

The Long Term Performance of Acquiring Firms: A Re-examination of an Anomaly

Abstract

In this paper, we investigate the long-term stock return performance of Canadian acquiring firms in the post event period by using 1300 M&A events in the 1993-2002 period. We use both event-time and calendar-time approaches and conduct robustness tests for benchmarks, methodological choices, statistical techniques and other related factors such as payment methods. We also assess the role of governance variables. Contrary to stylized facts reported in U.S. studies, neither do we find negative abnormal long-term abnormal stock market returns once we account for methodological discrepancies nor do we find negative long-term operating performance in the post-acquisition periods for the acquirer following an acquisition event. We also find that the Canadian market reacts positively to acquisition announcements but corrects for this reaction within a short period of time. Overall we find that Canadian acquisitions do not show value destruction or overpayment.

JEL Classification: G14, G34

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1. Introduction

Over the last two decades Mergers and Acquisitions (M&A) related issues have drawn considerable interest from practitioners and academics. As a result, scores of empirical studies have documented various aspects of M&A activity including trends in M&A activity, and characteristics of the transactions and corresponding gains or losses to shareholders. While a majority of the existing empirical evidence focuses on the stock returns immediately surrounding announcement dates, a smaller body of research has examined long-run post acquisition returns. Most of these long-term studies based on U.S. data conclude that acquiring¹ firms experience significant negative abnormal returns over one to three years after the merger ([Agrawal et al., 1992](#); [Asquith, 1983](#); [Andrade et al., 2001](#); [Gregory 1997](#)), which somewhat questions the notion of market efficiency. However, since the basic goal of management is to maximize shareholders wealth, such consistent findings of negative performance require careful analysis before concluding that management has other reasons (along the lines of managerial wealth maximisation to acquire companies), or that they systematically overpay for acquisitions and are immune to shareholder discipline.

However, prior to making any such conclusions, it should be noted that many of these empirical studies resort to different methodological choices (event time vs. calendar time approach) and various factors (such as payment methods, merger or tender offer) that may affect the outcome of these findings as noted by [Fama \(1998\)](#) and [Mitchell and](#)

¹ In this study we use 'bidder' and 'acquirer' interchangeably, as we consider only the completed deals in the study.

Stafford (2000). Moreover, many of these studies are based on overlapping U.S. data. Since this often reported stylized fact is somewhat puzzling in the context of the neo-classical notion of efficient capital and labour markets, we are motivated to undertake this study using data on Canadian acquiring firms. We use a comprehensive list of 1,300 acquisition events during the period of 1993-2002 and use both event-time and calendar-time approaches to analyze the long-term post-acquisition stock performance of acquiring firms.

Our results show that there are no significant long-term negative abnormal returns for Canadian acquirers, once we correctly account for methodological discrepancies. Our results are robust across factors including: (i) mode of acquisition (tender or merger), (ii) target type (public or private), (iii) related or unrelated target, (iv) payment type (stock, cash or mixed), (v) growth or value acquirer, (vi) board independence, (vii) level of managerial ownership, and (viii) relative size of the deals.

Our study contributes to the literature in several ways. First, in this study we examine Canadian acquiring firms, and thus present out-of-sample evidence with a different M&A market set-up, which, due to the size of the public sector companies, may have some rent seeking or efficiency increasing opportunities. We take the view that a difference in the size of the economy and capital market and regulatory environment could lead to different results. For example, one of the most important differences in these two countries is the form of M&A antitrust regulation. Antitrust regulation is stricter, more developed, and less favorable to acquiring firms in the U.S. than in Canada. While in the U.S., courts may proceed against acquisitions on market concentration grounds alone, “section 92(2) of the Competition Act (of Canada) expressly prohibits a

finding of merger harm – i.e., a substantial lessening of competition – solely on the basis of concentration or market share” (Green, 1993, p. 193). Unlike in the U.S., the prevailing view in Canada is that majority shareholders do not generally owe a fiduciary duty to the minority shareholders (Braithwaite and Ciardullo, 2004). Furthermore, compared to Canadian firms, U.S. firms more frequently adopt anti-takeover strategies such as shareholder’s rights plan, poison pills, and shark repellent. In Canada, anti-takeover plans are typically rendered ineffective by the securities commission(s) at the request of the bidder (Brealey et al., 2006). In addition, there are other significant differences between Canada and the U.S. For example, in Canada, firms have more concentrated ownership than do U.S. firms and the use of multiple voting shares and pyramidal structures is more prevalent (King and Santor, 2007). Also, cash payments represent the majority of Canadian acquisitions, whereas stock payments represent the majority of U.S. deals (Eckbo and Thorburn, 2000; Loughran and Vijh, 1997). Such differences between the U.S. and Canadian markets could affect the target selection process, the propensity of M&A activities, and market reactions which might lead to different performance outcomes.

Second, we pay considerable attention to the methodological issues that have been noted to have significant influence on the findings. We take the view that any results showing long-term abnormal returns must be consistent across different methodological choices. Accordingly, we use both an event-time approach (buy and hold abnormal return) and a calendar-time approach (F-F three factor regression) to mitigate methodological problems in our study. Very few studies use both approaches to examine the long-term stock performance results. Of these two methods, most criticisms are

directed at the event-time approach. Accordingly, we have taken the following steps to account for serious criticisms with respect to the buy and hold abnormal return (BHAR) approach: (i) we use matching firm returns as a benchmark (Barber and Lyon, 1997) along with other benchmarks, (ii) we use skewness adjusted t -statistics (Lyon et al., 1999); and (iii) we make adjustments for cross-sectional dependence in the test statistics (Mitchell and Stafford, 2000). In the case of F-F three factor regression approach (calendar-time), we take the following steps: first, we use three different samples with (i) all cases, (ii) non-overlapping² cases, and (iii) overlapping³ cases to isolate the effect of cross-sectional dependence. Second, we use the weighted least square (WLS) procedure to account for acquisition activity weights in different months and to mitigate the potential heteroskedasticity problem⁴. As stated earlier, we further investigate the robustness of the results by examining the impact of a set of deal and firm-specific factors (such as corporate governance of acquiring firms and target type) on the long-term abnormal returns of acquiring firms. This variety of methodological choices as well as consideration of various factors used in this study reinforces the robustness of the findings of this study.

Third and quite importantly, we check the consistency of our results with respect to short-term market reactions to an acquisition event around the announcement date and long-term operating performance. Earlier studies that report long-term abnormal returns assume that the market gradually reassesses the quality of acquiring firms as the results of

² If a firm makes acquisitions within three years of a previous acquisition, the cases were considered ‘overlapping’ and deleted from this sample.

³ Cases when a firm makes one or more acquisitions within three years of a previous acquisition.

⁴ However, there was no significant difference in result whether or not we considered WLS methodology while using value weighted returns. Further, Mitchell and Stafford (2000) have shown that WLS methodology is not efficient in mitigating the heteroskedasticity problem.

the acquisition become more clear (Rau and Vermaelen, 1998). However, according to the market efficiency hypothesis, the market should correct any over-reaction or under-reaction within a short period of time. We examine this issue by calculating daily and cumulative abnormal returns subsequent to the announcement date. Our results show that initial overreactions in the Canadian market are followed by negative corrections (i.e. negative abnormal returns) in the market and cumulative abnormal returns become insignificant within 15 days of an announcement date. This result is consistent with our long-term stock performance outcomes that do not show any abnormal negative returns during the three years after the effective date of an acquisition. Furthermore, we investigate the basis of long-term reassessment by evaluating the long-term operating performance of the acquiring firms. We do this by using a matching firm technique in the pre- and post-event periods. Our results show that there is no significant difference between three-year post-acquisition and three-year pre-acquisition operating performance of Canadian acquiring firms. This result is again consistent with our long-term stock performance outcomes.

Fourth, we believe that our study is the most comprehensive study of the recent Canadian M&A environment. Despite a vibrant M&A activity in Canada, studies examining the long-term stock performance of Canadian acquiring firms are scarce⁵. Strictly speaking, there are only two studies in this area.⁶ Eckbo and Thorburn (2000) report the performance of domestic and U.S. bidder firms acquiring Canadian targets. The study considered 1,261 Toronto Stock Exchange (TSX) listed bidders and 394

⁵ As reported by Crosbie & Co., a Toronto-based merchant bank, the total transaction value of the announced deals during 2006 was \$257 billion with 1,968 deals.

⁶ There are two other recent studies by Yuce and Ng (2005) and Ben-Amar and Andre (2006) which focus on short term results only.

NYSE-listed bidders, but the sample period is relatively old (1964-1983). Though the main focus of the study was to investigate abnormal returns around the announcement date, it also investigated the 12-month post announcement period abnormal returns of the bidding firms. The study reported a decline in stock return performance in the post 12-month period (both for Canadian and U.S. bidders), but the results were not statistically significant. A more recent study is by [Andre et al. \(2004\)](#) who investigated the long-term performance of Canadian acquirers and reported significant underperformance with a very limited sample size (143 events for non-overlapping stocks). Furthermore, they use only calendar-time methodology and the results are not validated with acquiring firms' changes in operating performance in the post-acquisition periods. They also use Fama-French factor returns (namely SMB and HML in Canadian context) that are not publicly available; therefore it is not clear whether their results are due to small sample size as well as their construction of factor returns. Our study thus fills a large gap in the Canadian literature.

