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The Market Impact of Mergers and Acquisitions for TSE-listed Firms

Jean-François Gratton

A Thesis in

The John Molson School of Business

Presented in Partial Fulfillment of the Requirements

For the Degree of Master of Science in Administration at Concordia University

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ABSTRACT

The Market Impact of Mergers and Acquisitions for TSE-listed Firms

Jean-Francois Gratton

This study examines the market impact of mergers and acquisitions of TSE-listed firms, and the relationship between market impact and merger partner characteristics, such as method of payment and the intensity of merger activity. The thesis also examines the impact of cross-border transactions on TSE-listed firms. The evidence suggests that cash offers generate consistently higher abnormal returns, higher trading activity, and lower bid-ask spreads around the announcement of takeovers than do stock exchange offers. The difference between cash and stock exchange offers is explained by capital gains tax liabilities and the information asymmetry associated with the method of payment. The intensity of merger activity also impacts the abnormal returns and the bid-ask spreads around the announcement dates. Finally, the evidence suggests that the announcement of cross-border transactions has a strong market impact.

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THE MARKET IMPACT OF MERGERS AND ACQUISITIONS FOR TSE-LISTED FIRMS

1. INTRODUCTION

The literature on corporate acquisitions has largely documented the behavior of bidder and target stocks around the announcement date of mergers. Two different hypotheses are offered for the larger abnormal returns associated with cash versus stock offers; namely, the information asymmetry and the tax hypotheses. The information asymmetry hypothesis suggests that the method of payment signals that managers either think their stocks are overvalued, or that they are uncertain about the future outcomes of the mergers. This suggests that investors can expect a drop in the stock price of the bidder when shares are used as the means of payment in an acquisition. In contrast, the use of cash indicates that managers believe that benefits are possible from synergies between the two merging companies. Huang and Walking (1987) argue that the larger abnormal returns for cash acquisitions are consistent with the tax hypothesis. While target shareholders are taxed for capital gains in cash mergers, taxes are deferred for investors in stock transactions. Accordingly, a cash offer has to be larger than a stock offer to offset the increased tax liability of the target shareholders. Thus, investors can expect larger abnormal returns around the announcement of a merger for both the bidders and the targets when the tender offer is in cash.

Halpern (1983) provides two reasons why a firm might consider a business combination. The first reason refers to non-value maximizing behavior by the

management of the acquiring firm. These acquisitions are attempts to maximize growth in sales or assets or to control large empires. Acquisitions of this type have no economic gains and given the negotiation and the potential problems of coordination when expanding a corporate empire, the chance of overall economic loss increases. For example, management can be interested in buying a company to provide possibilities for advancement of their star employees. Business combinations also can be driven by "Hubris", where managers wish to direct a bigger company, with more employees, more responsibilities, and finally an increase in their own remuneration. Business combinations also can be a means of managerial risk reduction at the expense of shareholders. Thus, any positive gains obtained by the target shareholders would be offset by a loss to the bidder shareholders.

The second reason to merge or to acquire a firm is to achieve the goal of value maximization of shareholder wealth by ensuring that any acquisition meets the same criteria as any other investment decision. That is, there should be economic gains from the acquisition, and the acquiring firm should at least earn a normal rate of return. Managers of the bidding firm believe that large gains from synergies are obtainable from the acquisition. Synergies may arise from economies of scale (Bradley, 1980), increased monopoly power (Eckbo, 1983; and Stillman,1983), product diversification and utilization of excess capacity (Dodd and Ruback, 1977), or replacement of inefficient management.[1]

The stock market bubble in the late 1990's generated a whole new wave of mergers and acquisitions. Compared to previous merger periods, a greater proportion of the

[1] Halpern (1983), Jensen and Ruback (1983), and Masse, Hanrahan, and Kushner (1991), amongst others.

mergers in the 1990s used stock as a medium of exchange.[2] Indeed, inflated stocks prices provided managers with the incentive to acquire firms by using their stock as a method of payment in order to gain market share and allegedly to create value for shareholders. These mergers were also driven by hubris managers, who were referred to as "CEO Stars". These managers had aspirations of becoming the leaders of the information technology generation.

Given the previous literature and recent merger activity, this thesis examines the market impact of mergers and acquisitions of TSE-listed firms, and the relationship between market impact and merger partner characteristics such as method of payment and the intensity of merger activity. The thesis also examines the impact of cross-border transactions on TSE-listed firms.

The first major finding of the thesis is that the announcement period abnormal returns for targets and bidders in mergers involving cash offers are larger than the returns for those mergers involving an exchange of stock. These results are consistent with the information asymmetry hypothesis where cash offers convey good news about synergy. The results also are consistent with the hypothesis that bidders must make a larger payment to target shareholders when they pay with cash because of the difference in tax liability between cash and stock-exchange mergers. This higher abnormal return for cash offers is associated with higher trading volume and number of trades, and smaller spreads during the announcement period.

The second major finding is that the intensity of merger activity is an important determinant of the market impact. Higher abnormal returns are found for both the bidders and the targets around the announcement of the takeovers in hot or intense merger

[2] Weston and Johnson (1999) find stock was used in 60% of the 364 largest transactions, while cash was more common for the smaller transactions.

activity periods. There also is a greater negative change in the spread at the announcement of the takeovers during hot merger activity periods.

The third major finding is a significantly higher abnormal return when either the bidders or the targets are from a foreign country. The greater risk associated with cross-border transactions may explain this result. The change in trading volume is higher for cross-border transactions compared with transactions involving two TSE-listed firms. Since there is not a significant change in the number of trades, the higher trading volume appears to be generated by larger order size.

The remainder of the thesis is organized as follows. The next section describes the previous literature on the topic and develops the hypotheses tested herein. Section three describes the data selection process and the final sample. Section four presents the methodology of the univariate tests on abnormal returns and the change in trading activity. Section five concludes the paper by presenting the major findings and their implications, and directions for future research.

2. LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

Previous studies agree that the shareholders of targets experience significant positive excess returns, and disagree on the excess returns earned by the shareholders of bidding firms. Jensen and Ruback (1983) and Kennedy and Limmack (1996) report no significant excess returns to the shareholders of biddings firms for the U.S. and U.K., respectively. In contrast, Lahey and Conn (1990), Mork, Shleifer and Vishny (1990), and Berkovitch and Narayan (1993) report a significant loss in the share prices of bidding firms.

