of abnormal returns plays a key role in long-term performance study. Three approaches are explored for the computation of excess returns: cumulative-abnormal return (CAR), buy-and-hold abnormal return (BHAR) and calendar-time abnormal return (CTAR). Based on Barber and Lyon's (1997) and Mitchell and Stafford's (2000) articles, we describe their methodologies in the following sections,. In the spirit of Barber and Lyon (1997) and Loughran and Vijh

(1997) articles, we select, in a later section, the BHAR method for the empirical calculation of the abnormal returns.

3.2.1.1 Cumulative Abnormal Return (CAR)

Barber and Lyon (1997) observed that the convention in much of the research that analyses long term abnormal returns has been to sum the abnormal returns over time using the cumulative abnormal return method:

$$CAR_{i\tau} = \sum_{t=1}^{t} AR_{it}$$

Using this methodology, the null hypothesis is that the mean monthly abnormal return of the sample firms during the event year is equal to zero. The abnormal stock return is measured as the difference between the actual rate of return for firm i for period t (r_{it}) and its expected return $E(R_{it})$.:

$$AR_{it} = r_{it} - E(R_{it})$$

To test the null hypothesis that the CAR are equal to zero for a sample of n firms, the parametric test statistic is calculated as follow:

$$t_{CAR} = \overline{CAR_{it}} / (\sigma (CAR_{it}) / \sqrt{n})$$

The t-test reports the ratio of the estimated coefficient to its estimated standard deviation. Where $\overline{CAR_{it}}$ is the sample average and $\sigma(CAR_{it})$ is the cross-sectional sample standard deviations of abnormal returns for the sample of n firms.

Even if this method is traditionally used in most event studies, this approach is subject to a measurement bias, a new listing bias and a skewness bias. As documented by Barber and Lyon (1997), the authors refer to the new listing bias when the population mean CAR is positive and newly listed firms underperform market averages, while it is negative when newly listed firms outperform market averages. They anticipate that the population mean for CAR will be positively biased. The skewness arises because long-run abnormal returns are positively skewed. However, this positive skewness is less pronounced in CAR because the monthly returns of sample firms are summed rather than compounded. The measurement bias arises because, as shown in Barber and Lyon's (1997) study, CAR is a biased predictor of long-run BHAR. Although this method has been presented in the long-term study section for comparative purposes, the CAR approach is used in the short-run analysis in Karafiath (1988) method.

3.2.1.2 Buy-and-Hold Abnormal Return (BHAR)

Beginning with Ritter (1991), the most popular estimator in the literature of long-term abnormal performance is the mean BHAR. Barber and Lyon (1997) argue that BHAR is the appropriate estimator because it "precisely measures investor experience".

As mentioned by Mitchell and Stafford (2000), BHAR measures the average multiyear return from a strategy of investing in all firms that complete an event and selling at the end of a prespecified holding period versus a comparable strategy using otherwise similar nonevent firms. In other words, the abnormal

return is measured by the difference between the simple holding period returns on a sample firm less the buy-and-hold return on a control firm (nonevent firm):

$$BHAR_{i\tau} = \prod_{t=1}^{T} [1+R_{it}] - \prod_{t=1}^{T} [1+E(R_{it})] \qquad t= 1,.....T$$

A parametric test statistic is calculated to test the null hypothesis that the BHAR are equal to zero for a sample of n firms:

$$t_{BHAR} = \overline{BHAR_{it}} / (\sigma (BHAR_{it}) / \sqrt{n})$$

The t-test reports the ratio of the estimated coefficient to its estimated standard deviation. Where $\overline{BHAR_{it}}$ is the sample average and $\sigma(BHAR_{it})$ is the cross-sectional sample standard deviations of abnormal returns for the sample of n firms.

Even if Lyon, Barber and Tsai (1999), Barber and Lyon (1997) and Loughran and Ritter (in press) favour the use of BHAR to CAR, the BHAR approach suffers from three biases. The main drawbacks introduced by the BHAR method are the following:

1) New listing bias: since newly listed firms underperform market averages, the authors anticipate a positive bias in the population mean of long-run BHARs.

2) Skewness bias: long-run BHARs are severely positively skewed. The positive skewness leads to a negative bias in test statistics because of the positive correlation between sample means and sample standard deviations.

3) Rebalancing bias: Canina, Michaely, Thaler and Womack (1998) document that the magnitude of the rebalancing bias is more pronounced when one uses daily, rather than monthly, returns.

The above biases can be eliminated by carefully constructing benchmark portfolios, calculating an empirical p value from a simulated distribution of mean long-run abnormal returns or introducing a bootstrapped skewness-adjusted t-statistic procedure.

Lyon, Barber and Tsai (1999) present a skewness-adjusted t-test In order to eliminate the bias introduced in positively skewed distribution when long-run abnormal returns are calculated using buy-and-hold reference portfolios:

$$T_{sa} = \sqrt{n}\left(S + \frac{1}{3}\gamma S^2 + \frac{1}{6n}\gamma\right)$$

Where :

$S = \overline{AR_t} / \sigma(AR_t)$ and

$\gamma = \Sigma (\overline{AR_{it}} - AR_t)^3 / n\sigma(AR_t)^3$

As reported by Lyon, Barber and Tsai (1999) a bootstrapped application of this skewness-adjusted t-statistic "should be preferred to the t-test when the parent distribution is asymmetrical, because it reduces the probability of type 1 error in cases where the t-test has an inflated type 1 error rate and it is more powerful in other situations."

However, as reported by Mitchell and Stafford (2000), the problem with the bootstrapping procedure is that it assumes that event-firm abnormal returns are independent. In fact, event samples are unlikely to consist of independent observations since major corporate actions are not random events. As in Barber

and Lyon (1997), we favour the use of the BHAR method for our empirical test calculation and the construction of a proper benchmark will be carefully studied. Moreover, Barber and Lyon (1997) report that the control firm approach eliminates the skewness bias.

3.2.1.3 Calendar-Time Abnormal Returns (CTAR)

Although the calendar-time abnormal returns approach is not empirically tested in our study, we present in the following paragraph, as a recommendation for future research, the CTAR methodology based on Mitchell and Stafford (2000) study.

As discussed in the previous section, the BHAR approach suffers from meaningful biases. Fama (1998) documents that the traditional BHAR method ignores cross-sectional dependence of event-firm abnormal returns, which might lead to overstated test statistics. Mitchell and Stafford (2000) argue that there are essentially three approaches for dealing with cross-sectional correlation of abnormal returns. "The first approach is to ignore the problem by assuming that all event announcements are independent and that event firms are directly comparable to randomly selected non-event firms. The second approach is to recognise that cross-sectional dependence may be a serious problem and estimate the covariance structure. The final approach is to form calendar-time portfolios, which completely avoids the problems associated with cross-sectional dependence."

Mitchell and Stafford (2000) show that the CTAR methodology represents an important improvement over the traditional BHAR methodology by accounting for cross-sectional correlation between event firm abnormal returns. Thus, the calendar-time portfolio approach is proposed as an alternative measure of long-term stock price performance. This method tracks the performance of an event portfolio in calendar time relative to either an explicit asset-pricing model or some other benchmark. In this approach, portfolios are rebalanced monthly to add all companies that have just executed a transaction and drop all companies that reach the end of the pre-determined observation period.

The CTAR is the average abnormal return calculated each calendar month for all sample firms that have completed the event within the pre-determined observation period:

$CTAR_t = R_{p,t} - E(R_{p,t})$

Where:

$R_{p,t}$= Monthly return on the portfolio of event firms;
$E(R_{p,t})$ = Expected return on the event portfolio.

In Mitchell and Stafford's (2000) study, the expected return on the event portfolio is proxided by both 25 size-BV/MV portfolios and Fama and French (1993) three-factor model:

$$R_{p,t} - R_{f,t} = a_p + b_p(R_{m,t} - R_{f,t}) + s_p SMB + h_p HML + e_{p,t}$$

Where:

a_p = Measures of the average monthly abnormal return on the portfolio of event firms;
SMB = Difference between a portfolio of small stocks and big stocks;
HML = Difference between a portfolio of high BE/ME stocks and low BE/ME stocks.

As reported in Mitchell and Stafford (2000), "Fama (1998) strongly advocates a monthly calendar-time portfolio approach for measuring long-term performance. First, monthly returns are less susceptible to the bad model problem. Second, by forming monthly calendar-time portfolios, all cross-correlations of event-firm abnormal returns are automatically accounted for in the portfolio variance. Finally, the distribution of this estimator is better approximated by the normal distribution, allowing for classical statistical inference." After accounting for dependence, the authors empirically find that the calendar-time portfolio procedure has more power to identify reliable evidence of abnormal performance than the BHAR approach.

While the calendar-time portfolio approach solves the dependence problem associated with event-time abnormal performance measures, it has several potential problems that should be addressed. First, the regressions assume that the factor loadings are constant through time, which is unlikely since the composition on the event portfolio changes each month. Second, the changing portfolio composition may introduce heteroskedasticity as the variance is related to the number of firms in the portfolio. A third concern of this procedure is that the calendar time portfolio approach weights each month equally, so that months that

reflect heavy event actively are treated the same as months with low activity. Loughran and Ritter (in press) support this concern by arguing that the calendar-time portfolio approach has low power to detect abnormal performance because it averages over months of hot and cold event activity. Another concern is that the calendar time portfolio regression has low power to detect abnormal performance. Mitchell and Stafford (2000) argue that the calendar-time portfolio approach has sufficient power to detect abnormal performance. Also, Barber, Lyon and Tsai (1999) found that the CTAR approach yields an abnormal return measure that does not precisely measure investor experience.

3.2.1.4 Conclusion

As mentioned by Barber and Lyon (1997), "Cumulative abnormal returns yield positively biased test statistics, while buy-and-hold abnormal returns yield negatively biased test statistics." These results occur because of the differential impact of the new listing, rebalancing, and skewness biases on CAR and BHAR. Also, the main differences between the CARs and BHARs result from the effect of monthly compounding. As an example, it can be shown that CARs will be greater than BHARs if the BHAR is less than or equal to zero in the case where individual security returns are more volatile than the returns on the market index. The rebalancing bias does not affect the calculation of CAR, since the monthly returns of sample firms and the index are both summed rather than compounded. CARs are biased estimators of BHARs and Barber and Lyon (1997) refer to this as the measurement bias. Since both methodologies introduce different bias, Ritter (1991) argues that CARs and BHARs can be used to answer different questions.