The remainder of the paper is organized as follows: [section 2](#) presents the literature review, [section 3](#) presents data and methodology, [section 4](#) includes results and discussions, and finally, [section 5](#) presents summary and conclusions.

2. Literature Review

Since our main focus is on the long term performance of acquiring firms, we only briefly touch on the voluminous event study based literature that focuses strictly on the short-term performance of target and acquiring firms around the announcement dates. Long-term performance studies are limited, though the literature is growing. [Agrawal and](#)

Jaffe (2000) have presented a detail review of past influential studies on the long-term post acquisition performance of acquiring firms and critically analyzed the results. They concluded that, “in our opinion, the work starting with Franks et al. (1991) shows strong evidence of abnormal under-performance following mergers. Except for Franks et al. (1991) itself, each paper shows at least some evidence of under-performance” (p. 50). We do not intend to repeat their work here and only present a summary of relevant studies below (Table 1):

Insert Table 1 About Here

As can be seen, most of the studies (dominated by U.S. and many with overlapping sample periods) presented in Table 1 report negative long-term abnormal returns. However, two issues are worth mentioning with respect to these studies. First, introduction of Buy-and-hold methodology contributed to a great deal of controversy in the reported results. Loughrun and Vijh (1997) have used BHAR (Buy and Hold Abnormal Return) technique for the first time in this area but also reported a significant negative long-run abnormal return following M&A. A number of studies have reported similar negative results using BHAR methodology. However, once the biases in BHAR methodology were corrected, the long-term abnormal returns were found not to be statistically significant, as reported by Mitchell and Stafford (2000). Second, studies using a comprehensive set of benchmarks and methodologies generally presented inconclusive evidence or no abnormal returns. That is, these studies did not support the view of long-term underperformance of acquiring firms. For example, Franks et al. (1991) used four benchmarks in their study (the CRSP equally weighted index, the CRSP value weighted index, a ten-factor model provided by Lehman and Modest (1987), and an

eight-portfolio model from [Grinblatt and Titman \(1989\)](#). They found different results with different benchmarks and concluded that the observation of long-term underperformance is likely due to benchmark errors. In a similar spirit, [Fama \(1998\)](#) investigated a set of past studies that examined the long-term abnormal performance following a corporate event (such as IPO, mergers, stock-split). He dismissed any systematic claim of long-term abnormal returns and concluded that “consistent with the market efficiency hypothesis that the anomalies are chance results, apparent overreaction of stock prices to information is about as common as under-reaction. And post-event continuation of pre-event abnormal returns is about as frequent as post-event reversal” (p. [304](#)). Notwithstanding such arguments, evidence of negative long-term underperformance as presented in some of the detailed and careful studies (such as [Rau and Vermaelen, 1998](#)) remains a puzzle.

A smaller set of other studies examined the impact of a number of deal and firm-specific factors on acquiring firms’ abnormal returns. Rationale behind these factors and the relevant empirical evidences are briefly discussed below.

2.1 Methods of Payment

[Myers and Majluf \(1984\)](#) argued that a bidder firm would use stock as the medium of exchange if the board believes that its own shares are overvalued. Alternatively, if the firm is convinced of its current valuation, it might offer cash in order to send a positive signal to the market. As a result, the market will view a cash offer more favorably than a stock offer ([Travlos, 1987](#); [Fuller et al., 2002](#)). Also, if the bidder is uncertain about the target’s value, the bidder may not want to offer cash since the target

will only accept a cash offer greater than its true value and the bidder will have overpaid (Fuller et al., 2002). Loughran and Vijh (1997), Dodds and Quek (1985) and Gregory (1997) found that the long-run abnormal return is higher for bidding firms' shareholders in the case of cash offers in comparison with stock offers. However, Franks et al. (1991) did not find any significant difference in abnormal returns for different methods of payments.

2.2 Merger or Tender offer

Agrawal and Jaffe (2000) have argued that mergers and tender offers should be analyzed separately as they could have different implications for bidding firm performance. Tender offers are different from mergers in that in the case of tender offers, acquiring firms bid for target shares in the open market, typically considered as hostile and often with a cash offer (Rau and Vermaelen, 1998). On the other hand, mergers occur through discussion between the management of the bidding firm and the target firm, are usually friendly, and are generally done through a share offer (Loughran and Vijh, 1997; Martin and McConnell, 1991). It is argued that more efficient managers are appointed for the acquired companies while acquired through tender offers, which lead to wealth gains. In general, past studies have reported a better long-term stock return performance for tender offers (Agrawal et al., 1992; Loughran and Vijh, 1997; Rau and Vermaelen, 1998).

2.3 Related (non-conglomerate) and Unrelated (conglomerate) Acquisitions

A merger is defined as non-conglomerate if an acquirer and its target are in the same industry. It is generally claimed that conglomerate mergers are less likely to

succeed because managers of acquiring firms are not familiar with the target industry, or they waste free cash flow on bad acquisitions (Agrawal et al., 1992; Jensen, 1986). Also, shareholders do not prefer that the bidding company managers diversify their operations as shareholders can rebalance and diversify their portfolio by themselves by investing in different types of assets. Therefore, diversification through acquisition is likely to be viewed negatively in the market. Agrawal et al. (1992) examined this issue by calculating the cumulative average abnormal return of acquiring companies for conglomerate and non-conglomerate acquisitions after adjusting for both firm size and beta. Contrary to popular belief, they find that the underperformance of acquirers is worse in non-conglomerate mergers than in conglomerate mergers.

2.4 Growth and Value Firms

Rau and Vermaelen (1998) argued that in companies with high market-to-book ratios (termed “glamour” firms), managers are more likely to overestimate their own abilities to manage an acquisition, i.e., they will be infected by hubris (Roll, 1986). Indeed, glamour firms are firms with high past stock returns and high past growth in cash flow and earnings (Lakonishok et al., 1994); this should presumably strengthen management’s belief in its own actions. Moreover, other shareholders in these firms, including the board of directors and large shareholders, are more likely to trust the management’s decision and approve its acquisition plans. On the other hand, in the companies with low market-to-book ratios (“value” firms), managers, directors, and large shareholders may be more prudent before approving a major transaction that could determine the survival of the company. Rau and Vermaelen (1998) empirically examined

this issue with US data and reported long term abnormal returns over three years after the completion of a merger or tender offer. They found that value acquirers earn statistically significant positive abnormal returns of 8% in mergers and 16% in tender offers, while glamour acquirers earn statistically significant negative abnormal returns of -17% in mergers and insignificant abnormal returns of 4% in tender offers.

2.5 Type of Target Organization (Public, Private and Subsidiaries)

It has been pointed out that bidders acquire targets for a better price when they buy a nonpublic firm as compared to a public firm, resulting in a better return for the acquiring firms' shareholders in the former case. The following two reasons are cited to support this observation. The first is attributed to the liquidity impact and level of competition for a target firm. Private firms and subsidiaries cannot be bought and sold as easily as publicly traded firms. This lack of liquidity makes these investments less attractive and hence offers are generally less for private firms. This gives a better return to bidding firm's shareholders (Fuller et al., 2002). The second reason is tied to the governance (monitoring) aspect of an acquiring firm. Firms acquiring privately held targets through common stock exchanges tend to create outside blockholders as the targets are owned by a small group of shareholders (Chang, 1998). The creation of outside blockholders can serve as an effective monitor of management and, in turn, can increase bidder value (Chang, 1998; Fuller et al., 2002; Shleifer and Vishny, 1986). However, few studies have investigated this issue in the context of short-term stock return performance of acquiring firms; we could not find any study that examine the relationship between target type and acquirers' long-term performance.

2.6 Relative Size

The acquisition of a relatively large target is likely to be a more important economic event for the acquirer than the acquisition of a relatively small target (Eckbo et al., 1990). Higher relative size could bring in more synergy (positive effect). Alternatively, it could be more difficult to manage a larger target company (negative effect). Also, as the size of target increases, it will have greater bargaining power and the acquisition will become more expensive for the acquiring firm. Only few studies have investigated this issue in the context of short-term stock return performance of acquiring firms and studies relating relative size and long-term stock performance are scarce.

2.7 Governance Characteristics

It has been argued that governance mechanisms can contribute to better firm performance — although we do not see any definitive consensus in empirical results presented in different studies. Commonly cited governance mechanisms that may influence abnormal returns of the bidding firms around the announcement period include board independence (more outsider directors, and separation of CEO and board chairperson position), managerial ownership, blockholder ownership, and CEO pay. In this study we investigate the impact of managerial ownership and board independence only. Earlier studies such as Berle and Means (1932) and Jensen and Meckling (1976) pointed out that the level of managerial ownership is a potential source of agency problem. If managerial ownership is too low, their interest will not be aligned with that of other shareholders. As a result, management may make decisions that are not in the best

interests of shareholders. On the other hand, if management has considerable ownership in the firm, they may be more careful in making a decision that is more favorable for the existing shareholders as the increased level of managerial ownership would align management's interest with that of shareholders' (Fama and Jensen, 1983; Subrahmanyam et al., 1997). This would lead to better managerial decisions. However, some studies have argued and showed that such relationship might not be monotonic (Morck et al., 1988). In the context of board structure, it is expected that an independent board (a majority of independent directors and an unrelated board chair) would lead to greater monitoring of the bidding firm's management which in turn is likely to result in better decisions from the shareholders' perspective. Similarly an unrelated chairman of the board is likely to take more objective decisions in line with shareholders' interests. However, few studies have investigated this issue in the context of short-term stock return performance of acquiring firms, we could not find any study that examined the relationship between governance characteristics and acquirers' long-term performance.