One of the possible explanations for this behavior is the overpayment hypothesis. This hypothesis is based on the conventional wisdom that the only way to successfully

One of the possible explanations for this behavior is the overpayment hypothesis. This hypothesis is based on the conventional wisdom that the only way to successfully complete a takeover is to overpay. Roll (1986) suggests that overpayment arises because bidding firms are infected by hubris, and bidding firms simply pay too much for their targets. Mork, Shleifer, and Vishny (1990) argue that the managers of bidding firms pursue personal objectives instead of maximizing shareholder wealth.

Eckbo (1986), using monthly data, finds that shareholders of both bidding and target Canadian firms make significant gains from merger activities. Masse, Hanrahan, and Kushner (1988), using daily data, find that the gains to shareholders of target firms are concentrated in the month prior to the announcement, and that the price of shares declines following the announcement. In their sample of UK firms, Draper and Paudyal (1999) find that shareholders of the target companies benefit from the announcement of takeover bids. For their event window starting five days before the announcement and ending five days after, the cumulative abnormal returns for the target firms exceed 11%. In contrast, the shareholders of bidding firms suffer a loss of just under 1%. These differences in results may arise because prior research fails to incorporate other merger characteristics (like the intensity of takeover activity) and the impact of cross-border transactions.

Previous studies find a significant price run-up in the weeks preceding formal takeover announcements. Three possible explanations offered for the observed pre-bid price run-ups of the share prices of target firms are the market anticipation hypothesis, the insider trading-information leakage hypothesis, and stake building by a potential buyer. Jabbour, Javilvand, and Switzer (2000), and Keown and Pinkerton (1981) find that abnormal stock price performance at an early stage before the acquisition announcement is due to actual trading by corporate insiders. They report evidence that the run-up

immediately preceding the takeover announcement appears to be due to market anticipation about an impending bid for the target. Keown and Pinkerton (1981), Masse, Hanrahan, and Kushner (1991) and Arshadi and Eyssell (1993) report cumulative abnormal returns ranging from 14.04% to 32.35% over the period up to and including the announcement date. Jensen and Ruback (1983) report that more than half of this abnormal performance occurs before the actual takeover announcement. In contrast, Jennings (1994) finds that most of the abnormal returns occur on the actual announcement day (19.5%), which implies a run-up of less than 2%. Draper and Paudyal (1999) find a significant increase in the target share prices before the announcement of the bids. Finally, Jarrell and Poulsen (1989) show that the stock price of the average takeover target since 1980 moved to incorporate about one-third of the ultimate takeover premium before any formal public news of the bid.

The above reviewed literature suggests the following hypothesis:

> *Hypothesis 1*: The expectation is that positive abnormal returns will occur for both bidders and targets prior to and including the announcement of takeovers, and negative abnormal returns will occur in the period following the announcement.

Mergers and acquisitions can be settled in cash, in a stock swap agreement or in a combination of both. Previous research extensively analyzes the impact of the choice of method of payment on abnormal returns. For example, Davidson and Chen (1997), Wansley, Lane, and Yang (1983), Travlos and Papaioannou (1991), and Huang and Walking (1987) show that the abnormal returns for the announcement period for targets receiving cash are significantly larger than the abnormal returns on targets for which stock is exchanged. Travlos (1987) finds that for the period immediately preceding and following the announcement of a proposed merger or tender offer, bidding firms involved

in stock swap deals experience significant losses whereas bidding firms in cash offer mergers earn normal rates of return. He explains that bidders might use cash as a method of payment to avoid issuing undervalued stock. If bidders issue undervalued stock, then this will be detrimental to the bidder shareholders. If it is assumed that the bidders only issue correctly valued or overvalued stock, then the target shareholders may be concerned. In this case, the target shareholders may not be inclined to accept the offer in stock because of fear that the stock price will decrease in the future. Accordingly, they will prefer an offer in cash rather than in stock.

For the target, Huang and Walking (1987) find an average cumulative abnormal return of 29.3% for cash transactions, 14.4% for stock transactions, and 23.3% for a mixture of the two. They argue that the larger abnormal returns for cash transactions are consistent with the tax explanation. That is, cash offers have to be higher in value than stock offers to compensate for the immediate tax liability incurred by the target shareholders.

Eckbo, Giammarino, and Heinkel (1990) find that the average abnormal returns for the month of the announcement is larger for mixed offers than for either all-stock or all-cash bids. Calvet and Lefoll (1987), and Masse, Hanrahan, and Kushner (1991) find that both bidders and targets gains from Canadian takeover activity, and that shareholders in cash transactions fare better than shareholders in non-cash transactions. This finding is consistent with the information asymmetry hypothesis, and the tax effect resulting from the payment method. Walker (2000) investigates the strategic objective and stock price performance of acquiring firms. His results support the asymmetric information hypothesis because bidder shareholders earn higher returns following cash offers.

Seyhun (1990) examines the stock transactions of the top managers of bidder firms for their personal accounts as providing a signal about their motivations regarding corporate takeovers. His evidence does not appear to support the hypothesis that bidder managers knowingly pay too much for target firms. He also finds that bidder managers are more optimistic in cash offers than in equity offers. Laughran and Vijh (1997) find that shareholders of bidding firms suffer a loss in wealth over the long run if the method of payment is in shares, and earn a positive excess return for mergers involving cash.

Suk and Sung (1997) investigate the relationship between abnormal returns and institutional ownership for target firms. They find no difference in the abnormal returns between cash and stock-exchange offers for targets after controlling for institutional ownership and tax-related variables. Since their results are inconsistent with both the tax hypothesis and the information effect hypothesis, they offer a third hypothesis, the competition expectations hypothesis. This new hypothesis suggests that the probability of a competing bid might be lower if the current bid is a merger rather than a tender offer, because mergers are more friendly transactions than tender offers.

The above literature leads to the second hypothesis tested herein; namely:

> *Hypothesis 2*: Cash offers are likely to generate higher abnormal returns than stock exchange offers, and the abnormal returns associated with mixed offers are expected to lie somewhere between these two extremes.