As mentioned earlier, while the CTAR approach solves the cross-correlation problem associated with the BHAR, it has several potential problems that should be addressed. The general conclusion is that measuring long-term abnormal performance is treacherous when considering the pros and the cons of each method. In order to follow Loughran and Vijh (1997) and Barber and Lyon's (1997) study, we decide to use the BHAR method instead of the CAR or the CTAR.

3.2.2 Benchmark Evaluation

There is considerable variation in the measures of abnormal returns and the statistical tests that empirical researchers use to detect long-run abnormal returns. The selection of a proper benchmark is always problematic when examining long-term returns since many of the common methods used to calculate long-run abnormal stock returns lead to biased test statistics. In the following section, we explore two approaches for developing a long-run return benchmark such as the control firms and the reference portfolio approaches.

3.2.2.1 Control Firms Approach

In the control firms approach, sample firms are matched to control firms on the basis of specified firm characteristics. We favoured the control firm approach rather than any other approaches (reference portfolio or Fama-French three factor model) since the control firm approach eliminates most of the bias introduced by the buy-and-hold abnormal return calculation. The new listing bias is eliminated since both the sample and control firm must be listed in the identified

month. The rebalancing bias is also eliminated since both sample and control firm returns are calculated without rebalancing. Also, since the sample and control firms are equally likely to experience large positive returns, the skewness problem is also eliminated. In the following sections, we will review the Barber and Lyon (1997) and Loughran and Vijh (1997) methodologies. Both studies use the control firm approach as the chosen benchmark but the matching criteria and procedures differ.

3.2.2.2 Size and Book-To-Market Ratio Approach

Barber and Lyon (1997) document that matching sample firms to control firms of similar sizes and book-to-market ratios yields test statistics that are well specified and corrected for identified sources of misspecification. They define size as the number of shares outstanding multiplied by the closing price and the book-value as the common equity. As Fama and French (1992, 1993), they measure firm size in June of each year. Size rankings based on market value of equity in year T (announcement year) are then used from July of year T through June of year T+1. Also, they measure a firm's book-to-market ratio using the book value in year T-1 divided by the market value of common equity in December of year T-1. They also delete firms that report a book value of common equity that is less than or equal to zero. In order to match on both size and book-to-market, the authors first identify all firms with a market value of equity between 70% and 130% of the market value of equity of the sample firm; from this set of firms, they choose the firm with the book-to-market ratio closest to that of the sample firm.

3.2.2.3 The *F*-Value Approach

Loughran and Vijh (1997) find a relationship between the post-acquisition returns and the mode of acquisition and form of payment during the 1970-1989 period. They classify their initial sample based on the mode of acquisition (merger or tender offer) and the form of payment (stock, cash or mixed). Also, all the operating firms that were listed on either the NYSE, AMEX, or Nasdaq exchanges for at least five calendar years formed their matching universe. Since our study focuses only on the bidder stock performance and we do not make any distinction for the form of payment, we report only the relevant part of their study.

In order to examine long-term returns, the authors use a matching procedure that adjusts for size and book-to-market effects as the chosen benchmark for abnormal returns. The regression coefficients that explain long-term returns are obtained by regressing, each year, the one-year buy-and-hold returns on the natural logarithm of size and the natural logarithm of book-to-market. The regression size and book-to-market coefficients are then used to form a function that ranks all firms according the their yearly required returns on equity F-value.

Where:

$F = b_o + b_1 * size + b_2 * BV/MV$

Each year, all firms are ranked according to their F-value. The matching procedure pairs the acquiring firms with adjacent control firms in terms of F-value. The five-year buy-and-hold returns are calculated for the acquirers and matching firms over an identical time interval starting on the effective date plus one day.

The authors justified the length of the observation period by the fact that "the effect of restructuring decisions related to the appointment of new managers, combining operations of both companies and pursuing new investment opportunities should take a few years."

3.2.2.4 The Reference Portfolio Approach

Although the reference portfolio approach is not used in this thesis, a general idea of this method is presented based on Barber and Lyon's (1997) study. The authors calculate the monthly return for three different reference portfolios. The first set is constructed using ten size reference portfolios by averaging the monthly returns across all securities in a particular size decile in June of each year. The calculation of the size-benchmark return is equivalent to a strategy of investing in an equally weighted size decile portfolio with monthly rebalancing. The second set of reference portfolios analysed is ten book-to-market portfolios calculated in July of each year. The returns on the ten book-to-market reference portfolios are calculated in a fashion analogous to the ten size portfolios. The third set of reference portfolios is 50 size/book-to-market portfolios that are reconstituted in July of each year. First, in June of year t, all NYSE firms are ranked in the population on the basis of their market value of equity. Size deciles are then created based on these rankings for all NYSE firms. Within each size decile, firms are sorted into quintiles on the basis of their book-to-market ratios in year t-1.

Using reference portfolios such as equally weighted market index or size decile portfolio, to calculate long-run abnormal returns is problematic. The authors

document that test statistics based on abnormal returns calculated using a reference portfolio are misspecified and identify three reasons for this misspecification. The use of reference portfolios to calculate buy-and-hold abnormal return is subject to the new listing, rebalancing, and skewness biases that are difficult to correct.

4. Methodology

4.1 Short-Term Analysis

In this study, we used Karafiath's (1988) methodology to measure short term abnormal return. In order to calculate the abnormal returns, a linear regression has been conducted for each transaction using the following equation:

$$R_{jt} = \alpha_j + \beta_j R_m + \sum_{n=T+1}^{T+N} \gamma_{jn} D_{nt} + \varepsilon_{jt}$$

Each regression gives us three coefficients including the constant and two independent variables: the market return (β) and the dummy coefficient (γ_{jn}) which represents the abnormal returns for the event window. The dependent variable is represented by the daily share returns. We estimated the parameters of the market model for each firm by regressing its actual returns on the returns of an equally weighted portfolio of securities from the TSE Western database using an estimation period of 180 days. We then used the results to calculate the abnormal returns in the event window. The N observations are accumulated over three different event windows: (-4; 0), (-1; 1) and (0; 4) where T=0 is the announcement date. We use the announcement date instead of the effective date since, as reported by Jensen and Ruback (1983), "the announcement date occurs at random times prior to the effective date, using the effective date as the event date makes it difficult to identify changes in security prices that are due to the takeover event itself ". For most of the cases, the event day is the date when the news appeared in the print media. For example, the period –1 to +1 would include stock returns from the day before an announcement was published through the

day after the announcement was published. All the regressions and the required statistical tests have been performed using a Shazame program.

According to McWilliams and Siegel (1997), the selection of the length of the event window is "possibly the most crucial research design issue". They offered two reasons why it is so critical: "Using a long event window severely reduces the power of the test statistic" and "a short event window will usually capture the significant effect of an event". They also mention that the window should include some time prior to the announcement of the event so that abnormal returns associated with leakage (strong form market efficiency) will be captured. Hence, the event window (–4; 0) will try to capture this effect. Also, we used a short event window in order to avoid including the acquisition effective date.

4.2 Long-run Analysis

In our study, due to data availability, the long-term abnormal return is calculated over a four-year period. More specifically, the holding period returns have been calculated over a one year pre-announcement period and one, two and three year post-announcement periods. However, the length of the observation period is arbitrary and can be easily extended up to five years. Loughran and Vijh (1997) raise an interesting question as to why using a long window to measure excess return? Their answer is the following: "We are not aware of any model that predicts how long it should take for possible undervaluation or overvaluation effects to disappear. Besides, the effect of restructuring decisions related to the

appointment of new managers, combining operations of both companies, and pursuing new investment opportunities should take a few years."

In the following paragraphs, the methodology of the control firm approach as well as the BHAR and the related statistical test will be fully described.

4.2.1 Size And Book-To-Market Ratio Approach

Our study, in the spirit of Fama and French (1992) and Barber and Lyon (1997), uses, as the chosen benchmark for abnormal returns, a matching procedure that adjusts for size and book-to-market effects. As documented by Loughran and Vijh (1997), adjusting for size and book-to-market effects is important since acquisition samples are not usually distributed equally across the size and the book-to-market spectrum. Moreover, a third matching criteria is added in our procedure. Adjusting for industry in addition to size and book-to-market provides us with more accurate matches. As mentioned by Lyon, Barber and Tsai (1998), other firm characteristics can be used such as prior return performance, sales growth, industry, earnings yields, etc.

When we match on industry, size and book-to-market, we first identify all firms within the same industry as the sample firm. Then, we identify all firms with a size at T-1 (one year before the announcement date) between 85% and 115% of the size at T-1 of the sample firm. Finally, from this set of firms, we choose at T-1 the firm with a book-to-market ratio between 85% and 115% of the book-to-market ratio of the sample firm.

Our matching procedure differs from Barber and Lyon (1997) on three aspects. First, the authors did not match on an industry basis. Second, they used a range of 70% to 130% (instead of 85%-115%) to match for size and from this set, they chose the firm with the closest book-to-market ratio to the sample firm. Finally, for acquiring firms missing book values, they selected matching firms solely on the basis of size. In our study, we dropped the acquiring firm from the sample if either the size or the book-to-market ratio were missing. The alternative proposed by Barber and Lyon (1997) is a good way to increase the sample but reduces the power of the test since book-value is considered as an important matching criteria. Our adjustments provided more accurate matches than the with Barber and Lyon (1997) approach. The results are examined in section 5 of the current study.

4.2.2 The *F*-Value Approach

As a second approach, our study, in the spirit of Loughran and Vijh (1997), uses a matching procedure that pairs acquirers with matching firms by their required returns on equity. In order to get regression coefficients that explain long-term returns, each year we run a regression of one-year buy-and-hold returns on the natural logarithm of size and the natural logarithm of book-to-market. The size of the acquiring firm is computed with the stock price and the number of shares outstanding at year-end. Loughran and Vijh (1997) use the number of shares outstanding on the effective date plus one day. We did not follow their

methodology for the calculation of size because of the data availability. All firms are ranked according to their *F*-value using the following equation:

$F = b_0 + b_1 \times \text{size} + b_2 \times \text{book-to-market ratio}$

Once the *F*-value is found for each year and for each sample firm, the matching procedure pairs the acquiring firms with adjacent control firms within the range of 85% to 115% of the required return on equity (*F*-value). As opposed to Loughran and Vijh (1997) who select matching firms solely on the basis of size for acquiring firms missing book values, we drop the acquiring firms out of the sample for this particular year. We measured abnormal returns by the difference between three-year holding period returns of sample stocks and matching stocks. We start the calculation of the three-year holding period returns the month following the announcement date. In Loughran and Vijh's (1997) study, the five-year buy-and-hold returns are calculated starting on the effective date plus one day.