As can be seen, many conjectures/theories are proposed in the literature to have potential influence on empirical findings and thus need to be accounted for in empirical studies. However, one may argue that these factors would influence the short term returns around the announcement date and the stock price will be adjusted accordingly in the short-run. As a result, there should not be any systematic long term stock market underperformance (or overperformance) for the acquiring firms.

3. Data and Methodology

3.1 Data

This study considers all Canadian M&A deals that occurred between 1993 and 2002 and involved a TSX-listed bidding company. We obtain our dataset from the SDC Thomson Financial Database. Our data meet the following criteria: (i) the deals were completed, (ii) the acquiring firm was not from the financial industry, (iii) acquiring firms with multiple acquisitions during 1993-02 period were considered, (iv) deals with all sizes of transaction value were considered⁷. Stock return data was collected from the CFMRC (Canadian Financial Market Research Center) database. Accounting information was collected from the StockGuide database. Information related to governance variables was manually collected from firms' annual reports and management information circulars (for 1997-2002 periods).

Descriptive statistics of the sample are presented in [Table 2 \(Panel A and Panel B\)](#) and [Table 3](#). Some of the important observations are as follows: (i) in line with the overall Canadian merger and acquisitions (M&A) activities, we see an increase in M&A deals between 1996 and 2000 but a decline in the post 2000 period but with much larger individual deal sizes. (ii) Most of the acquirers (757 out of 968 acquiring firms) are single acquirers (that is, made only one completed deal in a calendar year); the rest of the firms made more than one acquisition in a given year. (iii) Most of the deals are in minerals, manufacturing, and service industries consistent with the industrial landscape in Canada.

[Insert Table 2 About Here](#)

⁷ Out of 1300 events considered in the study, only 88 cases have transaction values less than \$1 million CDN.

In terms of the characteristics of the offers, we find that (Table 3) there are significantly higher number of (a) merger offers than tender offers, (b) pure cash transactions than share swaps, and (c) growth acquiring firms⁸ than value acquiring firms. These deal characteristics are quite different from U.S. M&A deals. We also find that a majority of acquisitions can be termed as unrelated acquisitions.

Insert Table 3 About Here

3.2 Methodology

For long-term stock return performance analysis, we investigate 3-year stock return performance in the post event period starting from the effective date of a completed deal (similar to Mitchell and Stafford, 2000). We use both the event-time approach (buy and hold abnormal return) and calendar-time approach (F-F three factor regression) to mitigate methodological problems in reporting our results. Of these two methods, most criticisms are directed at the event-time approach (Mitchell and Stafford, 2000).

3.2.1 Event-Time Approach: Buy and Hold Abnormal Return (BHAR)

This approach has become increasingly popular since the end of the 1990s. Proponents of this approach argue that BHAR depicts the investors' behavior in a better way. The buy-and-hold abnormal return (BHAR) has been defined as the return on buy-and-hold investment in the sample firm less the return on a buy-and-hold investment in an asset/portfolio with an appropriate expected return:

⁸ We define a growth-acquiring firm as the acquiring firm with price-to-book value of more than 1 in the preceding year of an acquisition.

$$BHAR_{it} = \prod_{t=1}^{\tau} [1 + R_{it}] - \prod_{t=1}^{\tau} [1 + E(R_{it})] \dots\dots\dots(1)$$

Expected return, $E(R_{it})$, in Equation 1, is calculated in two ways: by using (i) a Reference portfolio return (such as market index return), and (ii) control firm return (such as a matching firm based on size and book to market value ratio). To test the null hypothesis that the mean cumulative abnormal returns are equal to zero for a sample of ‘N’, the common parametric test statistics used is:

$$t_{BHAR} = \overline{BHAR_{it}} / (\sigma(BHAR_{it}) / \sqrt{N}) \dots\dots\dots(2)$$

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’ firms⁹.

As reported by Barber and Lyon (1997), BHAR with reference portfolio is subject to a new listing bias, a skewness bias, and a rebalancing bias. Subsequently, Lyon et al. (1999) have presented the following skewness adjusted ‘t’ statistics to test the null hypothesis of abnormal return.

$$t_{sa} = \sqrt{N} (S + \frac{1}{3} \hat{\gamma} S^2 + \frac{1}{6N} \hat{\gamma}) \dots\dots\dots(3)$$

Where,

$$S = \frac{\overline{BHAR_{it}}}{\sigma(BHAR_{it})}, \quad \text{and} \quad \hat{\gamma} = \frac{\sum_{i=1}^N (BHAR_{it} - \overline{BHAR_{it}})^3}{N \sigma(BHAR_{it})^3}$$

The control firm approach eliminates the new listing bias (since both the sample and control firm must be listed in the identified event month), the rebalancing bias (since both the sample and control firm returns are calculated without rebalancing), and the

⁹ In the case of value-weight BHAR, we use market value weighted average BHAR and corresponding standard deviation in the t-statistics.

skewness problem (since the sample and the control firms are equally likely to experience large positive returns). However, neither reference portfolio approach nor control firm approach accounts for cross-dependence among acquisition events which poses a serious problem to event-time based long-term performance methodologies such as BHAR. As [Brav \(2000\)](#) argued, cross-correlation in abnormal returns considered in long-term event studies cannot be ignored, even if the event is not clustered in calendar time. [Kothari and Warner \(2005\)](#) stated that “long-horizon abnormal returns tend to be cross-correlated because: (i) abnormal returns for subsets of the sample firms are likely to share a common calendar period due to the long measurement period; (ii) corporate events like mergers and share repurchases exhibit waves; and (iii) some industries might be over-represented in the event sample (e.g. merger activity among technology stocks)” (p. 33, 34). Test statistics in the event-time studies that ignore cross-dependence in data will produce overstated test statistics and will lead to serious misspecification of test ([Kothari and Warner, 2005](#); [Mitchell and Stafford, 2000](#)). Consequently, we have adopted the correction procedure employed by [Mitchell and Stafford \(2000\)](#) for the adjustment of cross-sectional dependence in BHAR test statistics:

$$\frac{\sigma_{BHAR}(independence)}{\sigma_{BHAR}(dependence)} \approx \frac{1}{\sqrt{1 + (N - 1)\overline{\rho_{i,j}}}} \dots\dots\dots(4)$$

Where, N = number of sample events, and $\overline{\rho_{i,j}}$ = average correlation of individual BHARs¹⁰. Table A1 of appendix A presents the detailed calculation of average correlation coefficient.

¹⁰ For detailed procedure, please refer to [Mitchell and Stafford \(2000\)](#).

In the light of above discussion, we have used three benchmarks in the BHAR analysis. Each test statistic is also corrected for skewness and cross-sectional dependence.

The three benchmarks are as follows:

Benchmark 1: TSX 300 index return.

Benchmark 2: Value weighted CFMRC (Canadian Financial Market Research Center) index returns respectively. CFMRC is the Canadian equivalent of CRSP database.

Benchmark 3: A portfolio consisting of matching firms. In order to select a matching firm we follow a two-stage procedure. First, we identify the TSX firms that have not made any acquisition during 1992 to 2003. Second, we perform OLS regression considering all acquiring firms and matching firms using the firms' return on equity on firm size and market to book value variables (Loughran and Vijh, 1997). Matching firms were selected based on the nearest propensity score obtained by using the coefficients of firm size and price to book value factors.

Of these three benchmarks, we believe that benchmark number three is the best benchmark as it eliminates new listing, rebalancing and skewness bias (Barber and Lyon, 1997). Furthermore, the cross-sectional dependence correction makes the test statistic for benchmark three more reliable. The other two benchmarks (TSX index return and CFMRC index return) are still plagued with 'a new listing bias' and 'a rebalancing bias' and the reported results are likely to suffer from benchmark errors.

3.2.2 Calendar-Time Portfolio Approach: Fama-French (FF) 3-Factor methodology

In this approach, we first calculate monthly calendar-time portfolio returns for firms experiencing an event. Subsequently, we calculate the monthly abnormal return by estimating the intercept of calendar-time portfolio returns against predetermined factor returns. In the same spirit, we use the [Fama and French \(1993\)](#) three-factor model as presented below¹¹.

$$AR_{it} = R_{it} - R_{ft} - \beta_{i1}(R_{mt} - R_{ft}) - \beta_{i2}HML_t - \beta_{i3}SMB_t \dots\dots\dots(5)$$

Where, AR_{it} is the monthly abnormal return of the calendar-time portfolio. In the literature, this abnormal return is also popularly termed as ‘alpha’. β_{i1} , β_{i2} , and β_{i3} are estimated by regressing security “ i ’s” monthly excess returns on the monthly market excess returns, book-to-market, and size factor returns for the estimation period. HML_t and SMB_t are the Fama-French book-to-market and size factor returns. HML_t is the high-minus-low book-to-market portfolio return in month “ t ” and SMB_t is the small-minus-big size portfolio return in month “ t ”. Fama-French factors (namely SMB and HML) are not readily and publicly available for Canadian market. We have used relevant information from MSCI-Barra firm¹² (a highly reputed investment firm) website to construct Fama-French SMB and HML factors in Canadian context. MSCI-Barra uses similar methodologies as of Fama and French in developing monthly index returns for high growth, low growth, small size and large size Canadian firms. We use these monthly index returns and generate SMB and HML factor returns for the study period.