Another interesting issue is the behavior of trading activity over the period preceding and following the announcement of a merger. Kyle (1985), Easley and O'Hara (1987) and Admati and Pfleiderer (1988) find that mergers might be expected to generate significant surges in trading activity for both the bidders and targets. Pound and Zeckhauser (1990), Arshadi and Eyssell (1993), Schwert (1996), Arshadi (1998), Jarrell

and Poulson (1989), Ascioglu, McInish, and Wood (2002), and Keown, Pinkerton and Bolster (1992) report a significant increase in the trading volume of target shares prior to the announcement of takeover bids. Conrad and Niden (1992) find that trading volume increases dramatically beginning only three days prior to the announcement.

In contrast, Sanders and Zdanowicz (1992) find no evidence of additional trading volume prior to the event day. Draper and Paudyal (1999) argue that the observed run-up in pre-announcement price, possibly due to information leakage or stake building by the potential bidder, suggests that there may be an increase in the number of transactions. Draper and Paudyal report a significant increase in the share trading activity of targets and bidding companies, especially on the day prior and on the actual announcement date. Pound and Zeckhauser (1990) analyze the special case of the effect of takeover rumors on stock prices. They find that most takeover rumors are preceded by unusual price and volume activity in the stock of the rumored target, which may foster speculation that a large block position is being accumulated.

Trading activity also can be tested using the number of trades during each specific day. Draper and Paudyal (1999) find a significant increase in the number of trades surrounding the announcement of takeover bids. Conrad and Niden (1992) also find a significant increase in the number of trades starting three days prior and including the announcement date of the takeover. They report an abnormal change in the number of trades that is significantly negative beginning on day +1 and continuing through day +4.

This literature leads to the third hypothesis tested herein; namely:

> *Hypothesis 3*: Trading volume and number of trades are expected to be significantly higher for the period prior and including the announcement of takeovers.

Previous studies also analyze the behavior of the bid-ask spread around the announcement of takeovers. Ascioglu, Mclnish, and Wood (2002) present evidence of a significantly narrowing spread and a significant lower adverse-selection component of the bid-ask spread, which persists after the announcement. They show that the decrease in the adverse-selection component of the bid-ask spread is significant for every trade-size category. Ascioglu et al. conclude that trading after the merger announcement is liquidity motivated. Draper and Paudyal (1999) provide evidence of a significant decline in the bid-ask spreads of target firms following the announcement of the takeover bids. They explain this phenomenon by the increased liquidity of the shares that cause a decline in the inventory holding costs and adverse information cost components of the spread. Moreover, the increases in order size can cause a decline in per share order processing costs. In contrast, if the reasons for the increased trades are not apparent due to information asymmetry, market makers may increase the adverse-selection cost component of the bid-ask spread. Conrad and Niden (1992) find evidence of a significant negative abnormal change in spread on the day prior and on the announcement date, and that the spread declines and persists at its lower level thereafter. They explain this decline by the reduced information asymmetry between specialists and traders after public announcements of the acquisitions.

Conrad, Mandelker, Niden, Rosenfeld, and Shastri (1992) examine a sample of Nasdaq targets around merger announcements, and find a significant spread increase on the event date. Using intraday data, Jennings (1994) also finds a significant increase in the spread prior to important disclosures. Conrad and Niden (1992) and Ascioglu, Mclnish, and Wood (2002) do not find any widening of the spread before the announcement of mergers and acquisitions.

Menyah and Paudyal (1996) report that the bid-ask spreads on the London Stock Exchange are a function of share price, variability of share price changes, volume of transactions and the level of competition among market makers. Their evidence suggests that any event that triggers the possibility of more trades may affect the size of the spread, given the assumption that the information is the same for all parties involved in the transaction.

Conrad and Niden (1992) report evidence of a substantial change in the bid-ask spread, trading volume and number of trades for their sample of NYSE takeovers but find little evidence of adverse selection. Menyah and Paudyal (1996) suggest that trading activity variables play a significant role in explaining the size of the quoted spread. Studies on inventory carrying cost by Demsetz (1968), Tinic and West (1972), and Benston and Hagerman (1974) find that the spread is positively related to share price. Accordingly, in the analysis of the determinants of the change in spread conducted herein, a variable is added to control for the relationship of spread with the price level.

This literature leads to the formulation of the fourth hypothesis tested herein; namely:

> *Hypothesis 4:* The change in the bid-ask spread for both bidders and targets is expected to be negative at the merger announcement, and this lower spread is expected to persist after the announcement.

Three specific characteristics of takeovers are included in the analysis of the market impact conducted herein. They are intensity of merger activity, whether or not the transactions are cross-border, and whether or not the transactions are concluded successfully. Brailsford, Heaney, Powell, and Shi (2000) examine the return differences in hot and cold periods of IPO activities. They find that the market for unseasoned equity has the unusual and distinguishing feature of periods of concentrated activity in terms of

both volume and under-pricing. For the takeovers of technology firms, Kohers and Kohers (2001) examine whether the high expectations regarding the future merits of investments in the 1990's were actually justified. Kohers and Kohers find that, although the shareholders of acquiring firms respond favorably to high-tech takeover announcements, these firms generally under-perform industry-matched benchmarks and size- and book-to-market matched control portfolios over the long run. This indicates that the market tends to exhibit excess enthusiasm about the expected benefits of certain high-tech acquisitions. One of their concerns is whether or not this excess enthusiasm was contagious to other sectors.

The number of cross-border transactions also increased in the 1990's. This involved Canadian firms with the desire to gain access or to increase their market share abroad, or non-Canadian companies interested in the Canadian market.

About 21% of the sample studied herein consists of unsuccessful attempts at merger or acquisitions. At the announcement of a takeover, investors cannot be certain of the future outcome of the transaction since there may be competing bids, the first bid may have to be increased, or shareholders may reject the bid. Brown and Raymond (1986), and Samuelson and Rosenthal (1986) examine the period during which the target firm is in play. They find that the average stock price of successfully targeted firms tends to rise during the bid period so that it converges with the offer price at the bid's conclusion. The average stock price of unsuccessfully targeted firms tends to remain below the offer price. This implies that the market efficiently estimates the likelihood of success of takeover bids. In contrast, Bradley, Desai, and Kim (1983) find that the excess returns for targets are not reversed when it becomes apparent that the bid has failed. Hutson (2000)

finds evidence that the market at an early stage cannot distinguish between takeovers that are likely to be successful and those that are not.

This reviewed literature leads to the formulation of the fifth hypothesis tested herein; namely:

> *Hypothesis 5:* The intensity of merger activity, cross-border transactions, and the success of a bid are significant determinants of the market impact of mergers and acquisitions.