Also, in their study, if an acquirer is delisted prior to the end of the observation period, both the acquirer and matching firm buy-and-hold returns stop on that date. If a matching firm is delisted before the delisting date of acquirer, the next firm from the control sample with the closest required return on equity is chosen as the additional matching firm. In our study, we fill the acquirer missing returns with the control firm returns. In the case where control firm returns were missing, both the acquiring and control firm buy-and-hold returns stop on that month. Also, Loughran and Vijh (1997) excluded cases in which the target or the acquirer stock was trading at less than three dollars on the effective date, which

eliminates firms that are very small or in distress. In our study, we ignore the latter exclusion since TSE-listed companies are smaller than U.S companies and we do not consider the target in our study.

4.2.3 BHAR and Test-Statistic

As mentioned earlier, we used the BHAR for the calculation of the abnormal returns in order to partially replicate Barber and Lyon (1997) and Loughran and Vijh (1997) studies. If we recall, BHAR is measured by the difference between the simple holding period returns on a sample firm less the buy-and-hold return on a control firm:

$$BHAR_{i\tau} = \prod_{t=1}^{T} [1+R_{it}] - \prod_{t=1}^{T} [1+E(R_{it})] \qquad t= 1,.....T$$

To test the null hypothesis that the BHAR are equal to zero for a sample of n firms, the following conventional t-statistic is calculated:

$$t_{BHAR} = \overline{BHAR_{it}} / (\sigma (BHAR_{it}) / \sqrt{n})$$

As reported by Lyon, Barber and Tsai (1999), "the central limit theorem guarantees that if the measures of abnormal returns in the cross section of firms are independent and identically distributed drawings from finite variance distributions, the distribution of the mean abnormal return measure converges to normality as the number of firms in the sample increases". Thus, if the sample under consideration is sufficiently large, we expect that the conventional t-statistic will be well specified. In order to test if the t-statistic is well specified and if the large number rule applies, we generate an empirical distribution of mean long-run abnormal stock returns under the null hypothesis. The null hypothesis tests if the

mean long-run abnormal return equals the mean long-run abnormal return for the empirical distribution. The statistical significance of the sample mean is evaluated based on an empirical p-value inferred from an empirically generated distribution.

In this approach, we generate an empirical distribution of long-run abnormal stock returns under the null hypothesis. Specifically, we generate a sample of 500 companies randomly selected from our universe in order to form a pseudo-sample. Then, we apply our matching criteria (industry, size and BV/MV or industry and F-value) to our pseudo-sample in order to find a corresponding control firm for each sample firms. After forming a pseudo-sample, we estimate long-run performance using the BHAR approach as done previously in our original sample. The entire process is repeated until we have 500 pseudo-samples, and thus 500 mean abnormal returns observations.[1] These 500 mean abnormal return observations are used to approximate the empirical p-value. As mentioned by Lyon, Barber and Tsai (1999), this method yield well-specified test statistics in random samples and improved power in random samples relative to the control firm approach. However, this method is unable to control for two additional sources of misspecification: cross-sectional dependence in sample observations, and a poorly specified asset-pricing model.

[1] The program used to generate the empirical distribution has been provided by Dr. Sandra Betton.

5. Results Analysis

In this section, we first describe the sources, the data and the sampling procedure used in our study. Then, the sample is described in detail using dispersion measures. Finally, the results are analysed on a short- and long-term basis. Different hypothesises are studied in order to better understand stock price behaviour.

5.1 Data Description

In order to identify the Canadian companies involved in mergers and acquisitions activities, we used the Securities Data Corp. (SDC) database[2]. This database provides the announcement dates, the size, the form and the status of the transactions. This allowed us to identify more than 9807 transactions undertaken in Canada by Canadian acquirers and target companies from 1981 to 1998.

As a second step, this initial sample was cleaned and only the transactions classified under the following categories were kept: acquisition, merger, acquisition of major interests and acquisition of partial interests. We excluded all the cases defined as an acquisition of assets, a buyback, a recapitalisation or an exchange offer. This results in a sample of 4450 Canadian transactions.

Finally, we wanted to focus only on the Canadian companies listed on the TSE due to data availability. Hence, we used the TSE Review in order to identify the

[2] The financial information from the Worldwide Mergers and Acquisitions Database of the SDC has been provided by Dr. Sandra Betton.

companies listed on the TSE and their respective tickers. We removed from the current sample private, numbered, financial and crown companies, acquirers named as shareholders, companies listed on the Canadian Venture Exchange (CVE) and on the Montreal Stock Exchange (MSE). Also, we kept only the acquisitions that took place between 1988 to 1998. Our sample decreased from 4450 to 771 transactions involving 437 acquirers.

Financial information and daily stock returns have been extracted from the Stock Guide and the TSE Western Database respectively. For the long run studies, the required financial information (size, price, book-value and market value) were not available for every company for the entire sample period. At least two years of financial information were available for these 437 companies. The financial data in Stock Guide were available for both active and inactive companies. Our sample includes inactive companies, which avoids the introduction of a survivorship bias in our study. With the available financial information in Stock Guide, we define size as the total number of common shares outstanding times the share price at fiscal year-end. BV/MV is the ratio of fiscal year-end book equity divided by market capitalisation of common stock at fiscal year-end. According to Fama and French (1992), the BV/MV ratio is a very powerful predictor of returns across securities. Since fewer data are available for the long-term analysis, the sample for the short- and long term analysis are not identical. Two separate analyses will then be conducted.

To assess whether a firm is performing unusually well or poorly, we must specify the performance we expect in the absence of an event, thus providing a benchmark against which sample firms can be compared. For the long-term analysis, our potential matching universe included 1354 companies (968 active and 386 inactive firms) that were listed on the TSE and available from Stock Guide. In this paper, all the companies involved in mergers and acquisitions activities will be called the "Acquirer" and all the non-event companies being part of the benchmark sample will be called the "Control".

5.1.1 Sample Dispersion

During the 11 year observation period (1988-1998), merger and acquisition activities were mainly concentrated in the mid-nineties.

Table 1: Annual Number of Transaction in the Sample

Year of Acquisition Announcement	Acquisition in Sample
1988	24
1989	61
1990	43
1991	60
1992	54
1993	92
1994	82
1995	82
1996	107
1997	96
1998	70
1988-1998	771

Out of the 771 transactions, the transaction type was distributed as follows: 242 transactions were considered as an acquisition of partial interests, 143 as an acquisition of major interests, 385 as a merger and one as a pure acquisition. Out of these 771 transactions, 411 were completed, 239 pending, 75 withdrawn, 27 partially completed, 18 intended and 1 considered as a rumour.

The following table shows dispersion measures (mean, median and mode) of the matching criteria for the acquirers and the universe (potential control companies).

Table 2: Dispersion Measures for BV/MV, Size and Industry Classification

	BV/MV		Size ($000's)		Industry classification
Sample	**Mean**	**Median**	**Mean**	**Median**	**Mode**
Acquirers	0.65	0.64	640,720.31	88,377.33	Oil & Gas Producers
Universe	1.76	0.67	453,401.53	56,013.71	Oil & Gas Producers

According to Stock Guide, the classification of each company in the business group is determined according to the largest portion of its revenues. The most frequent business group for the acquirer and the potential control sample was the Oil and Gas Producers (23.80% and 19.47%). The second largest category is the Gold & Precious Minerals (10.75% and 7.54%) and the third largest is the Technology Hardware category (3.43% and 5.84%). These proportions are quite representative of the TSE, which is mainly composed of natural resources companies.

For the Acquirers' sample, the mean of the companies' size is $640,720,310 with a median of $88,377,330 compared to $453,401,530 and $56,013,710 respectively for the potential control firms. The mean, the median and the standard deviation for the acquirers' sample are higher than for the controls' sample. If we look at the BV/MV ratio, the mean and the median of the acquirers' sample are very similar compared to the controls' sample where the mean is much higher than the median. In fact, the potential controls' sample is positively skewed (15.445) compared to the acquirers' sample which is negatively skewed (-1.12) for the BV/MV ratio which might impact on the sample mean. In both samples, the median is quite similar (0.64 vs 0.67). These results are consistent with the literature since acquirers are more likely to have relatively low BV/MV ratio and large equity values.

It is also interesting to look at the mean and median of the BV/MV and size on an annual basis instead of looking at the average for the whole observation period. By doing this, we test if the companies characteristics vary from one year to another. As reported by Jensen and Ruback (1983), there is little systematic change in the firm-level size and book-to-market characteristics following an event. This suggest that the distribution of sample firms does not change very much between the pre- and post-event years.

Table 3: Distribution of BV/MV and Size per Year of Sample Event Firms

	BV/MV		Size		BV/MV*	Size*
Year	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Mean**
1988	0.8737	0.7383	544,484.80	58,607.63	0.8383	499,576.80
1989	7.1125	0.7363	587,926.98	67,361.19	0.8546	528,344,36
1990	6.4936	0.7823	482,335.42	53,167.09	0.8645	433,395,23
1991	6.6771	0.8575	448,167.42	46,352.25	0.8306	413,295,95
1992	-2.0843	-1.3625	443,746.56	56,865.60	0.6511	414,969,94
1993	-15.1123	0.4831	577,367.44	84,707.25	0.5689	545,065.78
1994	0.6172	0.6009	572,212.77	88,542.46	0.6172	541,904.18
1995	0.6277	0.6237	679,288.83	102,671.25	0.6531	643,234.64
1996	0.5528	0.5385	818,513,33	139,787.38	0.5831	769,341.89
1997	0.6241	0.5656	933,318.58	140,412.20	0.6232	867,192,34
1998	0.7608	0.6485	960,551.26	133,676.30	0.7981	896,460.18
Average	**0.6493**	**0.6415**	**640,720.31**	**88,377.33**	**0.7166**	**595,706.48**

* Modified ratios. The extreme values, i.e. the minimum and the maximum values of the initial sample have been taken out. For the number of observations per year, see Table 1.