¹¹ [Carhart \(1997\)](#) has introduced a fourth factor (momentum factor) to this model.

¹² Please refer to <http://www.msccibarra.com/> for detail index information and monthly return calculation.

As [Fama \(1998\)](#) and [Mitchell and Stafford \(2000\)](#) have pointed out, there are a few distinct advantages of this methodology over BHAR. Since we develop portfolios with monthly calendar-time returns, in this approach all cross-correlations of event firms are automatically taken into account. Further, distribution of calendar-time monthly returns presents a better approximation for the normal distribution¹³.

4. Results and Discussions

In this section, we describe the results for long-term stock return performance subsequent to an acquisition event. We first describe the results for all acquisition events between 1993 and 2002 using the event-time approach (BHAR methodology) and the calendar-time approach (Fama-French (F-F) three factor methodology). Subsequently, we present the results for the implications of various deal specific and firm specific factors on long-term return performance.

4.1 Long-term Return Performance for an Acquisition Event

4.1.1 Event-Time Approach: Buy and Hold Abnormal Return (BHAR)

[Table 4](#) presents the results for value-weighted BHAR analysis for all acquiring firms between 1993 and 2002. We use three different benchmarks to calculate BHAR and to illustrate the differences in results with respect to benchmark choice. We see that long-term abnormal return results differ significantly with respect to both methodological and

¹³ [Loughran and Ritter \(2000\)](#) pointed out that calendar-time portfolio approach weights each period equally thus ignores the time-varying misvaluation behavior of corporate managers. In mitigating such problem, [Fama \(1998\)](#) advocated weighting calendar month portfolio returns by sample size. Some studies have suggested that such weighting procedure might also alleviate the problem of heteroskedasticity. In this study we used the weighted least square (WLS) procedure to account for acquisition activity weights. There was no significant difference in results whether or not we use considered WLS methodology using value-weighted returns.

benchmark choice. For the discussion of our results, we primarily focus on BHAR3 (matching firm benchmark) results with adjusted t -statistics since this method is subject to the least criticism. This method (i) considers the appropriate benchmark with size and price to book value adjusted matching firm return and (ii) accounts for skewness and cross-sectional dependence¹⁴. Our results show that BHAR3 is 0.001 (or 0.1%). That is, long-term stock performance of an acquiring firm is almost similar to that of a matching firm over three years from the effective date of an acquisition. Not surprisingly, t -statistics of 0.069 and adjusted t -statistics of 0.011 (adjusted for skewness and cross-sectional dependence) indicate statistical insignificance. We make adjustments for cross-sectional dependence along the lines of Mitchell and Stafford (2000) and find identical results (see Appendix A).

Insert Table 4 About Here

We also find that BHAR3 results differ quite significantly from BHAR1 and BHAR2 results. BHAR1 and BHAR2 use market indices as benchmarks. As pointed out earlier, use of market indices as benchmarks induces “rebalancing” and “new listing” biases in BHAR results. As a result, BHAR results with these benchmarks would produce incorrect results and are likely to show underperformance for acquiring firms even if there is no such underperformance. Further, the market index benchmarks ignore size and book-to-market value factors while comparing the returns and conventional BHAR methodology ignores the impact of cross-sectional dependence in test statistics. [Table 4](#) demonstrates that BHAR1 and BHAR2 results show significant levels of

¹⁴ The average cross-correlation coefficient value to be used in the cross-sectional dependence correction and the corresponding procedure are presented in [Appendix A](#).

underperformance (-54% over three years) even with adjusted t -statistics¹⁵. These results reemphasize the importance of the correct choice of benchmarks and statistical adjustments while examining the long-term performance of acquiring firms. While the value-weighted portfolio returns better capture an investor's experience, we also performed similar analysis for equal-weighted portfolios and the results are qualitatively similar (not reported here).

4.1.2 Calendar-Time Portfolio Approach: Fama-French (FF) 3-Factor methodology

Table 5 presents the results for F-F three factor regression analyses with respect to value-weight monthly portfolio return of acquiring firms (with weighted least square technique). For the “all case” scenario (Panel A), the intercept in value-weight (VW) regression is not significant: alpha or intercept = 0.4% per month, with a t -statistics of 0.776. Therefore, our results do not show any evidence of long-term underperformance for Canadian acquiring firms. This finding is consistent with BHAR results presented earlier. We also note that the coefficients of SMB and HML factors are significantly negative. A negative coefficient of SMB signifies that, as expected, the average size of acquiring firms in the portfolio is quite large¹⁶. A significant negative coefficient of HML implies that most of the firms in the portfolio are growth firms with higher price-to-book ratio. As we have reported in Table 3, approximately 81% of the acquiring firms in the sample are growth firms. Coefficients of SMB and HML reinforce the view that large and aggressive firms make more acquisitions in the Canadian market.

¹⁵ It is not unusual to see a reduction in t -statistics value in the order of 4 to 5 times after cross-dependence correction. For example, please refer to [Michell and Stafford \(2000\)](#) (Table 6, p. 307).

¹⁶ It is logical to find a negative SMB coefficient for larger firms. For example, [Barber et al. \(2001\)](#) reported negative SMB coefficient for larger size groups (group 2 and 3) while examining long-term performance of portfolios formed on the basis of analyst recommendation (Table 4, p. 546-547).

Insert Table 5 About Here

Subsequently, in order to get a better insight into the cross-sectional dependence problem that may arise due to the overlapping acquisition events by the same firm, we present the F-F three factor regression results for non-overlapping cases (Table 5 Panel B) and overlapping cases separately (Table 5 Panel C). If a firm makes acquisitions within three years of a previous acquisition, the cases were considered ‘overlapping’. Value weighted overlapping cases do not show any underperformance (alpha or intercept = 0.4% per month, with a *t*-statistics of 0.711); whereas value-weighted non-overlapping cases show positive abnormal return (alpha or intercept = 0.7% per month, with a *t*-statistics of 2.157). In the case of overlapping cases, coefficients of SMB and HML factors are similar to those of ‘all case’ scenario. This implies that firms making multiple and frequent acquisitions are larger and growth firms. For non-overlapping cases, coefficients of SMB and HML are positive and significant. This implies that firms that are not making frequent acquisitions are relatively smaller and value firms (i.e. less aggressive firms). Overall, our results do not show any strong evidence of long-term underperformance. On the contrary, firms that make infrequent acquisitions (non-overlapping cases) show improved long term performance. We also performed similar analyses for equal-weighted portfolios and different acquiring firm size groups (not reported here), but did not find any significant evidence of underperformance.

In summary, by using the event-time approach and the calendar-time approach, we do not find any strong support for long-term underperformance for acquiring firms in the post-event period. The results are similar to those previously documented by Mitchell and Stafford (2000) and are congruent with the market efficiency perspective (Fama,

1998; Kothari and Brown, 2005). In the case of BHAR methodology, we find that choice of benchmark returns plays an important role in determining the level of test statistics. We further find that test statistics could be significantly overstated if not adjusted for cross-sectional dependence. Next, we examine the impact of various deal specific and firm specific factors on acquiring firms' long-term abnormal returns.

4.2 Factor Affecting Acquiring Firm's Long-term Return Performance

In this section we report the impact of various deal specific factors and firm characteristics on long-term performance. Such factors include: (i) mode of acquisition (tender or merger), (ii) target type (public or private), (iii) related or unrelated target, (iv) payment type (stock, cash or mixed), (v) growth or value acquirer, (vi) board independence, (vii) level of managerial ownership, and (viii) relative size of the deals. Again, we use both the event-time approach (BHAR methodology) and the calendar-time approach (F-F three factor regression) in our analysis. Results are presented in [Table 6](#) and [Table 7](#) respectively.

4.2.1 Event-Time Approach: Buy and Hold Abnormal Return (BHAR)

[Table 6](#) presents the results for value-weighted BHAR analysis with respect to various factors for all acquiring firms between 1993 and 2002. As stated earlier, in our analysis and discussion we focus on the BHAR with matching firm return benchmark (BHAR3) and corresponding skewness and cross-sectional dependence adjusted t -statistics. Please note that, as expected, t -statistics are deflated once we adjust for cross-sectional dependence.

Insert Table 6 About Here

From [Table 6](#), we find that there are no significant abnormal long-term returns for tender or merger offer by looking at BHAR3 adjusted t-statistics (for matching firm BHAR). Similarly, for ‘target type’, ‘related/unrelated’ target, and ‘growth or value acquirers’ we do not find any significant results. However, we find that stock-financed deals (-10% over three years) and relatively large acquisitions (-49% over three years) under-performed in the long-run. Some of the earlier studies reported similar results for stock-financed deals. For board independence, we used the proportion of unrelated board members as a proxy. If the ratio of unrelated board members to related board members is greater than one, the board is considered independent. We find that value-weighted matching firm adjusted BHAR (BHAR3) is significantly positive (at 1% level) for dependent boards. It appears that boards with a majority of related directors tend to have a better insight about an acquisition target. We use director ownership as a proxy for ‘managerial ownership’. From [Table 6](#), we find that value-weighted long-term abnormal returns for the “directors’ ownership greater than 25%” are significantly positive. This implies that higher level of director ownership aligns directors’ interests with other shareholders’ and results in better acquisition decisions.