3. DATA SELECTION

The sample consists of all of the mergers and acquisitions announced between January 1, 1991 and December 31, 2001, inclusive. To be included in the initial sample, either the target or the bidder firm has to be listed on the Toronto Stock Exchange (9175 transactions) and have a minimum transaction value of US$25M (1680 transactions). This minimum transaction size screen excludes smaller mergers and acquisitions, which are likely to exhibit thin trading problems.

The announcement and completion dates, the method of payment, the stock exchange listing of the merger partners, and the value of the transactions are drawn from the Securities Data Corporation (SDC) database. A check of the SDC database and Lexis Nexis is made for confounding events over the period from a year prior to the announcement date to three months after this date. Confounding events over this window include other mergers or acquisitions or issues of shares, convertible bonds, debentures, or notes by either merger party. After eliminating all transactions with such confounding events, the sample is reduced to 641 transactions consisting of 738 firms that are either bidders or targets. The resulting sample should be representative of the Canadian mergers

and acquisitions that occurred during the last decade (see table 1 for further details on the sample selection process).

Market data for both the acquirer and target firms are drawn from the CFMRC database. This includes the daily share prices, transaction volumes, number of trades, daily closing bid-ask quotes, dividend announcements and price adjustments (like stock splits). Since data are not available on the CFMRC for some of the 738 firms for the period from one year prior to three months after the merger, these firms also are deleted from the sample. After further eliminating 18 firms with more than 20% of their daily data missing, the final sample consists of 497 firms. Further details on the number of bidders and targets are reported in table 2.

4. UNIVARIATE TESTS, METHODOLOGY, AND RESULTS

4.1 Abnormal Returns

An event-study type of methodology using dummy variables is used to calculate the abnormal returns associated with the merger announcements. The specific regression model that is estimated is as follows:

$$R_{jt} = \alpha_0 + \beta_1 \, MARKET_{jt} + \beta_2 \, SHIFT_{jt} + \beta_2 \, ANNOUN_{jt} + \beta_3 \, RUNNUP_{jt} + \beta_4 \, MARKUP_{jt} + \varepsilon_j \qquad (1)$$

In equation (1), R_{jt} is the return on firm j during period t, where t runs from day 250 prior to announcement date 0 until 60 days after the announcement date. The variable $MARKET_{jt}$ is the return on the TSE-300 Total for day t over the same period of time relative to the announcement date. The variable SHIFT is a dummy variable that is designed to capture the change in the stock beta after the announcement of a merger. This dummy variable is set to the market return for days zero to day 60 after the

announcement date and is zero otherwise. The dummy variable ANNOUN is designed so that its coefficient estimate captures the abnormal return on the announcement date, and this dummy variable is equal to one for each day in the event window [-1, +1] centered on the announcement date, and is zero otherwise. The coefficient of ANNOUN gives the three-day mean abnormal return for the announcement date. The dummy variable RUNNUP takes the value of one in the event window [-20, -2] and is zero otherwise. The estimated coefficient of this dummy variable is used to capture the effect of the pre-bid price run-up. Finally, the dummy variable MARKUP takes the value of one in the event window [+2, +20], and is zero otherwise. The estimated coefficients of the RUNNUP and MARKUP variables provide the mean daily abnormal returns over the 19-day periods just proceeding and just following the announcement date. Multiplying each of these coefficient estimates by 19 generates the cumulative abnormal returns for each of these 19-day periods. A similar regression with only the event window [-5, +5] dummy is estimated to obtain another measure of the announcement effect.

The various estimates of the abnormal returns for the bidders and targets are presented in table 3. Consistent with the results previously reported in the literature, shareholders of target firms benefit from mergers. Stock prices increase, on average, by more than 16% for the period under study herein. This result is consistent with the findings by Keown and Pinkerton (1981), Masse, Hanrahan, and Kusher (1991) and Arshadi and Eyssell (1993). The average abnormal return associated with the run-up for the targets is a significant 4.22%. The run-up can be explained by the anticipation, the insider trading, or the stake building by potential buyers hypotheses (Draper and Paudyal, 1999). This run-up represents slightly over one-fifth of the overall abnormal return. It is lower in value than that found by Jarrell and Poulsen (1989) who find that the stock price

of the average takeover target moved to incorporate about one-third of the ultimate abnormal returns before any formal public news of the bid is provided to the market. The size of run-up abnormal return is consistent with Jennings (1994) who finds that most of the abnormal returns occur on the actual announcement date. The mark-up for the sample examined herein is a significant –1.45%. For the event window [-5, +5], the cumulative mean abnormal return is 17.29%, which is higher than that reported by Draper and Paudyal (1999). This higher amount might be explained by the existence of a "hot merger" period in the sample studied herein. This issue is addressed further below.

The announcement mean abnormal return for bidders is a strongly significant 1.44%. Although the abnormal returns for the bidding firms are positive, they are unlikely to lead to the development of a profitable trading strategy net of transactions costs unless one can successfully identify potential targets of mergers or tender offers a priori. This is consistent with the findings of Eckbo (1986) and Masse, Hanrahan, and Kusher (1991) that shareholders of both the bidding and target firms make significant gains from merger activities in Canada. The results are inconsistent with the findings of Jensen and Ruback (1983) and Kennedy and Limmack (1986) who report no significant excess returns for the shareholders of the bidding firms in the U.S., and with Lahey and Conn (1990) and Berkovich and Narayan (1993) who report significant losses for the shareholders of bidding firms in the U.S. The average abnormal return associated with the run-up for the bidder is a strongly significant 4.22%. The mark-up for the sample examined herein is a significant –1.71%. The abnormal returns for the run-up and mark-up periods are of the same magnitude for the bidding and target firms. Thus, the findings reported herein support the first hypothesis of positive mean abnormal returns for both bidders and

targets prior to and including the announcements of takeovers, and negative abnormal returns in the period following the announcements.

While the literature generally agrees that shareholders of targets and bidder earn positive and near zero excess returns, respectively, some issues essentially remain unresolved. These issues include whether or not the market response to a bid announcement is constant through time, especially over "hot" and "cold" periods of merger activity. Figure 1 presents the abnormal returns for bidders and targets for each year in the sample studied herein.