We can see that the BV/MV mean varies considerably from one year to another. If we remove from each annual sample the minimum and the maximum value, our results notably change. We report only the mean of the modified ratios since the median does not change. As we can see, there is a greater uniformity for the BV/MV across the years. The median seems to be a more reliable measure than the mean because it is less sensitive to extreme values. As a general trend, the Size increases through years and consequently the BV/MV ratios decreases.

5.2 Short Term Analysis Results

The following short term study sought to test whether merger events provide positive or negative abnormal returns to the bidders in the short run. It is standard practice in an event study to examine abnormal returns for various windows

surrounding the event day for two reasons. First, analysing abnormal returns surrounding the event day allows for uncertainty regarding the actual date of the event. Second, it allows the researcher to capture the cumulative effect of an event since the effect may be spread over several days surrounding the event day due to the gradual availability of information. In the current study, we examine three different event windows, i.e. (-4;0), (-1,1), and (0, 4) and four sub-samples (mergers, acquisition of partial interests, acquisition of major interests and companies with less than 25% of returns missing). For the calculation purposes, we exclude from the initial sample all the transactions with returns missing within the event window period. Also, if an acquisition occurs within 180 days of a previously included acquisition by the same firm, then we remove the latter observation.

Table 4: Short Term Abnormal Returns under Alternative Event Windows and Hypothesis.

Sample Sizes	Event Windows	Constant	Beta	Gamma (Abnormal Returns)
Panel A: Abnormal Returns For The Entire Sample				
328	(-4; 0) *t-test*	0.26 E-02 *-0.04*	0.99 *2.43*	**0.58 E-02** ***0.05***
361	(-1; 1) *t-test*	-0.10 E-02 *-0.11*	0.92 *2.41*	**0.77 E-03** ***0.57 E-02***
344	(0; 4) *t-test*	0.64 E-03 *0.97 E-03*	0.99 *2.39*	**0.11 E-01** ***0.12***
Panel B: Abnormal Returns and Transaction Types				
Mergers				
147	(-4; 0) *t-test*	0.12 E-02 *0.10*	1.10 *2.30*	**0.63 E-02** ***0.03***
162	(-1; 1) *t-test*	0.32 E-03 *0.12*	1.04 *2.21*	**-0.14 E-02** ***-0.7***
156	(0, 4) *t-test*	0.13 E-02 *0.14*	1.14 *2.13*	**0.17 E-01** ***0.93 E-02***
Acquisition Of Partial Interests				
121	(-4; 0) *t-test*	0.29 E-03 *-0.26*	0.98 *2.85*	**0.42 E-02** ***0.18***
134	(-1; 1) *t-test*	-0.33 E-02 *-0.19*	0.85 *2.82*	**0.38** ***0.12***
132	(0; 4) *t-test*	0.16 E-04 *-0.20*	0.86 *2.79*	**0.61 E-02** ***0.24***
Acquisition of Major Interests				
60	(-4; 0) *t-test*	-0.42 E-05 *-0.02*	0.82 *2.11*	**0.32 E-02** ***-0.10***
65	(-1; 1) *t-test*	0.28 E-03 *0.05*	0.76 *2.10*	**-0.25 E-03** ***-0.04***
56	(0; 4) *t-test*	0.87 E-04 *0.07*	0.95 *2.19*	**0.46 E-02** ***0.18***
Panel C: Abnormal Returns less than 25% of returns missing				
277	(-4; 0) *t-test*	0.02 E-02 *-0.08*	0.96 *2.64*	**0.26 E-02** ***0.01***
299	(-1; 1) *t-test*	-0.18 E-02 *-0.01*	0.88 *2.42*	**-0.71 E-04** ***0.58 E-02***
283	(0; 4) *t-test*	0.17 E-03 *-0.04*	0.90 *2.56*	**0.11 E-01** ***0.03***

The results in Panel A of Table 4 show that from a statistical standpoint, there is no significant cumulative abnormal returns for any of the observed event windows. On an individual transactions basis, we find that very few stocks have significant abnormal returns.

By looking at the cumulative returns four days before the announcement date through the day of the announcement (-4,0), we take into consideration the possible leakage of information. Leakage occurs when there is a selective disclosure of the information regarding the relevant event before the official public release. In this case, the stock price might start to vary days or weeks before the official announcement date. If insider rules were perfectly obeyed and perfectly enforced, prices should show no abnormal returns on days before the public release of relevant news, because no special firm-specific information would be available to the market before public announcement. It is difficult to test for this hypothesis since the diffusion of information can occur at any time, from one day before the announcement date to as far as few months. Our results show no significant abnormal returns four days preceding the announcement through the announcement date. Our results can be interpreted in two ways, either insider rules are perfectly obeyed or information has been already disclosed and stock price has already reflected the new information.

Our results for the (–1,1) event window are consistent with the literature since Eckbo (1983) found similar results for successful bidding firms over an event period of one day before through one day after the offer announcement. Our results show a non-significant positive abnormal return of 0.77% compared to Eckbo's (1983) results of 7%. However, Eckbo's (1983) results are quite different for unsuccessful bidding firms, i.e. significant abnormal returns of 120% (t-stat. = 2,98). As mentioned by Jensen and Ruback (1983), "Positive abnormal returns to a bidding firm in response to the announcement that a takeover attempt is unsuccessful are inconsistent with the hypothesis that takeovers are positive net present value investments." In fact, "wealth-maximizing bidders will abandon takeover attempts when increments in the offer price would make the takeover a negative net present value investment."

The results for the (0; 4) event window show a non-significant positive average cumulative abnormal return of 1.12%. Ruback (1983) observed also non-significant results on the bidders' side for unsuccessful tender offers. For a sample size of 48 companies, they obtained a negative abnormal return of 0.38% (t-stat.= -0.63) for an event window of five days before through the offer announcement.

If we refer to Panel B of Table 4, the same conclusions of Panel A can be drawn, i.e. there is no significant abnormal returns over any event windows for any transaction types. The transaction type does not influence abnormal returns surrounding the announcement date. Jensen and Ruback (1983) report that

mergers are zero net present value investments for successful bidding firms but small positive abnormal returns are realised by bidders in successful tender offers. Those results are based on six different studies done with various event window lengths (one month announcement effects, two-day announcement effect, etc.) and by distinguishing transaction types (tender offers and mergers).

In Panel C of Table 4, we exclude from the original sample all the companies with more than 25% of daily returns missing (arbitrary cut off point). The sample sizes vary slightly between the three event window sub-samples due to the fact that we eliminate companies with returns missing in the event window period. However, on average, 17% of the companies have more than 25% of daily returns missing during the observation period. This is quite representative of the Canadian market which is not very liquid compared to the American market. By doing this, we tested if the lack of liquidity had an impact on our results. As we can see, the results are quite similar and the conclusion unchanged: there are no significant abnormal returns during the observed event window and the liquidity hypothesis is refuted.

5.2.1 Conclusion:

Our results are consistent with Schwert's (1996) results on the acquirer stock prices, which suggest that on average, the abnormal returns to bidders were not significantly different from zero for the period 1975 to 1991. These results suggest that merger bids are, on average, zero net present value investments. Few hypothesis might explain the absence of significant results: investors do not

value the merger signal, the positive signal offsets the negative one, or the stock price has already incorporated the event information due to a selective disclosure of information. One issue that complicates event studies analysis arises from leakage of information, which leads to attenuated estimates of the total returns to bidder firms. The attenuation bias arises when public knowledge of the acquiring firm's prior merger activity leads to partial anticipation of future merger bids. Since the market reacts to the unanticipated portion of the information in the acquisition announcement, the absence of abnormal returns for the days surrounding the announcement date is consistent with prior anticipation. Hence, the stock prices might already reflect knowledge about the mergers and the partial anticipation of acquisition activity attenuates the announcement effect. According to the efficient market hypothesis, immediately after the announcement date, the cumulative returns no longer increase or decrease significantly. Once the new information becomes public, the stock prices jump almost immediately in response to the good news.

On the bidders side, the benefit from mergers is less obvious than on the target side. Because of the premium involved, announcement of a takeover attempt is good news for shareholders of the target firm and therefore should cause stock prices to jump. As argued by Jensen and Ruback (1983) "the estimation of returns is more difficult for bidders than for targets. Since stock price changes reflect changes in expectations, a merger announcement will have no effect if its terms are fully anticipated in the market. Furthermore, targets are acquired once at most, whereas bidders can engage in prolonged acquisition programs."

5.3 Long Term Analysis

In the long term analysis, we calculated the BHAR for a pre-announcement and a post-announcement period. In both cases, the calculation of the returns begins in the calendar month following the announcement date in order to have a return clear from any confounding events. Hence, for the pre-announcement period, we looked at the abnormal returns for the 12 months preceding the announcement date (-12; -1). For the post-announcement period, we look at the compounded abnormal returns for the 12 (1; 12), 24 (1; 24) and 36 (1; 36) calendar months subsequent to the announcement date.

The monthly returns retrieved from the TSE Western Database were available only up to December 31st, 1999. Because of that, it was impossible to calculate post-announcement abnormal returns on a three year basis for the transactions occurring either in 1997 or in 1998. Despite this restriction, we kept those transactions in order to keep as many companies as possible in our sample.

In the calculation of returns, we replaced the missing monthly returns by zero. Thus, we made the assumption that there were no returns during those months. For delisted[3] companies, we followed Mitchell and Stafford's (2000) methodology and filled the missing returns with the control firm returns. Even with this data handling, not all of the sample's firms have a full 3 years of valid returns following

[3] Delisted companies are companies that have been taken over or companies that did not meet the financial requirements of the TSE .

the announcement date. For those transactions, a shorter observation period was used.

5.3.1 Results Analysis under Size and BV/MV Approach

In the overall sample of 771 transactions, we found 234 potential matches based on Size, BV/MV and Industry classification. The control firms that met the matching criteria were classified in the same business group and had a company size and a BV/MV ratio in the range of 0.85 to 1.15 times the acquiring firms size and BV/MV ratio. On average, the size ratio of the control companies over the acquiring firms was 1.002 times and the BV/MV ratio of the control companies over the acquiring firms was 0.883. We obtained a closer match with the size ratio rather than the BV/MV ratio. For the industry matching criteria, 63% of our sample is in the Oil and Gas Producers industry and 10.28% is in the Gold and Precious Minerals industry (for further information, see Appendix A). This sample is very representative of the initial sample since the Industry Group is represented in similar proportions.