To augment the univariate results and to investigate the confounding impact of various independent variables, we also carried out the multivariate analysis by using OLS regression. ([results are not reported here](#)). None of the factors discussed above are significant except for relative size. This variable is positively significant only at 10% level. Next, we test the impact of same factors using the calendar-time approach to check the robustness of the results.

4.2.2 Calendar-time Approach: Fama-French (FF) 3-Factor Model

Table 7 presents abnormal returns (alphas) from F-F three factor regression models estimated over a three-year period for various factors.

Insert Table 7 About Here

In general, by using F-F three-factor regression approach, we do not find any strong evidence of underperformance for the factors tested in the analysis (Table 7). Two factors, namely ‘related acquisitions’ and ‘managerial ownership (5% to 10%)’, showed significantly strong and weak positive abnormal returns respectively.

Once we combine the findings of event-time approach and calendar-time approach, we do not find any consistent evidence for abnormal returns. For example, negative abnormal returns for ‘stock financed deals’ and ‘relative size of more than 25%’ are not observed in the calendar-time approach. Few factors show positive abnormal returns whereas few others show negative abnormal returns in different methodological approaches. Probably, these results are showing the examples of ‘chance results’ as argued by Fama (1998). He posited that “consistent with the market efficiency hypothesis that the anomalies are chance results, apparent overreaction of stock prices to information is about as common as under-reaction (p. 304)”.

4.3 Robustness checks with respect to short-term and operating performance

Earlier studies reporting long-term abnormal returns assume that the market gradually reassesses the quality of acquiring firms as the results of the acquisition become clearer (Rau and Vermaelen, 1998). According to the market efficiency

hypothesis, the market should correct any over-reaction or under-reaction within a short period of time. Long-term stock performance studies track the abnormal returns of an acquiring firm starting from the effective date of an acquisition which generally occurs a few months after the announcement date. We take the view that in an efficient market, reassessment of an acquisition event (thus the readjustment to market reactions, if any) should take place rather quickly subsequent to an announcement date. However, if an acquiring firm systematically underperforms its benchmark with respect to operating performance in the post-acquisition period (i.e. in the next three years), the market might reassess the developments over the same period. This could, in turn, lead to long-term negative abnormal returns for acquiring firms. In this section, we check for both possibilities by examining the short-term market reactions to an acquisition event around the announcement date and changes in long-term operating performance of an acquiring firm during the pre- and post-acquisition period.

4.3.1 Short-term abnormal returns around the announcement date

We follow standard-event study methodology (Lin and McConnell, 1983; Brown and Warner, 1985) to calculate the acquirer’s announcement effects – daily abnormal returns (ARs) and cumulative abnormal returns (CARs) – around initial acquisition announcements. We use the market model, which expresses daily abnormal returns as:

$$AR_{jt} = R_{jt} - (\bar{\alpha}_j + \bar{\beta}_j R_{mt}) \dots\dots\dots(6)$$

Where R_{jt} and R_{mt} are the observed returns for security “j” and the market portfolio, respectively, in time period “t” relative to the event date of interest. We compute the security-specific parameters $\bar{\alpha}_j$ and $\bar{\beta}_j$ over the estimation period t_{31} to t_{120}

trading days¹⁷. We exclude the 30-day time interval t_{-30} to t_{-1} days to avoid including information about the event that may affect security returns. We use a z-test to evaluate the significance of the ARs and CARs. Results for daily abnormal returns and cumulative abnormal returns are presented in [Table 8](#) and [Table 9](#) respectively.

Insert Table 8 About Here

Insert Table 9 About Here

[Table 8](#) reveals significantly positive ARs on t_0 and t_{+1} , respectively. These findings are consistent with earlier Canadian studies such as [Yuce and Ng \(2005\)](#) and [Ben-Amar and Andre \(2006\)](#). This positive reaction to announced acquisitions reflects the market's general confidence in the management decision. Our findings differ from U.S. results in which the ARs surrounding the announcement date are negative or insignificant. Possibly some features of the Canadian M&A market such as the larger relative size of target firms, the higher propensity of cash-financed deals, and the lack of strict anti-takeover regulations help in generating positive ARs for shareholders of acquiring firms. CAR values around the announcement date show similar results ([Table 9](#)). However, as we can see, the market subsequently corrects for its initial positive reaction to news of the acquisition. There are significant negative abnormal returns on day-6 (-0.27%) and day-10 (-0.28%) ([Table 8](#)). From [Table 9](#) we find that CAR values become insignificant in 15 days after the announcement date. Thus, our results show that initial overreactions in the Canadian market are followed by negative corrections (i.e. negative abnormal returns) in the market rather quickly and possibly much earlier than

¹⁷ Some studies use a longer estimation window (e.g., t_{-41} to t_{-240} days). As the estimation window increases, the chance of encountering other external events during this estimation period also increases. Since many acquirers make multiple acquisitions, we chose to use a shorter estimation window in our analysis.

the effective date. This result is consistent with our long-term stock performance outcomes that do not show any abnormal returns during the three years after the effective date of an acquisition.

4.3.2 Pre- and post-acquisition operating performance of acquiring firms

In this section we present the results for pre- and post-acquisition operating performance. Earlier studies have shown that results of long-run operating studies depend on methodological choices. For example, [Healy et al. \(1992\)](#) use industry mean adjusted cash flow to total assets in the pre- and post-event period to investigate the improvement on operating performance of an acquiring firm. They compare the mean and median of industry mean adjusted operating performance for the pre- and post-event period in their study. [Ghosh \(2001\)](#) argues that from an economic standpoint, the methodology employed by [Healy et al. \(1992\)](#) is flawed for at least two reasons. First, Ghosh argues that larger firms generally make acquisitions within an industry segment and they are likely to be more profitable compared to the industry average benchmark just because of the size effect ([Fama and French, 1995](#)). Second, acquiring firms generally make acquisitions following a period of above industry average performance. Consequently, [Ghosh \(2001\)](#) recommends the use of matching firm benchmarks in the spirit of Barber and Lyon's (1996) arguments. Acknowledging this debate, we used both industry-adjusted operating performance ([Healy et al., 1992](#)) and matching firm adjusted operating performance ([Ghosh, 2001](#)) approaches. In order to select a matching firm, we follow a two-stage procedure. First, we identify all the TSX firms that have not made any acquisition in the period of 1992 to 2003. Second, we perform an OLS regression

considering all acquiring firms and matching firms. We regress the firms' return on equity on firm size and market-to-book value variables (Loughran and Vijh, 1997). Subsequently, we select matching firms based on the nearest propensity score obtained by using the coefficients of firm size and price-to-book value factors.

Insert Table 10 About Here

Table 10 presents the univariate results for both (i) industry-adjusted and (ii) matching firm adjusted operating performance. We use cash flow to total assets as a proxy for operating performance (Ghosh, 2001; Healy et al., 1992). We find significant improvements in “acquiring firms” operating performance while considering industry adjusted pre- and post-acquisition operating performance (mean difference is 1.3% per year and significance level is 0.001)¹⁸. However, we do not see any significant difference in pre- and post-acquisition performance once we consider matching firm adjusted operating performance (mean difference is -0.6% per year and the significance level is 0.40). These results are similar to that of Ghosh (2001) and Healy et al. (1992). As industry-adjusted operating performance approach suffers from biases, we rely on the results obtained by matching firm approach¹⁹. We take the view that there is no significant difference between three-year post-acquisition and three-year pre-acquisition operating performance of Canadian acquiring firms. As the market takes note of the acquiring firm's operating performance, we do not expect to see any systematic long-term negative stock performance in the market. Our results on long-term stock performance that do not show any long-term abnormal returns for Canadian acquirers reinforce this view.

¹⁸ We obtain similar results with median comparison.

¹⁹ We obtain qualitatively similar results by using the ‘intercept approach’ as suggested by Healy et al. (1992).

5. Summary and Conclusions

In this study we empirically examine the long-term abnormal returns of Canadian acquiring firms by using a comprehensive sample of 1300 M&A events during the period of 1993-2002. We use both event-time and calendar-time methodologies to detect long-term abnormal returns. Consistent with the viewpoint of [Fama \(1998\)](#) and [Mitchell and Stafford \(2000\)](#) and somewhat contrary to what is typically believed, we do not find any significant long-term abnormal returns for Canadian acquirers, once we account for methodological discrepancies. Further, we investigate the robustness of the results by examining the impact of a set of deal and firm-specific factors on the long-term abnormal returns of acquiring firms. Such factors include: (i) mode of acquisition (tender or merger), (ii) target type (public or private), (iii) related or unrelated target, (iv) payment type (stock, cash or mixed), (v) growth or value acquirer, (vi) board independence, (vii) level of managerial ownership, and (viii) relative size of the deals. With respect to these factors, again, our results do not show any conclusive evidence that long-term abnormal return for Canadian acquiring firms are consistently dependent on any one of these factors. Further, we find that the Canadian market corrects for its overreaction to an acquisition announcement event within a short period of time and consistently reacts to the long-term operating performance in the post-acquisition periods. These findings provide additional support to our results of insignificant long-term abnormal returns for Canadian acquiring firms.