Although it is not possible to distinguish a clear pattern in the abnormal returns for bidders and targets through time based on an examination of figure 1, some observations are possible. The three smallest average abnormal returns for the targets are concentrated in the first half of the 1990's, which corresponds to a period of cold merger activity. As expected, the peak in the abnormal returns corresponds with the culmination of the stock market bubble in 2000.

4.1.1 Abnormal returns and method of payment

Travlos (1987) suggests that failing to observe large abnormal returns might be caused by ignoring the method of payment. The abnormal return results for three categories of method of payment are presented in table 4. As expected, the 98 cash offers generate significant and higher average abnormal returns of almost 6% for the shareholders of the targets than do the 67 stock offers.[3] The same difference of 6% is observed for the enlarged event window [-5, +5]. These findings are consistent with those of Masse, Hanrahan, and Kushner (1991), among others, who demonstrate that cash proposals result in higher returns than share exchange proposals. Many explanations are

[3] 50 transactions involve a mix of stock and cash.

proposed for the higher abnormal returns associated with cash transactions. First, since the bidders want to acquire the firms, they are willing to pay a higher premium to successfully effect the transaction. It is also possible that managers are more confident that the fusions will create synergies so they decide to offer cash. Finally, possible tax advantages to the shareholders of the targets might create these higher excess returns. Since the differences in abnormal returns between cash and stock offers for the targets are concentrated at the announcement of the bid, no significant differences are found in the run-up and mark-up periods.

Consistent with the results previously reported in the literature, excess returns are higher for the shareholders of the bidders when offers involve cash. The mean cumulative abnormal returns are a strongly significant 2.27% for the 154 cash offers, and a not significant -0.78% for the 58 stock exchange offers.[4] According to Myers and Majluf (1984) and DeAngelo, DeAngelo, and Rice (1984), the method of payment may signal what management thinks about the value of the company to shareholders. If the management of bidders perceive their shares as being undervalued, they will propose a cash offer. Accordingly, investors react to the announcement positively by bidding up the stock price. In contrast, if managers perceive their shares as being overvalued, they will offer a stock exchange, and the market will react negatively to the announcement by bidding the price downwards. This phenomenon is referred to in the literature as the information asymmetry hypothesis or the signaling effect.

The findings reported herein are similar to those reported by Travlos (1987) that bidders in pure share exchange and cash offers incur significant losses and normal rates of return, respectively. This differs from the results of Masse, Hanrahan, and Kushner

[4] 70 offers consist of a mix of stock and cash.

(1991), and Calvet and Lefoll (1987) that find that bidders making share exchange offers also gain. The average mark-up or mean abnormal return for the day following the announcement is a significant –5.26% for cash offers and near zero for stock offers. This finding is consistent with the signaling hypothesis where bidder shareholders perceive a stock offer as bad news. Thus, support is reported herein for hypothesis 2 that cash offers generate higher abnormal returns than stock exchange offers, and that the abnormal returns associated with mixed offers lie between these two extremes.

4.1.2 Abnormal returns and home and listing domicile of merger partners

The dependence of market impact of mergers on the geographic location or domicile of the bidders and targets is examined now. The number of cross-border mergers and acquisitions increased significantly over the last two decades. The sample studied herein consists of 174 transactions where either the bidder or the target is foreign, 167 transactions where both merger partners are listed on the TSE, and 156 transactions where only one of the two Canadians firms is listed on the TSE.[5] The abnormal returns for these three sub-samples are examined to assess whether a premium is associated with cross-border transactions. The abnormal returns for these three sub-samples (deemed Toronto-Toronto, Toronto-Canada, and Toronto-Cross-border) are reported in table 5.

Based on table 5, the mean cumulative abnormal returns is a strongly significant 18.61% for cross-border transactions compared with a strongly significant 14.94% when both firms are listed on the TSE. The difference between cross-border transactions and when both firms are listed on the TSE is (weakly) significant. The abnormal returns, which are 5.08% for the run-up period for the cross-border transactions, are offset by a change of -2.47% in the mark-up period. When TSE-listed targets receive a bid from a

5 The merger partner is either a private company or listed on the Vancouver Stock Exchange.

Canadian company not listed on the TSE, the abnormal returns are similar to those for transactions where both firms are listed on the TSE.

Shareholders of the bidding firms react, on average, positively to the announcement of a cross-border transaction. The excess of cross-border over within-border transactions is nearly 4% and is strongly significant. Also, a greater anticipation effect as embodied in a run-up of 5.19% occurs for cross-border transactions. For the mark-up period, the mean abnormal return is a significant –3.33% for bidders involved in cross-border transactions.

Overall, the findings reported herein support the theory of information asymmetry for targets. This means that the average foreign acquirer pays a greater premium to buy a TSE-listed firm than when the bid is made by another TSE-listed firm. Also, when TSE-listed firms make an offer to a foreign firm, the shareholders of the bidder react positively.

4.2 Trading Activity

The entrance of new information into the market is likely to generate an increase in trading activity. As noted already in the literature, trading activity appears to change in the run-up and mark-up period around takeover announcements. The two measures of trading activity examined herein are the daily change in trading volumes and the number of trades.

To examine if abnormal trading activities occur around the announcements of takeovers, a methodology similar to that used by Ajinkya and Jain (1989) and Sanders and Zdanowicz (1992) is used. This involves an examination of the daily change in V_{it}, which is given by ln (1+ firm i's trading volume on day t). According to Conrad and Niden (1992), the transformation of the volume by taking the natural log enhances the

normality of the distribution of volume changes. The excess change in volume or number of trades is given by:

$$EV_{jt} = (CV_{jt} - MCV_{jt}) \quad (2)$$

In equation (2), the variable EV_{jt} is the excess change in volume or number of trades for firm j over day t. The variable CV_{jt} is the mean change in volume or number of trades over the event window [-1,+1], the run-up window [-20, -2], and the mark-up window [+2, +20]. The variable MCV_{jt} is the mean of the change in volume or number of trades during the estimation period, which herein goes from 140 through 40 days prior to the announcement.

The empirical results for the excess change in trading volume and number of trades are reported in Table 6. The excess change in trading volume at takeover announcements is a significant 7.38% and 1.9% for the targets and bidders, respectively. No significant change is found in the run-up period for trading volume for both bidders and targets. These run-up results are consistent with those reported by Conrad and Niden (1992), Draper and Paudyal (1999) and Sanders and Zdanowicz (1992) who do not find a significant excess volume in the run-up period. The change in trading volume of –2.31% for the targets and –0.52% for the bidders in the mark-up period are strongly significant. Overall, the results reported herein support the conjecture that information such as the announcement of a takeover generates higher trading volumes.