Because of the monthly returns availability, our sample of 234 transactions decreases for the calculation of the long term abnormal returns. This reduction of the sample is partly due to the fact that 55 of the 234 transactions occurred in 1997 and 1998. For those transactions, we could only examine the pre-announcement abnormal returns and the one or two year abnormal returns. In the following sections, the empirical results are split under two broad categories: unconditional and conditional hypotheses. The unconditional hypothesis applies

no limitation to the original sample, i.e. the sample size varies from one period to another due to delisting and missing returns. The second category, the conditional hypothesis, required that the monthly returns must be available for the entire four year observation period (pre- and post-announcement period). In both cases (unconditional and conditional), the results are submitted to alternative hypothesis such as transactions types and restricted hypothesis (see appendix II for a complete description of the hypothesis).

5.3.1.1 Unconditional Hypothesis

Table 5: Announcement-Induced Average Abnormal Returns under Size and BV/MV Approach and Unconditional Hypothesis

Period	Sample Size (N)	Acquirers	Controls	BHAR	T-Test	Skewness
Panel A : Abnormal Returns Under The Unconditional Hypothesis						
-12, -1	118	26.83%	19.38%	7.45%	1.01	-0.45
1, 12	117	5.49%	7.09%	-1.60%	-0.29	-1.00
1, 24	92	10.57%	1.29%	9.28%	0.78	4.79
1, 36	67	19.74%	3.16%	16.58%	0.99	2.28
Panel B: Abnormal Returns under Alternative Hypothesis						
B.1: Transaction Types						
Mergers						
-12, -1	65	27.46%	22.67%	4.79%	0.45	-0.01
1, 12	65	-2.09%	1.51%	-3.60%	-0.56	-0.35
1, 24	48	29.58%	11.80%	17.78%	0.86	4.82
1, 36	34	28.46%	5.73%	22.73%	0.84	2.77
Acquisition Of Partial Interests						
-12, -1	35	15.49%	13.77%	1.72%	0.15	-2.05
1, 12	37	7.69%	-0.45%	8.14%	0.81	0.24
1, 24	34	-14.37%	-14.40	0.03%	0.003	-0.18
1, 36	24	-1.26%	-8.09%	6.83%	0.32	4.82
Acquisition Of Major Interests						
-12, -1	18	46.59%	18.40%	28.19%	1.43	-0.61
1, 12	15	32.93%	49.82%	-16.89%	-0.74	-2.57
1, 24	10	4.17%	4.23%	-0.06%	-0.004	-1.93
1, 36	9	42.78%	23.41%	19.37%	0.41	0.37
B.2: Restricted Hypothesis						
-12, -1	78	25.51%	16.46%	9.05%	1.01	-0.55
1, 12	77	1.14%	5.41%	-4.26%	-0.23	-1.40
1, 24	45	-4.09%	8.97%	-13.06%	0.78	-0.66
1, 36	29	3.50%	28.66%	-25.16%	0.99	-0.63

If we refer to Panel A of Table 5, we first test, on an unconditional basis, if the mean annual abnormal return is equal to zero. The results show no significant abnormal returns for both the pre- and post-announcement period. Also, we can see that the sample is positively skewed two and three years following the announcement. As a general trend, BHAR are all positive except for the year following the announcement date. Our results are consistent with the literature to

some extent: Malatesta (1983) and Dodd and Ruback (1977) report insignificant negative abnormal returns in the year following the announcement date while Asquith (1983), Bradley et al.(1983), Langetig (1978) report significant negative abnormal returns in the year following the announcement date. A potential explanation for the negative returns can be that for the year following the announcement date, the market underestimates the efficiency gains from acquisitions or the market perceived that the integration costs involved in the merger and acquisition are higher than the gains from operating synergies.

5.3.1.2 Abnormal Returns And Transactions Types

In order to further investigate the absence of significant abnormal returns, we divided our sample into three subsets based on the transaction types. Then, we calculated the abnormal return for each subset as shown in Panel B.1 of Table 5. As mentioned by Loughran and Vijh (1997), the mode of acquisition may be related to the expected wealth gains resulting from operating synergies and the disciplining of target managers. However, the same general conclusion can be drawn than from the entire sample (Panel A): there are no significant abnormal returns for the entire observation period. The merger subset seems to follow the same trend as the entire sample: positive abnormal returns for the pre-announcement period and for the 2 and 3 years following the announcement date. The year following the announcement date experiences small negative returns. Also, as for the entire sample, the merger sample is positively skewed for the 2 and 3 years post-announcement. The acquisition of partial interests subset does not experience any negative returns for the entire observation period.

5.3.1.3 Restricted Unconditional Hypothesis

As mentioned earlier, in our abnormal calculation, we filled all the missing returns of the acquiring company either with zero or with the returns of the control company. This data handling may introduce a potential survivorship bias since delisted companies will be artificially maintained in the sample. Hence, in order to further investigate the previously reported results, we test the abnormal returns on a restricted unconditional basis i.e. without filling in the missing returns.

For the pre-announcement period, we obtain a non-significant abnormal return of 9.05% under the restricted hypothesis compared to 7.45% for the original sample (Panel A). Surprisingly, we obtain very different results between both samples for the 2 and 3 year post-announcement periods. As opposed to the unrestricted sample where the abnormal returns are positive for the 2 and 3 years post-announcement periods, we obtain in the restricted sample negative abnormal returns of –13.06% and –25.16% respectively compared to 9.28% and 16.58% for the unrestricted sample. This can be explained by the fact that the highest frequency of substituted returns takes place after 2 or 3 years. Hence, the abnormal returns are greatly influenced by these substitutions. The skewness coefficients are 4,79 and 2,28 for the unrestricted sample for the 2 and 3 year post-announcement compared to –0,66 and –0,63 respectively for the second sample. Moreover, the returns of the control companies positively skewed the returns of the unrestricted sample and the restricted sample better reflects the real behaviour of the acquirer stock returns. Hence, we can conclude that the acquiring companies experienced non-significant positive abnormal returns for

the pre-announcement period and non-significant negative abnormal returns for the post-announcement period.

5.3.1.4 Conditional Hypothesis

The sample significantly decreases by applying a conditional hypothesis, i.e. all the monthly returns must be available for the entire 4 year observation period (pre-announcement and post-announcement period). We first test (Panel A, Table 6) if the mean annual abnormal return is equal to zero on a conditional basis. Hence, from our sample of 234 matches, all the firms with an announcement date in either 1997 or 1998 and all the control companies delisted before the end of the observation period have been excluded. For the acquirers delisted before the end of the observation period, the missing returns have been replaced by the control returns, if available.

Table 6 : Announcement-Induced Average Abnormal Returns under Size and BV/MV Approach and Conditional Hypothesis

Period	Sample Size (N)	Acquirers	Controls	BHAR	T-Test	Skewness
Panel A: Abnormal Returns under The Conditional Hypothesis						
-12, -1	62	42.45%	20.25%	22.20%	2.062	0.55
1, 12	62	10.68%	10.07%	0.61%	0.085	-0.43
1, 24	62	11.67%	5.97%	5.70%	0.346	4.93
1, 36	62	13.92%	4.59%	9.32%	0.534	2.50
Panel B: Abnormal Returns under Alternative Hypothesis						
B.1: Transaction Types						
Mergers						
-12, -1	30	51.87%	16.82%	35.05%	2.17	1.97
1, 12	30	13.71%	17.54%	-3.83%	-0.35	-0.50
1, 24	30	42.76%	23.56%	19.20%	0.60	4.41
1, 36	30	26.85%	11.02%	15.83%	0.52	2.86
Acquisition Of Partial Interests						
-12, -1	23	19.59%	23.41%	-3.82%	-0.23	-1.91
1, 12	23	4.57%	4.15%	0.41%	0.03	-0.26
1, 24	23	-27.13%	-16.91%	-10.22%	-0.64	-0.78
1, 36	23	-14.24%	-11.15%	-3.09%	-0.16	0.75
Acquisition Of Major Interests						
-12, -1	9	69.48%	23.58%	45.90%	1.84	0.69
1, 12	9	16.20%	0.27%	15.93%	1.13	-0.03
1, 24	9	7.18%	5.77%	1.41%	0.08	-2.01
1, 36	9	42.78%	23.41%	19.37%	0.41	0.37
B.2: Restricted hypothesis						
-12, -1	23	42.47%	18.80%	23.67%	1.244	-1.39
1, 12	23	14.54%	17.26%	-2.72%	-0.253	-0.67
1, 24	23	2.18%	22.27%	-20.10%	-1.597	-0.41
1, 36	23	8.94%	32.01%	-23.06%	-1.169	-0.71

The results stated in Panel A of Table 6 are very interesting. It is clear that there is a significant abnormal return for the 12 months preceding the announcement date. For an average return of 42.45% for the acquirers versus an average return of 20.25% for the control companies, the result shows the presence of a significant run-up abnormal return of 22.20%. This run-up return might be explained by a leak of private information and/or insider trading. Schwert (1996)

shows that the subsample that was subsequently involved in insider trading litigation result in higher run-ups. Also, Schwert (1996) found that bidder firms had unusual stock price increases prior to their decisions to make takeover bids. Our results are also consistent with Jabbour, Jalivand and Switzer (2000) who report that target experiences abnormal returns ranging from 17.2% to 32.35%.

Moreover, this result is not consistent with a market that is highly competitive since bidders can earn extra returns on average. Also, this result partially invalidates the Hubris hypothesis for which bidders must experience negative abnormal returns over the run-up plus the mark-up periods combined. Here, the bidders will earn an extra return of 20.25% over the pre-announcement period and 4.59% over the post-announcement period for a combined return of 25.77%. A study done by Schwert (1996), on the US market, showed that the pre-announcement CAR (run-up) and the post-announcement CAR (mark-up) are not correlated. Also, the study concludes that because little substitution takes place between the run-up and the mark-up, the run-up is an added cost to the bidder.