Our findings suggest that any results showing negative long-term abnormal performance should be viewed with caution. Though the results may vary with market

characteristics and conditions, we have to pay considerable attention to methodological choices. Results from this study also lead to conclude the following: (i) prior to making firm conclusions, investigations should be carried out using both approaches (event-time or calendar-time) and various adjustments discussed earlier should be applied to event-time and calendar-time approach (ii) univariate results of several deal specific, firm specific, and governance factors should be viewed carefully, as they ignore the confounding effects and may show abnormal returns due to ‘chance results’ (Fama, 1998). We acknowledge that there are still controversies surrounding the long-term performance methodologies that may distort empirical results. For example, it is argued that the BHAR method lacks statistical power (Kothari and Warner, 2005), and that the Fama-French three-factor approach suffers from model specification problems²⁰. Therefore, “whether the apparent abnormal returns (as reported in some studies) are due to mispricing, or simply the results of measurement problems, is a contentious and unresolved issue among financial economists” (Kothari and Warner, 2005, p. 23). We expect that the debate will continue; however, our comprehensive “out of sample” study indicates that results may vary with the capital market set-up and the choice of methodological and statistical choices used in detecting long-term abnormal returns.

²⁰ If the factors used in the model cannot explain the variation in stock returns fully, the validity of considering “alpha” or “intercept” as a measure of abnormal return is questionable. In other words, to validate the abnormal return results of the Fama-French three-factor approach (or similar Jensen alpha approach), the model should show a very high level of R-square value.

Appendix A: Cross-Correlation Calculation

We follow [Mitchell and Stafford \(2000\)](#) methodology to calculate average cross-correlation which in turn is used to calculate corrected t -statistics in buy-and-hold abnormal return (BHAR) analysis. The steps are as follows:

First, we assume a simple correlation structure to calculate the average correlation of 3-year BHARs across all of our 1300 observations. We assume that correlation is decreasing linearly as the number of overlapping months is decreasing from 36 (see [Table A1](#)). Second, we find out all acquisition events that have 36-month overlap from the effective date (i.e. complete overlap). We calculate the average correlation for such cases. The average correlation for 36-month overlapping cases is 0.130344 ([Table A1](#)). Third, we estimate correlation of other overlapping months by using 36-month average correlation. For example, with 35 month of overlap, the average correlation is $(35/36)*0.130344 = 0.126723$ ([Table A1](#)). Third, we calculate the weighted average correlation, which is 0.040405. Finally we use the following equation to calculate the ratio of standard deviation by assuming independence and standard deviation considering dependence.

$$\frac{\sigma_{BHAR}(independence)}{\sigma_{BHAR}(dependence)} \approx \frac{1}{\sqrt{1 + (N - 1)\overline{\rho_{i,j}}}}$$

Where, N = number of sample events, and $\overline{\rho_{i,j}}$ = average correlation of individual BHARs (0.040405).

Table A.1 Correlation Structure for all acquiring firms

Number of months of overlap	Number of unique correlation	Assumed Correlation Structure	Estimated Correlation
36	6121	ρ	0.130344
35	8427	35/36 . ρ	0.126723
34	8471	34/36 . ρ	0.123102
33	8467	33/36 . ρ	0.119482
32	8573	32/36 . ρ	0.115861
31	8536	31/36 . ρ	0.11224
30	8848	30/36 . ρ	0.10862
29	8348	29/36 . ρ	0.104999
28	8240	28/36 . ρ	0.101378
27	7870	27/36 . ρ	0.097758
26	7856	26/36 . ρ	0.094137
25	7553	25/36 . ρ	0.090516
24	10471	24/36 . ρ	0.086896
23	7538	23/36 . ρ	0.083275
22	7572	22/36 . ρ	0.079654
21	7561	21/36 . ρ	0.076034
20	7864	20/36 . ρ	0.072413
19	7678	19/36 . ρ	0.068792
18	7936	18/36 . ρ	0.065172
17	7720	17/36 . ρ	0.061551
16	7495	16/36 . ρ	0.057931
15	6863	15/36 . ρ	0.05431
14	6802	14/36 . ρ	0.050689
13	6719	13/36 . ρ	0.047069
12	9103	12/36 . ρ	0.043448
11	6498	11/36 . ρ	0.039827
10	6556	10/36 . ρ	0.036207
9	6706	9/36 . ρ	0.032586
8	6675	8/36 . ρ	0.028965
7	6485	7/36 . ρ	0.025345
6	6819	6/36 . ρ	0.021724
5	6552	5/36 . ρ	0.018103
4	6362	4/36 . ρ	0.014483
3	5940	3/36 . ρ	0.010862
2	5953	2/36 . ρ	0.007241
1	5836	1/36 . ρ	0.003621
0	200389	0	0
Total	469403	Average correlation	0.040405

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Tables

Table I. Key Studies in Long-Term Post Merger Performance

Study	Data	Methodology	Event Date/ Post merger period ^a	Results
Mandelker (1974)	241 NYSE mergers over 1941-1962	Fama-MacBeth (1973) two factor regression model	Completion date; 40 Months	Negative abnormal return in 40 months after event date; but statistically not significant
Langetieg (1978)	149 NYSE mergers over 1929-1969	Four models to get abnormal returns; Also used control firm approach	Completion date; 70 Months	Large negative returns using first approach; smaller and statistically insignificant negative return using control firm approach.
Asquith (1983)	196 NYSE bidders with successful mergers and 87 NYSE bidders with unsuccessful mergers (1962-1976)	Beta control portfolio to get excess return	Completion date; 240 days following outcome date	-7.2 % cumulative excess return for the successful bidders and -9.6% cumulative excess returns for the unsuccessful bidders.
Malatesta (1983)	256 U.S. acquiring firms over 1969-1974	Market Model; Separate calculation for pre- and post-event Beta	Announcement Date; +1 to +6 months +7 to +12 month	-5.4% abnormal return for +1 to +6 months and -2.2% abnormal returns for the +7 to +12 months.
Bradley and Jarrell (1988)	78 U.S. firms over 1976-1981.	Beta control portfolio to get excess return	Announcement Date; 36 months	-16% abnormal return but statistically insignificant.
Limmack (1991)	448 completed bids and 81 abandoned bids over 1977-1986 (UK market data)	Three control methods: market model, adjusted beta model and Index model	Announcement Date; 24 months	Completed bids: -14.96%, -4.67% & -7.43% Abandoned bids: -24.2%, -26.25% & -7.38%
Franks, Harris, and Titman (1991)	399 NYSE/AMEX acquisitions over 1975-1984.	Eight-portfolio model (preferred)	Announcement Date; 36 months	Insignificant abnormal return both for event time and calendar time approach.
Agrawal, Jaffe, and Mandelker (1992)	937 mergers and 227 tender offers over 1955 to 1987 (NYSE /AMEX firms)	Size and Beta adjusted portfolio formation and regression	Completion date; 60 months	-10.26% significant abnormal return for mergers in 60 months; No significant abnormal return for tender offers.
Gregory (1997)	452 U.K. firms over 1984 to 1992	Six different methods	Completion date; 24 months	-11.8% to -18% statistically significant abnormal return depending on method used.
Loughran and Vijh (1997)	947 NYSE /AMEX/ NASDAQ firms (788 merger & 135 tender offer)	Buy hold abnormal return (after size and BV/MV adjustment)	Completion date; 60 months	-15.9% significant abnormal return for mergers in 60 months; No significant abnormal return for tender offers.
Rau and Vermaelen (1998)	2823 mergers and 316 tender bids over 1980-1991	Control portfolio with size and BV/MV adjustments	Completion date; 36 months	-4% significant abnormal return for mergers in 36 months; +8.56% significant abnormal return for tender offers.
Mitchell and Stafford (2000)	2,767 acquisitions over 1961-1993	Three methods: BHAR; Calendar time portfolio with Fama-French Regression;	Completion date; 36 months	No significant abnormal return once cross-sectional dependence is taken into consideration.

Study	Data	Methodology	Event Date/ Post merger period ^a	Results
		Calendar time portfolio analysis		
Moeller, Schlingemann and Stulz (2003)	12,023 acquisitions (U.S. data) over 1980 - 2001	Two methods: BHAR; and Calendar time portfolio formation	Completion date; 36 months	BHAR: -16.02% significant abnormal return over 3-yr. Calendar time: No significant abnormal return.
Andre, Kooli, and L'Her (2004)	267 Canadian acquisitions over 1980 – 2000	Calendar time portfolio with Fama-French Regression	Completion date; 36 months	No significant abnormal return for all cases. Negative abnormal return for non-overlapping cases (143 cases).
Dube and Glascock (2006)	255 U.S. acquisitions over 1975-1996	Calendar time portfolio with Fama-French Regression (three and four factors)	Completion date; 12 months and 36 months	No risk adjusted abnormal performance in the stock returns of acquiring firms following acquisitions

Note: a – Number of months or days considered following a merger event.

Table 2. Yearly and Sectoral Distribution of Canadian Acquirers Listed on Toronto Stock Exchange

The sample size is 1300 acquisition events over 1993-2002 period by Canadian acquirers listed on the TSX. The sample includes multiple acquirers. ‘Multiple acquirers’ refers to the acquiring firms that acquire more than one target in a calendar year. ‘Single acquirers’ acquire only one target in any calendar year.