Similar results are found for the change in the number of trades at the announcement date. The excess change in the number of trades of 20.12% for the targets and 4.13% for the bidders are strongly significant. The run-up changes in number of trades are not significant for the targets and bidders. The mark-up is a strongly significant –3.01% for

the targets and a weakly significant –0.87% for the bidders. These results are consistent with those previously reported in the literature.

4.2.1 Trading activity and method of payment

Whether trading activity is related to the method of payment used in the business combination is examined now. Because the results are similar for both trade metrics, only those for the change in trading volume are presented in table 7, and discussed herein.

As expected, the highest change in excess trading volume for the targets occurs at the announcement of a cash offer (9.26% versus 6.13% for a stock offer) and the difference is significant at the 5% level. The increase in trading activity for cash offers is temporary because it decreases on average during the mark-up period.

The change in excess volume for bidders at the announcement of takeovers is a weakly significant 0.07% for cash offers, a weakly significant 0.45% for stock offers, and a strongly significant 0.57% for mixed offers. Given the negative mean abnormal returns when bidders offer stock as a method of payment, the significant increase in the trading volume for either mixed or stock offers is probably generated by selling shareholders. Hypothesis 3, which specifies a significant increase in trading activity around the announcement of takeovers, is supported by the empirical findings. However, this effect is temporary since the post-announcement change in excess volume is negative. Unlike prior research, no significant change in excess trading volume prior to the announcement is identified herein.

4.3 Bid-Ask Spreads

Although many trades take place inside the spread, most small investors trade either at the bid or the ask. Thus, a lower quoted spread decreases the trade cost for individual investors. The expectation is that the daily quoted spread decreases as the time to

announcement approaches, and that the announcement itself leads to lower trade costs due to its upward impact on trading activity. The increase in liquidity of the shares leads to a decline in the inventory holding cost of the spread and ultimately a decrease in the overall spreads.

Stoll (2000) defines the quoted spread as a static measure observable at a specified moment in time. The bid-ask spread is given by:

$$S_{jt} = (A_{jt} - B_{jt}) \quad (3)$$

In equation (3), S_{jt} is the bid-ask spread for firm j at time t, where t runs from day 140 prior to the announcement date 0 until 40 days after the announcement date. The variables A_{jt} and B_{jt} are the closing ask and bid prices, respectively. Similar to that done in Draper and Paudyal (1999), the spread is divided by closing price (mid-spread) herein.

The change in the excess spread is computed as:

$$ES_{jt} = (SP_{jt} - MSP_{jt}) \quad (4)$$

In equation (4), the variable ES_{jt} is the change in the excess bid-ask spread of firm j during period t. The variable SP_{jt} is the mean of the change in the spread over the specified event window. The variable MSP_{jt} is the mean of the change in the spread during the estimation period, which goes from 140 through 40 trading days prior to the announcement. The event window includes the event [-1,+1], the run-up [-20, -2], and the mark-up [+2, +20] periods. When the spread measures are adjusted (i.e., divided) by the share price, they are referred to as being "adjusted".

The results for the change in excess unadjusted and adjusted spreads are presented in table 8. The column "Adjusted" refers to the change in the spread as a percentage of its corresponding share price.

As expected, the change in the unadjusted spread around the announcement of targets is a significant –17.36%. This finding is consistent with that reported previously by, for example, Conrad and Niden (1992). This finding also is consistent with the results on trading volume reported earlier because the increase in trading activity usually leads to a decrease in the spread. The spread stays at the lower level following the announcement of the takeovers. This may be attributed to a decrease in the information asymmetry between the market makers and the investing public in the post-announcement period.

The mean change in the unadjusted spread for bidders at the announcement of takeovers is a strongly significant –6.67%. The change is not significant for the larger event window [-5, +5]. The decrease in the average spread for the announcement is preceded by a significant increase of 3.36% and followed by an insignificant 2.41%.

The mean change in the adjusted spread at announcement of takeovers for the targets also is a strongly significant –4.31%. This is followed by a further significant change of –1.77% in the mark-up period. The mean change in the adjusted spreads for the bidders in the run-up period is also negative but not significant. The adjusted changes in spread for bidders are not significant for all the studied windows.

Overall, the closing bid-ask quotes get smaller at the time of the announcement of takeovers for both the bidders and the targets. While the evidence for the bidders is weak, the average change is still significant for the non-adjusted spread. Thus, support is provided for hypothesis 4; that is, the spread becomes smaller on and after the merger announcement.

4.3.1 Bid-ask spread and method of payment

The change in the non-adjusted and adjusted spreads for the various groups of transactions classified by method of payment are now examined. Because a cash offer

generates a greater positive change in trading activity, it is expected to result in a greater decrease in the spread.

The empirical results for the average change in the unadjusted and adjusted spreads grouped by the method of payment are reported in table 9. As expected, the mean change in the spread for cash offers for targets is a significant -4.96% at the announcement of a merger, and a significant –2.7% in the mark-up period. For stock transactions, only the mean change in the spread at the announcement of –3.98% is significant (weakly). For mixed transactions, only the mean change in the spread of –2.82% is significant (weakly) over the event window [-5, +5] for targets. The results are similar to those reported by Draper and Paudyal (1999) for their sample of UK mergers and acquisitions. Draper and Paudyal also fail to observe a change in the spread for targets for the period prior to the announcement of the bid.

No significant changes in the unadjusted and adjusted spreads are identified for any of the studied windows for the three sub-samples based on method of payment. This also is consistent with previously reported results in the literature. The overall results support hypothesis 4; that is, there is a negative change in the spread at the merger announcement and a lower spread thereafter for the targets only.