If we compare the results under the conditional and the unconditional hypothesis for the pre-announcement period, we can see that the significant positive excess return under the conditional hypothesis of 22.20% is higher than the non-significant one of 7.45% for the unconditional sample. In both samples (conditional and unconditional), the control sample has similar returns (20,25% and 19,38% respectively) but the discrepancy between the two abnormal returns are mainly due to the acquiring companies. In fact, the acquirers' returns from

the unconditional sample are 26.83% compared to 42.45% for the conditional sample. A potential explanation might be that a greater number of companies from the unconditional sample have been delisted in the post-announcement years and those delisted companies under-perform compared to the undelisted companies. Hence, we see that the conditional hypothesis introduces a potential look-ahead bias.

However, the differences between the post-announcement returns of the conditional and unconditional samples are less obvious. The general observation is that the acquirers' and the controls' returns in the conditional sample are higher than the unconditional sample for the post-announcement period. The only exception is that the acquirers' return of the conditional sample is lower than the unconditional sample for the whole 36 month post-announcement period. Moreover, the abnormal returns are higher for the unconditional sample for the 24 and 36 months following the announcement date. In conclusion, there are no significant abnormal returns. Using a very similar methodology but with a bigger sample size (1000 samples of 200 firms) Barber and Lyon (1997) found for the U.S market a non-significant abnormal return of 2.3% for the 3 year post-announcement period.

5.3.1.5 Abnormal Returns and Transaction Types

In order to further investigate the origin of the abnormal returns of the pre-announcement period and stock returns behaviour, we divided our sample in three subsets based on the transaction types. Then, we calculated the abnormal

return for each subset. As we can see, in the mergers subset, we observe a significant run-up period with an average abnormal returns of 35.05%, which is higher than the non-significant abnormal returns of 22.20% for the combined sample. Because, 48% of the entire sample is composed of mergers transactions and in the acquisition of partial and major interest there are no pre-announcement abnormal returns, we can conclude that the abnormal run-up period is attributable only to the mergers transactions. This can also be explained by the fact that mergers are probably viewed by investors as major events compared to the acquisition of partial or major interests. Also, probably more speculation is based on potential mergers and also more insider information may be transmitted before the announcement date. For the post-announcement period, the sub-sample results are consistent with the combined sample's results, i.e. there are no significant abnormal returns.

5.3.1.6 Restricted Conditional Hypothesis

As before with the unconditional sample, we restricted our conditional sample by keeping only the companies without any missing returns. Thus, we dropped from the sample the delisted companies or the companies with missing returns. Our sample decreased from 62 to 23 companies.

We obtain similar results those with the restricted unconditional sample. In both cases, we have non-significant positive abnormal returns for the pre-announcement period and non-significant negative abnormal returns for the post-announcement period. The same conclusions can be drawn; by filling the

missing returns or the delisted companies with controls' returns, we overestimate the acquirers' returns. For the entire post-announcement period under the conditional hypothesis, the absolute discrepancy between the restricted and the original sample is in the order of 32.38% (9.32% to –23.06%). Hence, data selection has a large impact on the magnitude of the results.

For the pre-announcement period, we obtain a non-significant abnormal return of 23.67% compared to 22.20% for the original sample. The BHAR are in the same range even though it is not statistically significant in the latter case. Surprisingly, we obtain very different results for the 3 year post-announcement period. As opposed to the unrestricted sample where the abnormal returns are all positive, we obtain in the latter sample negative abnormal returns. However, in both samples, the abnormal returns are not significant. A potential explanation for the negative returns can be that the market underestimates the efficiency gains from acquisitions or the market perceived that the integration costs involved in the merger and acquisition are higher than the gains from operating synergies. The biggest discrepancies between the two samples are observed 2 and 3 years after the announcement date. Abnormal returns of –20.10% and –23.06% are observed in the restricted sample for the 2 and 3 years post-announcement date respectively compared to 5.70% and 9.32% for the unrestricted sample. This can be explained by the fact that the biggest amount of substituted returns take place after 2 or 3 years. Hence, the abnormal returns are greatly influenced by these substitutions. Moreover, the returns of the control companies positively skewed the returns of the unrestricted sample and the restricted sample better reflects

the real behaviour of the acquirer stock returns. The skewness coefficients are 4.93 and 2.50 for the unrestricted sample for the 2 and 3 year post-announcement compared to –0.41 and –0.71 respectively for the second sample. Hence, we can conclude that the acquiring companies experienced non-significant positive abnormal returns for the pre-announcement period and non-significant negative abnormal returns for the post-announcement period.

5.3.1.7. Conclusion

As a general statement, there are no significant abnormal returns for the post-announcement period under any hypothesis. Restricting the sample under conditional or unconditional hypothesis or the transaction types, does not make any difference for the post-announcement period. However, pre-announcement significant positive abnormal returns are found under the conditional hypothesis and for the merger subset.

5.3.2 Results Analysis under the F-Value Approach

Based on the matching criteria developed by Loughran and Vijh described in section 3.2.2.3 and on the industry group, we found 364 potential matches out of the 771 transactions. Those 364 control companies were classified in the same industry and have the closest F-value to their matching acquiring firms. Thirty-four percent (34%) of our sample is in the Oil and Gas Producers industry and the Gold and Precious Minerals represents the second largest group (18%). On average, the F-value of the control company was 0.9972 times the F-value of the

acquiring firm. When an acquirer has more than one corresponding control company, we kept only the closest match, i.e. the one with the closest F-value.

In our statistical test, our sample decreases due to the monthly returns availability. Indeed, 88 of the 364 transactions occurred in 1997 and 1998. For those transactions, we looked at the pre-announcement abnormal returns and at one or two years post-announcement abnormal returns. Those transactions have been included in our unconditional tests but excluded from the conditional tests for which all the returns for the entire observation period must be available.

5.3.2.1 Unconditional Hypothesis

Table 7: Announcement-Induced Average Abnormal Returns under F-Value Approach and Unconditional Hypothesis

Period	Sample Size (N)	Acquirers	Controls	BHAR	T-Test	Skewness
Panel A : Abnormal Returns under the Unconditional Hypothesis						
-12,-1	214	60.54%	27.65%	32.88%	1.20	12.62
1, 12	230	16.58%	22.36%	-5.78%	-0.88	-2.83
1, 24	198	54.93%	30.71%	24.22%	1.18	0.72
1, 36	155	126.32%	27.35%	98.97%	1.28	11.04
Panel B: Abnormal Returns under Alternative Hypothesis						
B.1: Transaction Types						
Mergers						
-12, -1	102	31.98%	21.96%	10.02%	0.97	2.09
1, 12	107	19.08%	8.11%	10.97%	1.69	0.96
1, 24	90	104.83%	20.41%	84.42%	2.44	3.86
1, 36	62	99.79%	2.49%	97.30%	2.55	3.14
Acquisition Of Partial Interests						
-12, -1	73	110.90%	29.90%	81.00%	1.03	7.79
1, 12	80	11.84%	26.65%	-14.81%	-1.13	-3.06
1, 24	72	-0.79%	31.86%	-32.66%	-1.06	-7.14
1, 36	62	182.41%	42.03%	1.40%	0.75	7.64
Acquisition of Major Interests						
-12, -1	39	40.93%	38.32%	2.61%	0.22	-1.35
1, 12	43	19.17%	49.83%	-30.66%	-1.62	-3.04
1, 24	36	41.65%	54.18%	-12.53%	-0.39	-1.68
1, 36	31	66.12%	52.04%	14.08%	0.29	-0.09
B.2: Restricted Unconditional Hypothesis						
-12, -1	117	30.81%	21.81%	9.00%	0.72	-5.05
1, 12	133	19.68%	16.61%	3.08%	0.39	-1.39
1, 24	92	86.76%	11.27%	75.49%	2.24	3.88
1, 36	60	60.50%	2.63%	63.12%	2.07	3.63

We can observe, under the unconditional hypothesis (Panel A of Table 6), positive non-significant abnormal returns for the pre-announcement period, negative non-significant abnormal returns 12 months following the announcement date and increasing positive non-significant abnormal returns for the 24 and 36 months following the announcement date. However, even if it is not significant from a statistical standpoint, the results show a high positive abnormal return of

98% after three years. The non-significance of the abnormal return from a statistical basis might be explained by the fact that the sample is highly positively skewed which downwardly biases the test-statistics. The skewness coefficients are 12.62 and 11.04 for the pre-announcement period and the three-year post-announcement period respectively. Although Barber and Lyon (1997) report that the control firms approach eliminates the skewness bias, this theory does not seem to hold with the F-value control firms approach. In general, our results are consistent with Franks, Harris and Titman (1991) results that find no evidence of significant abnormal returns over a three-year post-announcement period.

5.3.2.2 Abnormal Returns And Transactions Types

As we can see, in the mergers subset, we observe very high significant positive abnormal returns of 84% and 97% for the 2 and 3 year post-announcement periods respectively. The abnormal return of 84% is much higher than the abnormal return of 24% for the entire sample (Panel A). However, the significant positive abnormal return of 97% for the merger subset is very similar to the non-significant abnormal return of 98% for the entire sample. Hence, the merger subset and the skewness of the distribution have a big impact on the magnitude of the abnormal returns of the 3 year holding period.

5.3.2.3 Restricted Unconditional Hypothesis

Different results are found by restricting our sample and keeping only the companies without any missing returns. In Loughran and Vijh's (1997) sample, if an acquirer is delisted prior to the end of the observation period, both the

acquirer and the matching firm buy-and-hold stop on that date is a procedure, which is similar to our restricted condition. However, if a matching firm is delisted before the delisting date of acquirer, they chose the next firm with the closest required return on equity as the additional matching firm.

We found significant positive abnormal returns of 75% and 63% for the 24 and 36 months following the announcement date as with the merger subset. Although the restricted hypothesis introduces a look-ahead bias by keeping only the surviving companies, those results clearly show that an individual who holds stocks of a surviving bidder can earn extra returns in the long run.

5.3.2.4 Conditional Hypothesis

From our sample of 364 matches, we exclude the 88 acquirers and their corresponding control firms with an announcement date in 1997 or 1998. Also, we exclude all the acquirers for which the corresponding benchmark had missing returns or were delisted before the end of the observation period. Indeed, no substitution of the missing returns of the acquirers by the controls' returns has been performed.