Panel A. Number of acquisitions over 1993-2002 and corresponding transaction value

	# of Transactions	# of Acquirer	# of Single Acquirer	# of Multiple Acquirer	Total Transaction Value (in \$ mil. CDN)	Avg. Transaction Value (in \$ mil. CDN)
1993	93	70	57	13	4919.0	52.9
1994	105	82	67	15	9021.2	85.9
1995	107	78	63	15	7757.6	72.5
1996	139	100	73	27	7366.3	53.0
1997	159	127	101	26	11293.7	71.0
1998	160	109	81	28	40006.9	250.0
1999	135	105	84	21	30467.8	225.7
2000	150	107	85	22	54739.8	364.9
2001	134	100	75	25	18440.2	137.6
2002	118	90	71	19	18922.5	160.4
Total	1300	968	757	211	202934.9	156.1

Panel B. Transactions by Primary SIC Code

SIC	# of Transactions	# of Acquirer	# of single Acquirer	# of Multiple Acquirer	Total Transaction Value (in \$ mil CDN)	Avg. Transaction Value (in \$ mil. CDN)
10 Minerals	394	303	242	61	31723.3	80.5
20-39 Manufacturing	325	239	184	55	89352.3	274.9
40 Communications	154	101	71	30	53195.2	345.4
50 Trade	42	35	30	5	1730.2	41.2
70-89 Services	385	290	230	60	26933.9	70.0
Total	1300	968	757	211	202934.9	156.1

Table 3. Descriptive Statistics of Deal-Specific Variables for Acquiring Firms

The sample consists of 968 annual observations for acquiring firms between 1993 and 2002 for the firm specific variables and 638 for the governance variables between 1997 and 2002; the data for previous years is not available. For acquiring firms, only one event is considered in case of multiple acquisitions by the firm in any year. “Deal size” is the total transaction value in million Canadian dollars. “Tender or merger” is a dummy variable. If the acquisition is completed through tender offer, the value is “1” and “0” otherwise. “Target type” is a categorical variable outlining the nature of target firm. Three categories are created: (i) public target (pubprv1), (ii) private target (pubprv2), and (iii) other (subsidiaries, joint ventures etc.) (pubprv3). “Related/unrelated acquisition” is a dummy variable. For related acquisition, the value is “1” and “0” otherwise. It is determined based on the SIC code of acquiring firm and target firm. Two versions of this dummy variable are created based on: (i) 4-digit SIC code, and (ii) 2-digit SIC code (not reported here). “Payment type” or “Methods of payment” is a categorical variable outlining the nature of transaction payment mode. Three categories are created: (i) cash payment (paytype1), (ii) stock payment (paytype2), and (iii) mixed or other (paytype3). “Cross border target (CrsBd2_3)” is a dummy variable. The value is “1” if the target is from outside Canada or the US and “0” otherwise. “Growth or value” is a dummy variable. The value is “1” if the acquiring firm’s price to book value ratio is greater than 1 and “0” otherwise. “Chair is related” is a dummy variable and is equal to “1” if the chair is related to management or the board, “0” otherwise. For example, if the CEO is also chair of the board, the dummy variable is equal to “1”. ‘Board independence’ is a dummy variable. The value is “1” if majority of the board members are unrelated and “0” otherwise. “Director ownership” is the percentage of outstanding shares owned by all directors (including the CEO) of the firm. Three categories are created for director ownership: for less than 5%, 5-25%, and more than 25%. “Blockholder ownership” is the percentage of outstanding shares owned by individuals or institutions other than the directors. If the blockholder ownership is less than 10%, the input value for this variable is “0”. Three categories are created for blockholder ownership: for less than 10%, 10-25%, and more than 25%. “Relative size” is the ratio of transaction value and market value of the acquiring firm’s equity. Total number of events is 1300 for each deal characteristics category.

		Number	Percentage
Deal Size (Transaction Value)	Less than 10m	535	41.2%
	10 to 100m	499	38.4%
	More than 100m	266	20.5%
Tender or Merger	Tender	142	10.9%
	Merger	1158	89.1%
Target Type	Public	400	30.8%
	Private	476	36.6%
	Other (Sub., JV)	424	32.6%
Related/ Unrelated Target (based on 4 digit SIC)	Related	527	40.5%
	Unrelated	772	59.4%
	Info. not available	1	0.1%
Methods of Payment	Cash	764	58.8%
	Stock	184	14.2%
	Other/Mixed	352	27.1%
Growth or Value Acquirers	Growth	1057	81.3%
	Value	164	12.6%
	Info. not available	79	6.1%
Chair is Related	Related	459	35.3%
	Unrelated	286	22.0%
	Info. not available	555	42.7%
Board Independence	Independent	611	47.0%
	Dependent	126	9.7%
	Info. not available	563	43.3%
Director Ownership	Less than 5%	346	26.6%
	5 to 25%	268	20.6%
	More than 25%	230	17.7%

	Info. not available	456	35.1%
Blockholder Ownership	Less than 10%	606	46.6%
	10 to 25%	102	7.8%
	More than 25%	136	10.5%
	Info. not available	456	35.1%
Cross Border Targets	Canada	755	58.1%
	USA	316	24.3%
	Other	229	17.6%
	Info. not available	456	35.1%
Relative Size	Less than 5%	496	38.2%
	5 to 25%	398	30.6%
	More than 25%	259	19.9%
	Info. not available	147	11.3%

Table 4. Buy and Hold Abnormal Return (BHAR) Considering All Acquisition Cases

“BHAR” is the buy and hold abnormal return based on the average difference in the aggregated (compounded) performance between the included stock and the benchmark over a 36-month period starting after the effective month of acquisition. We had 1018 valid cases for BHAR calculations with all cases. Value weight BHAR is calculated based on the market value weight of the acquiring firm at the effective date of acquisition. Depending on the benchmark, three different BHARs are calculated. BHAR1 uses the TSX 300 index as the benchmark. BHAR2 use equal value weight CFMRC (Canadian Financial Market Research Center) index returns as the benchmark. BHAR3 uses individual matching firm returns as the benchmark. *t*-statistics and adjusted *t*-statistics are reported. Adjusted *t*-statistics accounts for skewness and cross-sectional dependence in stock returns (see [Appendix A](#) for details). BHAR values are expressed in decimals (not in percentage).

	BHAR1 (TSX Index)	BHAR2 (CFMRC Index)	BHAR3 (Matching Firm)
BHAR	-0.54***	-0.54***	0.001
t-stat	-39.76	-39.93	0.069
Adj. t-stat	-6.07	-6.10	0.011

*Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively (based on adj. t-stat).*

Table 5. Fama-French 3-factor Regression

We used Fama French (F-F) three-factor regression to detect abnormal returns. RMRF is the difference between monthly stock return portfolio and 91-day T-bill rate. SMB is the difference between the returns of small size firm portfolios and large size firm portfolios. HML is the difference between the returns of value firm portfolios and growth firm portfolios. We use 1077 cases (with long-run return data) in the analysis to calculate value-weight returns. We used the weighted least square (WLS) technique in the case of value-weight portfolio analysis, in which the square root of the number of firms in each month is used as the weight in regression model. The “Alpha” value reported in the regression model indicates the monthly average abnormal return of the sample. Panel A presents the value weight (with WLS) analysis results for all cases (N = 1077). Panel B and Panel C presents similar results for “non-overlapping” and “overlapping” cases respectively. The number of cases (with long-run return data) used in the analysis to calculate value-weight returns are 241 and 836 for “non-overlapping cases” and “overlapping cases” respectively. If a firm makes acquisitions within three years of a previous acquisition, the cases were considered ‘overlapping’. Otherwise, events are considered “non-overlapping” cases. *t*-statistics and significance levels are reported for each factor. ‘Alpha’ values (abnormal returns) are expressed in decimals (not in percentage).

Panel A. Value Weight Calendar-Time Portfolio (All Cases) N = 1077

	<u>Factors</u>				<u>Model Characteristics</u>		
	Alpha	RMRF	SMB	HML	Adj. R Square	F-stat	Sig.
Beta	0.004	1.043***	-0.909***	-0.945***	0.672	97.796	0.000
t-stat	0.776	8.432	-4.820	-6.766			
Sig.	0.436	0.000	0.000	0.000			

Panel B. Value Weight Calendar-Time Portfolio (Non-overlapping Cases) N = 241

	<u>Factors</u>				<u>Model Characteristics</u>		
	Alpha	RMRF	SMB	HML	Adj. R Square	F-stat	Sig.
Beta	0.007**	0.850***	0.434***	0.433***	0.439	37.786	0.000
t-stat	2.157	10.516	3.576	4.789			
Sig.	0.033	0.000	0.000	0.000			

Panel C. Value Weight Calendar-Time Portfolio (Overlapping Cases) N = 836

	<u>Factors</u>				<u>Model Characteristics</u>		
	Alpha	RMRF	SMB	HML	Adj. R Square	F-stat	Sig.
Beta	0.004	1.045***	-0.955***	-0.981***	0.666	95.434	0.000
t-stat	0.711	8.203	-4.896	-6.806			
Sig.	0.479	0.000	0.000	0.000			

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively.