5. THE DETERMINANTS OF THE ABNORMAL RETURNS, TRADING ACTIVITY AND TRADE COSTS ON THE ANNOUNCEMENT DATE

5.1 Abnormal Return Determinants

In this section, the determinants of the abnormal returns, trading activity and relative quoted spreads on the announcement date are determined. The specific cross-sectional regression model that is estimated to identify the determinants of the abnormal returns on the announcement date is as follows:

$$AR_{jt} = \beta_1 TORONTO_{jt} + \beta_2 CROSS\text{-}BORDER_{jt} + \beta_3 CASH_{jt} + \beta_4 STOCK_{jt} + \beta_5 SUCCESSFUL_{jt} + \beta_5 HOT_{jt} + \beta_7 VALUE_{jt} + \varepsilon_{jt} \quad (5)$$

In equation (5), AR_{jt} is the abnormal return for firm j during period t where t is either the announcement [-1, +1], the run-up [-20, -2], or the mark-up [+2, +20] period. The dummy variable TORONTO takes the value of one if both firms are listed on the TSE, and is zero otherwise. The dummy variable CROSS-BORDER takes the value of one for a cross-border transaction, and is zero otherwise. The dummy variable CASH takes the value of one if the offer is in cash, and is zero otherwise. The dummy variable STOCK takes the value of one if the offer is an exchange of stock, and is zero otherwise. The dummy variable SUCCESSFUL takes the value of one if the takeover is successful, and is zero otherwise. The dummy variable HOT takes the value of one if the transaction occurred from 1997 onwards, and is zero otherwise. Finally, the variable VALUE is the log of the deal value.

The various cross-sectional regression results for the bidders and targets for the announcement, run-up and mark-up periods are presented in table 10. The estimated coefficient of the CROSS-BORDER dummy is a significant 0.0661. This suggests that the abnormal returns at the announcement of a merger are positively related to whether

the bidder is from a foreign country. This result is consistent with the univariate analysis results when one of the two firms involved in the merger transaction is foreign. As expected, the estimated coefficient of the CASH dummy is a significant 0.0652. This is consistent with the information asymmetry and tax hypotheses discussed earlier. The estimated coefficient of the STOCK variable is not significant which supports the argument presented above that stock and mixed offers are similar. The estimated coefficient of the variable HOT of 0.0409 is weakly significant, which suggests a possible change in the dynamics of abnormal returns depending upon the intensity of current merger activity. The estimated coefficient of the VALUE variable of 0.0105 is weakly significant. This implies that the size of the transaction is related to the abnormal returns. The estimated coefficient for the dummy variable SUCCESSFUL is surprisingly not significant. The expectation was a positive relationship because the market should react more vigorously if it believes that the bid has a good chance to be accepted.

None of the estimated coefficients are significant for the run-up abnormal returns. It is not surprising that the run-up abnormal returns are not related with any specific characteristic of the bid since such information is private prior to its release. The abnormal returns during the run-up period are probably better explained by possible rumors, stake building from the potential bidding firm, or by the market anticipation hypothesis. Similarly, no significant relationships are found between the abnormal returns in the mark-up period and the independent variables under study. Again, this is not surprising in an efficient market since the information on the characteristics of the bid should be incorporated fully into prices at the announcement.

The relationships between the abnormal returns at announcement for the bidders and most of the independent variables used herein are not significant. While the estimated

coefficients for STOCK and CASH have the postulated negative and positive signs, they are not significant. Their estimated coefficients are only significant when they are the only two variables included in the cross-sectional regression. The only estimated coefficient that is significant is the one (0.0270) for the variable HOT. This suggests that the shareholders of the bidding firm earn a positive and significant abnormal return from business combinations during hot merger activity periods.

Based on table 10, most of the estimated coefficients for the independent variables included in the cross-sectional regressions for the abnormal returns for the run-up period for both targets and bidders are not significant. An exception is the CROSS-BORDER variable for the bidders whose estimated coefficient of 0.0348 is marginally significant in the run-up. A possible explanation for this result is that investors can more easily anticipate the announcement of cross-border transactions since TSE-listed firms commonly announce their long-term plans to purchase potential targets in the USA or in Europe. However, the anticipation effect of these cross-border transactions is largely offset post-announcement given the significant estimated coefficient of –0.0372 for this variable for bidders in the mark-up period.

Other significant coefficients in the mark-up window occur only for bidders. These include the estimated coefficient of –0.0571 for stock offers, -0.0384 for periods with hot merger activity, and 0.0391 if the offer is eventually successful. The stock offer finding is consistent with the previous literature, and is supportive of the information asymmetry hypothesis. From an ex post perspective, we know that the stock market was in a bubble at the end of the 1990's and that managers used their overvalued shares as a powerful medium of exchange. However, investors of bidding firms who reflected such overvaluation in the prices of the bidding firms anticipated this overvaluation.

Overall, the results for the bidders and the targets reported in table 10 support the analysis of the abnormal returns reported and discussed in the univariate test section of this thesis. Specifically, the method of payment and the geographic location of bidders and targets are important determinants of the abnormal returns associated with mergers.

A further series of cross-sectional regressions are now run to analyze if the independent variables of the abnormal returns are significantly different between periods of hot and cold merger activity for both targets and bidders. The coefficient estimates and tests of their significance for the determinants of the abnormal returns for the event window [-1, +1] for bidders and targets are presented in table 11.

Based on table 11, only the estimated coefficient for the CROSS-BORDER variable is significant (weakly) for the hot merger activity period for both targets and bidders. However, the differences in the estimated coefficient of 0.0757 and 0.0603 between the hot and cold merger-activity periods are not significant. The only significant coefficient estimates for the cold merger activity periods are for the CASH variable (0.1077) and the deal VALUE variable (0.0157), which are both only weakly significant and positive. Thus, cash offers and the value of the transactions are of significant importance in determining abnormal returns on merger announcements during cold merger activity periods.

5.2 Trading Activity Determinants

In this section, the impact of the announcement of a takeover on two trading activity variables is assessed. To this end, the following regression model is estimated:

$$EV_{jt} = \alpha_0 + \beta_1 \text{TORONTO}_{jt} + \beta_2 \text{CROSS-BORDER}_{jt} + \beta_3 \text{CASH}_{jt} + \beta_4 \text{STOCK}_{jt}$$
$$+ \beta_5 \text{HOT}_{jt} + \beta_6 \text{VOLUME}_{jt} + \beta_7 \text{NTRANS}_{jt} + \beta_9 \text{VALUE}_{jt} + \varepsilon_{jt} \qquad (6)$$

In equation (6), EV_{jt} is the change in excess volume for firm j during period t, where t is either the announcement [-1, +1], or the mark-up [+2, +20] period. The variable TORONTO, CROSS-BORDER, CASH, STOCK, HOT, and VALUE are as defined earlier in the thesis. The variable VOLUME is the log (1+ daily trading volume), and is included only in the regression for the number of trades. The variable NTRANS is equal to log (1+ Number of trades), and is only included in the trading volume regression.