Table 8: Announcement-Induced Average Abnormal Returns under F-Value Approach and Conditional Hypothesis

Period	Sample Size (N)	Acquirers	Controls	BHAR	T-Test	Skewness
Panel A: Abnormal Returns under the Conditional Hypothesis						
-12, -1	132	76.07%	21.45%	54.62%	1.27	10.88
1, 12	132	16.34%	22.15%	-5.81%	-0.73	-1.11
1, 24	132	44.61%	17.05%	27.56%	1.39	4.79
1, 36	132	135.12%	18.71%	116.41%	1.31	10.49
Panel B: Abnormal Returns under Restricted Conditional Hypothesis						
B.1: Transaction Types						
Mergers						
-12,-1	53	30.69%	20.63%	10.07%	0.64	1.95
1, 12	53	16.78%	7.61%	9.17%	0.84	0.98
1, 24	53	95.70%	16.21%	79.50%	1.78	3.86
1, 36	53	107.77%	-5.26%	113.03%	2.62	3.12
Acquisition of Partial Interests						
-12,-1	54	140.43%	16.39%	124.04%	1.20	7.24
1, 12	54	9.96%	21.21%	-11.25%	-0.91	-0.80
1, 24	54	-6.37%	3.61%	-9.98%	-0.90	-0.59
1, 36	54	209.30%	21.49%	187.81%	0.88	7.25
Acquisition of Major Interests						
-12, -1	25	34.58%	36.13%	-1.55%	-0.09	-1.34
1, 12	25	21.17%	47.50%	-26.33%	-1.15	-2.79
1, 24	25	38.29%	38.59%	-0.30%	-0.01	0.72
1, 36	25	30.43%	53.53%	-23.10%	-0.50	-2.72
B.2: Restricted Conditional Hypothesis						
-12, -1	48	39.10%	2.28%	36.82%	2.57	2.93
1, 12	48	11.13%	13.23%	-2.10%	-0.23	0.81
1, 24	48	36.09%	-1.76%	37.85%	1.21	5.73
1, 36	48	27.48%	-3.86%	31.35%	1.24	3.96

The first observation in Panel A of Table 8 is that, for the 3 year post-announcement period, the average returns of the acquirers sample (135.12%) is not significantly different than the average returns of the benchmark sample (18.71%) for an non-significant abnormal returns of 116.41%. This result is very surprising since the magnitude of the BHAR is very high. The non-significance of

the BHAR can be explained by looking in depth at the parametric test statistic (T-Test) calculation and at its components. Also, the truncation of many holding periods to less than 3 years may have understated the t-statistic.

As explained in section 3.2.1.2, the t-statistic for the BHAR is calculated as follows:

$$t_{BHAR} = \overline{BHAR_{it}} / (\sigma (BHAR_{it}) / \sqrt{n})$$

For the 3 year observation period, the components are the following:

$BHAR_{it}$:	1.1641
$\sigma (BHAR_{it})$:	10.2176
$\sqrt{n}$:	11.4891

As we can see, the standard deviation is very high and the sample is positively skewed (10.4887). Skewness bias arises because long-run buy-and-hold abnormal returns are positively skewed. Also, the median of the sample is 0.1814 which is far from the mean. Hence, we can deduct that extreme positive observations have outstanding results and thus, inflate the total result. As mentioned by Barber and Lyon (1997), conditional on observing a positive sample mean, the inflated estimate of the cross-sectional standard deviation will lead to a downwardly biased test statistic. The skewness bias introduced by the buy-and-hold-abnormal returns methodology does not seem to be completely eliminated using the F-value approach compared to the size and BV/MV approach.

The general conclusion that can be drawn from our results is the absence of significant abnormal returns for the entire observation period. Consequently, a

shareholder does not have any advantage in holding shares of a company that has been involved in mergers activities compared to holding shares of a company that did not merge.

5.3.3.5 Abnormal Returns And Transaction Form

As done previously in section 4.3.2.2, the average abnormal returns can be observed by transaction type. The merger subset represents 40% of the whole sample, the acquisition of partial interests represents 41% and the acquisition of major interest represents 19%.

These results are very interesting since we observe significant average abnormal returns of 113.03% for the 3 years following the announcement date in the merger subset. After 3 years, probably the investors notice the gains resulting from the operating synergies. Also, after 2 years, we observe an important non-significant positive abnormal return of 79.50%. On the basis of these results, we can conclude that shareholders who hold shares of companies involved in mergers earn important extra returns. Our results are very different than Loughran and Vijh's (1997) findings since they found that merger bids earn 15.9% less than matching firms. However, the authors split their sample in two groups: mergers and tender offers and they probably considered the acquisition of partial and major interests as part of the merger category. However, this sub-sample is not representative of the combined sample if we do not take into consideration the transaction type. In the Acquisition of Major Interests subset, there is no significant abnormal return for the observation period. However, the

main observation is that the average abnormal return is negative for the pre and post-announcement period. As a general conclusion, Mergers are the only form of transaction that significantly affect bidders' stock returns. In future research, further investigation should be made in order to test the robustness of these results.

5.3.3.6 Restricted Conditional hypothesis

As in section 5.3.2.3, we recalculate the abnormal returns under a restricted hypothesis. For the pre-announcement period, we obtain a significant abnormal return of 36.82% compared to a non-significant return of 54.62% for the unrestricted sample. We obtain similar results in the unrestricted sample for the post-announcement period, i.e. non-significant abnormal returns. For both cases, even though the results are not significant, we obtain negative abnormal returns for the 12 months following the announcement date. Also, the abnormal return for the 3 year period is smaller (31.35%) than the unrestricted sample (116%). We can see that the sample is also less skewed (3.96) than the unrestricted sample (10.49). In the restricted sample, the returns of the acquirers and the control firms significantly decreased compared to the returns in the unrestricted sample.

We can conclude that the acquiring companies experienced significant positive abnormal returns for the pre-announcement period and non-significant negative abnormal returns for the post-announcement period under the restricted hypothesis.

5.3.3.7. Results Analysis and the Empirical P-Value

As related earlier in this study, commonly used methods to test for long-run abnormal returns yield misspecified test statistics and three main biases (new listing, rebalancing and skewness) contribute to this misspecification. As mentioned by Barber and Lyon (1997), the control firm approach is specifically designed to control for those bias. However, even with the use of the control firm method, our results do not seem to be free of skewness bias. Hence, in this section, we control for this bias by applying an empirical p values calculated from a simulated distribution of mean long-run abnormal returns estimated from pseudo-sample. Kothari and Warner (1997) note that this method "seems like a promising framework for alternative tests which can potentially reduce misspecification".

In the following table, we report under the conditional and unconditional hypotheses of both approaches (size-BV/MV and F-value), the BHAR results, the standard t-statistic and the empirical p-value inferred from the empirical distribution. Also, the empirical cut-off point for a 5% level of significance under the empirical distribution is reported.

Table 9 : Empirical Distribution and P-Value

Period	BHAR	T-Test	P-value	Empirical BHAR Cut-Off Point *
Panel A: Size and BV/MV Approach and Unconditional Hypothesis				
-12, -1	7.45%	1.01	0.56	70%
1, 12	-1.60%	-0.29	0.61	60%
1, 24	9.28%	0.78	0.55	120%
1, 36	16.58%	0.99	0.57	244%
Panel B: Size and BV/MV Approach and Conditional Hypothesis				
-12, -1	22.20%	2.062	0.39	176%
1, 12	0.61%	0.085	0.58	124%
1, 24	5.70%	0.346	0.53	131%
1, 36	9.32%	0.534	0.48	231%
Panel C: F-Value Approach and Unconditional Hypothesis				
-12, -1	32.88%	1.20	0.16	80%
1, 12	-5.78%	-0.88	0.64	61%
1, 24	24.22%	1.18	0.39	1365
1, 36	97.89%	1.28	0.19	223%
Panel D: F-Value Approach and Conditional Hypothesis				
-12, -1	54.62%	1.27	0.14	227%
1, 12	-5.81%	-0.73	0.50	79%
1, 24	27.56%	1.39	0.26	235%
1, 36	116.41%	1.31	0.11	231%

* For a 5% level of significance

In order to construct the empirical distribution, we select randomly 500 firms and event dates between 1988 and 1998. Then, we match the sample firm with a control firm based on our matching criteria, i.e. industry, size-BV/MV or F-value. These matching procedures bring the sample down by more than 85% depending of the criteria. Furthermore, the final sample size decreases again due to monthly returns availability and varies from 1 to 11 observations on average. We replicate this procedure about 500 times in order to draw an empirical distribution and determine the empirical p-value. We limit our analysis to the unconditional and conditional hypothesis due to the extended data computation and programming required by this procedure.

The results found in Table 9 are consistent with our previous results, there is no significant results for the entire observation period regardless of the approach used. However, the only discrepancy found between the t-statistic and the p-value is for the pre-announcement period under the conditional hypothesis as reported in Panel B. The p-value approach invalidates the significance of the pre-announcement return under the Size and BV/MV approach. It is important to note that it was the only significant result found with the standard t-statistic. However, in general the t-statistic seems to be well specified and correct for the skewness bias. In future research, it might be interesting to calculate the p-value under alternative hypotheses such as the transaction types and the restricted hypothesis.

5.4 Comparative Results Between The Two Control Firms Approaches

Table 10: Comparative Results Between the Size and BV/MV and the F-Value Approaches.

Methodology / Hypothesis	Size and BV/MV	F-Value
Unconditional	No AR	No AR
Transaction Form	No AR	T+2 and T+3 AR for mergers
Restricted Unconditional	No AR	T+2 and T+3 AR
Conditional	T-1 AR	No AR
Transaction Form	T-1 AR for mergers	T+3 AR for mergers
Restricted Conditional	No AR	T-1 AR

* AR stated for significant Abnormal Returns

The results between the two methodologies are difficult to compare since they are very different and not robust across methodologies and hypotheses. The general conclusion is that there are no significant abnormal returns under the conditional or unconditional hypothesis regardless of the control firm

methodology used. The only exception is the 22.20% significant abnormal returns found under the conditional hypothesis of the Size and BV/MV approach. However, this result is invalidated using the empirical p-value instead of the standard t-statistic.

By stratifying the conditional sample according to transaction types, we found significant abnormal returns for the 3 year period following a merger under the F-value approach. Also, significant positive abnormal returns are found under the restrictive unconditional hypothesis for the 2 and 3 year period following the announcement date. In contrast, no significant abnormal returns have been found for the post-announcement period under the Size and BV/MV approach. However, significant positive abnormal returns have been found for the pre-announcement period. In general, our findings are different from Loughran and Vijh's (1997) results who found a non-significant negative abnormal return of 6.5% after 5 years. It is important to note that the fact that we add the industry group in our matching criteria might mitigate the results. Magenheim and Mueller (1988) found postmerger underperformance when the adjustment is made by using matched control firms in the same industry but Langetieg (1978) found that postmerger abnormal performance is not significantly changed.