Table 6. Factors Affecting Long-term Performance – Event-time (BHAR) Analysis

“BHAR” is the buy and hold abnormal return based on the average difference in the aggregated (compounded) performance between the included stock and the benchmark over a 36-month period starting after the effective month of acquisition. Value weight BHAR is calculated based on the market value weight of the acquiring firm at the effective date of acquisition. In this table we focus on BHAR3 results. BHAR3 uses individual matching firm return as the benchmark. The Individual matching firm is selected based on the nearest propensity score with respect to firm size and price to book value. *t*-statistics and adjusted *t*-statistics are reported. Adjusted *t*-statistics accounts for skewness and cross-sectional dependence in stock returns (see [Appendix A](#) for details). BHAR values are expressed in decimals (not in percentage). In order to avoid the extreme value (outlier) problem, the top 1% and bottom 1% data of each variable included in the analysis are deleted. Significance of BHAR values are reported based on adjusted *t*-statistics. ‘N’ in column 2 denotes the number of cases in each sub-sample. Please refer to [Table 3](#) for a detailed description of each variable (factor) used in the analysis.

Factors		BHAR		
		(Matching Firm)	<i>t</i> -statistics	Adj. <i>t</i> -statistics
Tender or Merger	Tender (N = 112)	0.25	3.17	1.33
	Merger (N = 906)	-0.02	-1.08	-0.18
Target Type	Public (N = 322)	-0.03	-1.07	-0.29
	Private (N = 371)	-0.06	-2.67	-0.67
Related / Unrelated Target	Related (N = 383)	0.15	4.42	1.09
	Unrelated (N = 635)	-0.03	-1.75	-0.34
Payment type	Cash (N = 618)	0.12	4.69	0.92
	Stock (N = 134)	-0.10*	-4.30	-1.74
Growth or value acquirer	Growth (N = 839)	0.00	0.24	0.04
	Value (N = 124)	-0.26	-3.05	-1.25
Board Independence	Independent (N = 475)	-0.05	-2.88	-0.64
	Dependent (N = 95)	0.54***	7.35	3.11
Managerial ownership	Less than 5% (N = 268)	-0.05	-2.13	-0.62
	5 to 25% (N = 199)	-0.12	-1.52	-0.51
	More than 25% (N = 156)	0.57***	11.67	4.15
Relative Size	Less than 5% (N = 404)	0.16	4.13	0.99
	5 to 25% (N = 318)	0.18	3.65	0.98
	More than 25% (N = 192)	-0.49*	-5.70	-1.94

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively.

Table 7. Factors Affecting Long-term Performance – Calendar-time (Fama-French 3-Factor Regression) Analysis

We used Fama-French (F-F) three factor regression to detect abnormal returns and considered value-weight returns in regression models. The “alpha” value reported in the regression model indicates the monthly average abnormal return of the sample. *t*-statistics and significance levels are reported for each factor. We used all cases (both “overlapping” and “non-overlapping” cases) in the analysis. Please refer to [Table 3](#) for a detailed description of each variable (factor) used in the analysis. ‘Alpha’ values (abnormal returns) are expressed in decimals (not in percentage).

Factors		Alpha	<i>t</i> -statistics	Adj. R Sq
Tender or Merger	Tender	0.005	1.081	0.443
	Merger	0.003	0.509	0.626
Target Type	Public	0.005	1.031	0.620
	Private	0.003	0.345	0.494
Related / Unrelated Target	Related	0.008***	2.707	0.680
	Unrelated	0.004	0.643	0.597
Payment type	Cash	0.006	1.520	0.696
	Stock	-0.003	-0.269	0.348
Growth or value acquirer	Growth	0.004	0.720	0.637
	Value	-0.002	-0.423	0.375
Board Independence	Independent	0.008	0.915	0.547
	Dependent	0.006	1.124	0.326
Managerial ownership	Less than 5%	0.007	0.782	0.544
	5 to 25%	0.010*	1.901	0.538
	More than 25%	0.006	1.178	0.357
Relative Size	Less than 5%	0.007	1.457	0.572
	5 to 25%	0.003	1.058	0.531
	More than 25%	0.004	0.709	0.554

Note. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively.

Table 8. Short-run Daily Abnormal Return: Market Model²¹

The sample size was 989 for all acquiring events and 534 for all acquiring events excluding multiple acquisitions by a firm in the same calendar year. “AD” indicates the announcement date. We used the market model to determine the abnormal return and adjusted abnormal return. “AR” is the daily abnormal return based on the average difference in the return performance between the acquiring stock and the benchmark. The statistical significance of the abnormal return is examined by Z-statistics introduced by [Lin and McConnell \(1983\)](#). Standard deviation of AR used in the test accounts for the first order correlation effect. AR values are expressed in decimals (not in percentage).

Day	All Cases		Excluding Multiple Acquirers	
	<u>Avg. AR</u>	<u>Z-stat</u>	<u>Avg. AR</u>	<u>Z-stat</u>
-2	0.0023***	2.736	0.0046***	3.667
-1	0.0008	1.119	-0.0003	-0.182
AD	0.0080***	9.271	0.0100***	8.106
1	0.0043***	5.636	0.0033***	3.252
2	0.0006***	2.428	-0.0004	0.995
3	-0.0020	-1.191	-0.0027**	-2.010
4	-0.0008	-1.071	-0.0009	0.414
5	-0.0021	-0.712	-0.0026	-0.643
6	-0.0027***	-3.638	-0.0030***	-2.963
7	-0.0016*	-1.651	-0.0019	-1.347
8	0.0005	0.326	0.0012	0.702
9	-0.0012	0.609	-0.0018	0.693
10	-0.0028***	-3.089	-0.0032**	-2.506
11	-0.0015	-1.543	-0.0024	-1.459
12	0.0014	0.235	0.0026	0.767
13	-0.0006	1.041	-0.0007	0.759
14	-0.0019	-0.902	-0.0007	0.513
15	-0.0014	-1.333	0.0000	-0.176

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively.

²¹ We obtain similar results by using market-adjusted model.

Table 9. Short-run Cumulative Abnormal Return: Market Model

The sample size is 989 for all acquiring events and 534 for all acquiring events excluding multiple acquisitions by a firm in the same calendar year. We used the market model to determine the abnormal return and adjusted abnormal return. “CAR” is the average of the summation of the abnormal returns for each stock for a specific period. Four different versions of CAR were used in the analysis. The statistical significance of the abnormal return was examined by Z-statistics introduced by [Lin and McConnell \(1983\)](#). Standard deviation of AR used in the test accounts for the first order correlation effect CAR results are reported in decimals (not in percentage).

Period	All Cases		Excluding Multiple Acquirers	
	<u>Avg. CAR</u>	<u>Z-stat</u>	<u>Avg. CAR</u>	<u>Z-stat</u>
CAR (-1,+1)	0.013***	9.253	0.013***	6.453
CAR (-2,+2)	0.016***	9.476	0.017***	7.083
CAR (0,+2)	0.013***	10.008	0.013***	7.132
CAR (0,+15)	-0.004	1.104	-0.003	1.274

*Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively.*

Table 10. Operating Performance (Cash Flow to Total Assets) for Pre- and Post-Merger Period

“Industry adjusted cash flow to total asset” is the average difference in the operating performance (cash flow to total asset) between the acquiring firm and industry average for a given year relative to the acquisition year. “Industry adjusted post average cash flow to total asset” is the average of “Industry adjusted cash flow to total asset” for post acquisition period (year +1, +2 and +3). “Industry adjusted pre average cash flow to total asset” is the average of “Industry adjusted cash flow to total asset” for pre acquisition period (year -1, -2 and -3).” Industry adjusted post and pre difference” is the average of the difference between “Industry adjusted post average cash flow to total asset” and “Industry adjusted pre average cash flow to total asset”. “Matching firm adjusted cash flow to total asset” is the average difference in the operating performance (cash flow to total asset) between the acquiring firm and matching firm for a given year relative to the acquisition year. The “Individual marching firm” was selected based on the nearest propensity score with respect to firm size and price to book value. “Matching adjusted post average cash flow to total asset” is the average of “matching firm adjusted cash flow to total asset” for post acquisition period (year +1, +2 and +3). “Matching adjusted pre average cash flow to total asset” is the average of “Matching firm adjusted cash flow to total asset” for the pre-acquisition period (year -1, -2 and -3). “Matching firm adjusted post and pre difference” is the average of the difference between “Matching adjusted post average cash flow to total asset” and “Matching adjusted pre average cash flow to total asset”. *t*-statistics and significance level are reported for each mean difference. In case of multiple acquisitions by a firm in any year, only one event was considered in the analysis. All operating performance variables are expressed in decimals. Mean differences in operating performance are expressed in decimals (not in percentage).

Year Relative to M&A	Industry adjusted cash flow to total asset (Acquiring firm – Industry Avg.)			Matching firm adjusted cash flow to total asset (Acquiring firm – Matching firm)		
	Mean	t-stat	Sig,	Mean	t-stat	Sig,
3	0.046***	7.113	0.000	0.030***	3.109	0.002
2	0.046***	9.528	0.000	0.048***	5.465	0.000
1	0.047***	9.758	0.000	0.051***	5.506	0.000
-1	0.040***	8.988	0.000	0.053***	7.750	0.000
-2	0.031***	6.448	0.000	0.048***	5.863	0.000
-3	0.034***	6.673	0.000	0.057***	6.440	0.000
Post Average: mean of years 3, 2, and 1	0.047***	11.033	0.000	0.045***	5.801	0.000
Pre Average: mean of years –3, –2, and –1	0.034***	8.684	0.000	0.051***	7.911	0.000
(Post - Pre) Difference	0.013***	3.379	0.001	-0.006	-0.834	0.404

Note (1): *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively.

(2): We obtained similar results for the median values.