Those results reveal two important issues. First, the sample under each methodology is very different. In fact, from the original sample of matches (364 and 234 matches for F-value and for Size and BV/MV methodology respectively), there are only 103 identical acquirers (or 133 transactions) in both samples. Also,

in both samples, there are 66 identical control companies but they are not matched with the same acquirer. Only 2 matches are identical in both samples (acquirer and control). This is quite surprising since Loughran and Vijh (1997) mentioned that they found similar results by controlling for Size and BV/MV in the spirit of Barber and Lyon (1997). Second, our findings reveal that the abnormal returns found are very sensitive to sample selection and measurement methodology. As argued by Fama (1998), all models for expected returns cannot completely describe the systematic patterns in average returns during any observation period. Frank, Harris, and Titman (1991) found that postmerger share-price performance is sensitive to the benchmark employed since opposite results are obtained using an equally-weighted index or a value-weighted benchmark. Mitchell and Stafford (2000) found that using different methods of constructing benchmark portfolios changes the estimated mean BHARs by roughly 20% in either direction. The presence or the absence of abnormal returns is not robust across the chosen methodologies and much of the mispricing related to an event can be attributed to a more general phenomenon with which the event firms happen to be correlated.

Because of the findings and counterfindings, it is difficult to conclude that shareholders do or do not benefit from mergers and acquisitions activities in the long run. It is clear that some mergers perform well and other do not and a tremendous amount of variables influence event returns. The true magnitude of the bidder's gains remains an important issue and future research most be done in this area.

6. Discussion and Conclusion

This study brings new insights on stock price performance of Canadian acquirers by empirically testing short- and long-term abnormal stock returns surrounding the announcement of a merger or an acquisition. Only a few Canadian studies have been published recently on this topic. Eckbo and Thorburn (2000) present evidence on gains to bidder firms in Canada by making a distinction between foreign and domestic bidders. Although the study has been recently published, the sample is quite old and compiled over a 20-year period from January 1964 until December 1982. Another study on Canadian acquisitions by Jabbour, Jalivand and Switzer (2000) has been recently published. However, this study focused on the pre-bid price run-ups in target shares and insider trading activity. Hence, our study is the first one which empirically tests both the short term and the long-term returns of Canadian bidders for a recent observation period (January 1988 to December 1998).

In this study, we wanted to answer several questions. Do merger events provide positive or negative abnormal returns to the bidders in the short run? Do long-term acquirer's shareholders benefit from mergers and acquisitions? Although our results are mixed, a few interesting conclusion can be drawn.

First, no significant abnormal returns appear in the days surrounding an announcement. These results are robust to alternative hypothesis such as transaction types and stock liquidity. The results suggest that merger bids are, on average, zero net present value investments. Few hypothesis might explain the

absence of significant results: investors do not value the merger signal, the positive signal offset the negative one, or the stock price already incorporated the event information due to a leakage of information. One issue that complicates event studies analysis arises from leakage of information which leads to attenuated estimates of the total returns to bidder firms.

The short-term results are very interesting when compared to our long-term results. It is difficult to formulate one single conclusion since the results are not robust to the benchmark methodology used and to alternative hypotheses. Using Size and BV/MV control firm approach, no significant abnormal returns are found under the unconditional hypothesis. However, by limiting our sample under a conditional hypothesis, interesting results are found. Significant pre-announcement positive abnormal returns of 22% for the entire sample and 35% for the merger subset are found. Those results help us to explain the absence of short-term abnormal returns surrounding the announcement date. Indeed, the leakage of information hypothesis is validated since the stock market positively reacted for 12 months preceding the announcement date. For the post-announcement period, non-significant positive abnormal returns are found. The conditional hypothesis also may introduce a bias since we kept in the sample only the companies with four years of valid returns. It is important to note that using an empirical p-value instead of the standard t-statistic invalidate the presence of pre-announcement abnormal returns (22%) for the entire sample.

Very different results are found using the F-value approach. Under the unconditional hypothesis, although the pre-announcement BHAR are highly positive, they are not significant from a statistical standpoint. However, the hypothesis that the positive skewness of the sample leads to a downwardly biased test statistic and then explain the non-significance of the results is invalidated. Indeed, the empirical p-value adjusted for skewness shows also non-significant abnormal returns. For the post-announcement period, significant positive abnormal returns appear 2 and 3 years following the announcement date for the merger (84% and 97%) and restricted (75% and 63%) subsets. A possible explanation for these results might be that it takes few years to investors to notice the gains from the operating synergies. Under the conditional hypothesis, the results are similar. However, the results show a significant abnormal return of 36% for the pre-announcement period of the restricted subset and a significant positive abnormal return of 113% for the three year post-announcement period of the merger subset.

7. Direction For Future Research

Obviously, our results bring new questions and suggestions for further research in this field of interest. In the short-run event study, it might be interesting to test several longer event windows in order to detect when the majority of the disclosure of the information takes place. The assumption that we draw in accordance with our findings is that leakage of information takes place several months before the announcement date as showed by the significant run-ups period and as documented in Jabbour, Jalivand and Switzer's (2000) article. Also, it might be interesting to extend up to five-years the long-run observation period as done by Loughran and Vigh (1997). Using the control firm approach, Lougrhan and Vigh (1997) found non-significant negative abnormal returns of 6.5% after 5 years. The authors justify the length of the observation period by the fact that the effect of restructuring decisions related to the corporate event should take a few years. In fact, we do not know if a three-year observation period is sufficient and it might explain, for most of our samples, the absence of significant post-announcement abnormal returns.

Besides the length of the observation period, the computation of abnormal returns and the determination of a proper benchmark play a key role in long-term performance study. For the calculation of the long-run abnormal returns, we use the BHAR instead of the CAR or the CTAR approaches. It might be interesting in future research to use the CAR or the CTAR in order to determine the impact of the choice of the methodology on our results. However, Mitchell and Stafford (2000) favoured the use of the CTAR over any other methods but they use a

portfolio approach instead of a control firms approach. For the determination of the benchmark, we favoured the control firm approach rather than any other approaches (reference portfolio or Fama-French three factor model) since the control firm approach eliminates most of the bias introduced by the buy-and-hold abnormal return calculation. Each method has their pros and cons and its is difficult to determine the most appropriate one, especially for the Canadian market, since few studies have been done so far on this topic.

Finally, as discussed by Eckbo and Thorburn (2000), Canadian bidder announcement returns are, on average, greatest for the bidders with the smallest equity size relative to the target and the smallest Canadian bidders have the greatest average announcement returns. Hence, it would be interesting to test this relationship with a more recent sample. These recommendations for future research might help to find the true magnitude of the bidder gains, especially in a Canadian context.

8. References

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9. Appendix

Appendix I

Table A: Distribution of the Initial Sample under the Size and BV/MV Approach

Announcement year	Transactions per year	Transaction per year in %
88	4	1,71%
89	1	0,43%
90	3	1,28%
91	5	2,14%
92	14	5,98%
93	14	5,98%
94	30	12,82%
95	38	16,24%
96	70	29,91%
97	35	14,96%
98	20	8,55%

Table B: Distribution of the Initial Sample per Industry Group

Industry Group	Per Group	% Per Group	Industry Group	Per Group	% Per Group
11	3	1,28%	56	2	0,85%
13	25	10,68%	70	9	3,85%
14	1	0,43%	71	4	1,71%
18	149	63,68%	75	2	0,85%
21	2	0,85%	77	1	0,43%
26	10	4,27%	79	3	1,28%
31	3	1,28%	80	3	1,28%
37	2	0,85%	81	4	1,71%
43	1	0,43%	83	1	0,43%
46	2	0,85%	85	4	1,71%
47	1	0,43%	98	1	0,43%
50	1	0,43%	**Total**	**234**	**1**

Table C: Distribution of the Initial Sample under The F-value

Announcement year	Transactions per year	Transaction per year in %
88	11	3,02%
89	15	4,12%
90	14	3,85%
91	20	5,49%
92	18	4,94%
93	49	13.46%
94	37	10,16%
95	47	12,91%
96	65	17,58%
97	49	13,46%
98	39	10,71%

Table D: Distribution of the Initial Sample per Industry Group under the F-Value Approach.

Industry Group	Per Group	% Per Group	Industry Group	Per Group	% Per Group
10	2	0,55%	47	5	1,37%
11	12	3,30%	50	5	1,37%
13	65	17,86%	52	2	0,55%
14	6	1,65%	56	5	1,37%
16	1	0,27%	57	8	2,20%
18	123	33,79%	60	2	0,55%
21	10	2,75%	70	13	3,57%
23	1	0,27%	71	9	2,47%
26	13	3,57%	75	6	1,65%
31	12	3,30%	77	4	1,10%
34	1	0,27%	79	6	1,65%
36	6	1,65%	80	3	0,82%
37	4	1,10%	81	13	3,57%
42	1	0,27%	83	3	0,82%
43	1	0,27%	85	9	2,47%
44	1	0,27%	98	4	1,10%
46	5	1,37%	**Total**	**364**	**1**

Appendix II

Basic Hypothesis for the Long Term Analysis

For both the unconditional and conditional hypothesis, we replace the missing monthly returns by zero and we filled the missing returns with the control firms' returns for the delisted acquirers.

Unconditional

The unconditional hypothesis applies no limitation to the original sample, i.e. the sample size varies from one period to another due to delisted companies and missing returns.

Conditional

The conditional hypothesis, required that the monthly returns must be available for the entire four year observation period (pre- and post-announcement period). All the firms with an announcement date in either 1997 or 1998 (since the monthly returns retrieved from the TSE Western Database were available only up to December 31st, 1999) and all the control companies delisted before the end of the observation period have been excluded.

Restricted (Unconditional or Conditional)

We test the abnormal returns on a restricted basis i.e. without filling the missing returns or substituting the delisted companies with the control firms' returns.

Transaction Types (Unconditional or Conditional)

The sample is divided into three subsets based on the transaction types, i.e. mergers and acquisitions, acquisition of major interests and acquisition of partial interests.