The analysis is restricted only to the event and the mark-up period given the results reported earlier. The results are presented in panels A and B of table 12 for the targets and bidders, respectively.

The estimated coefficients for the change in the excess trading volume regression are examined first for the target firms for the event window. The estimated coefficients of the dummy variables, CROSS-BORDER and CASH, and the number of trades are 0.0309, 0.0368 and –0.0140, respectively, and are significant for the announcement window for the targets. These findings suggest that excess trading volume increases for companies that either receive an offer in cash and/or an offer that is cross-border, and decreases with a higher number of trades. The estimated coefficient of 0.0103 for the number of trades is the only significant coefficient for the change in excess trading volume relationship for the mark-up window for the targets.

The estimated coefficients for the change in the excess number of trades regression are examined next for the target firms for the event window. The estimated coefficients of 0.1679, 0.1360 and 0.1351 for the dummy variables TORONTO, CROSS-BORDER and CASH are all significant.[6] The estimated coefficient of –0.0613 for trading volume is

[6] The estimated coefficient for CROSS-BORDER is only weakly significant.

also significant, which suggests that changes in the excess number of trades are inversely related with changes in trading volume during the event window.

The estimated coefficients for the change in the excess number of trades regression are examined next for the target firms for the mark-up window. Only the estimated coefficient for the trading volume variable is (weakly) significant. Its value of –0.0096 suggests that changes in the excess number of trades over the mark-up window are inversely related with changes in trading volumes.

The estimated coefficients for the change in the excess trading volume regression are examined next for the bidder firms for the event window. The estimated coefficient of the TORONTO dummy of 0.0318 is significant, and the estimated coefficients of the number and value of trades of –0.0080 and 0.0090, respectively, are marginally significant. These findings suggest that increased excess trading volume for bidders for the event window appears to be positively related to whether the bidder is TSE-listed and with higher trade values, and negatively related to a larger number of trades.

The estimated coefficients for the change in the excess trading volume regression are examined next for the bidder firms for the mark-up window. The estimated coefficient of the TORONTO dummy of –0.0100 is only marginally significant, and the estimated coefficient of the CROSS-BORDER dummy variable of –0.0109 is significant. These findings suggest that increased excess trading volume for bidders for the mark-up window appears to be negatively related to whether the bidder is TSE-listed and with whether the transaction is cross-border.

The estimated coefficients for the change in the excess number of trades regression are examined next for the bidder firms for the event window. Only the estimated coefficient of the TORONTO dummy of 0.0711 is significant. Thus, increased excess

number of trades for bidders for the event window appears to be positively related to whether the bidder is TSE-listed.

The estimated coefficients for the change in the excess number of trades' regression are examined next for the bidder firms for the mark-up window. Only two estimated coefficients are (marginally) significant; namely, the 0.0211 and –0.0180 for the CASH and HOT merger activity period dummies, respectively. These findings suggest that an increased excess number of trades for bidders for the mark-up window appears to be positively and negatively related to whether the transaction uses cash as a method of payment and whether the transaction occurs during a hot merger activity period, respectively.

5.3 Bid-Ask Spread Determinants

In this section, the impact of the announcement of a takeover on the bid-ask spread is assessed. The specific cross-sectional determinant model that is estimated to identify the determinants of the spread is as follows:

$$SP_{jt} = \alpha_0 + \beta_1 PRICE_{jt} + \beta_2 TORONTO_{jt} + \beta_3 CROSS\text{-}BORDER_{jt} + \beta_4 CASH_{jt} + \beta_5 STOCK_{jt} + \beta_6 HOT_{jt} + \beta_7 SUC_{jt} + \beta_8 VOLUME_{jt} + \beta_9 NTRANS_{jt} + \varepsilon_{jt} \quad (7)$$

In equation (7), SP_{jt} is the excess change in the spread on firm j during period t, where t is either the announcement [-1, +1], or the mark-up [+2, +20] period. The variable PRICE is the mid-point between the bid and the ask for each day. The rest of the variables are as defined earlier in the thesis. The analysis is again restricted to the event and the mark-up period given the results reported earlier. The results are in panels A and B of table 13 for the targets and bidders, respectively. The estimated coefficient for the potential

determinants of the bid-ask spreads for the two measures of trade activity are presented separately.

The estimated coefficients for the change in the excess spread regression are examined first for the target firms for the event and mark-up windows when the trading volume is included in the regression. The estimated coefficient for the dummy variable, CASH and HOT, and the trading VOLUME variable are –0.1515, -0.1457, and –0.0519, respectively, and are significant for the announcement window for the targets. These findings suggest that the excess change in the spreads decrease for companies that receive an offer in cash and/or an offer in a hot merger activity period, and with a higher trading volume. The estimated coefficient of 0.0821 for the STOCK dummy variable is the only significant coefficient for the change in excess spread relationship for the mark-up window for the targets. This suggests that the changes in the excess spreads increase for companies that receive an offer in stock in the mark-up period.

The estimated coefficients for the change in the excess spread regression are examined next for the targets for the event and mark-up windows when the number of trades is included in the regression. The estimated coefficients for the dummy variable, CASH and HOT, are a (weakly) significant –0.1323 and a significant –0.1513, respectively, for the announcement window for the targets. These findings suggest that excess spread decreases for companies that either receive an offer in cash and/or an offer in a hot merger activity period. The estimated coefficients of the dummy variables, STOCK and SUCCESSFUL, and the number of trades are 0.0902, -0.0832, and –0.0123, respectively, and are (marginally) significant for the mark-up window for the targets. These findings suggest that excess spreads increase for companies that receive an offer in stock and decrease for companies of successful transactions and higher number of trades.

The estimated coefficients for the change in the excess spread regression are examined next for the bidder firms for the event and mark-up windows when trading volume is included in the regression. The estimated coefficients for the variable PRICE and the dummy variable HOT are –0.0040 and –0.1305, respectively, and are significant for the announcement window for the targets. These findings suggest that excess changes in spreads decrease for higher stock prices and/or an offer in the hot merger activity period. This result is consistent for bidders with Demsetz (1968), Tinic and West (1972), and Benston and Hagerman (1974), who demonstrate that spread is related to share price. The estimated coefficient of 0.0020 for the PRICE variable is the only significant coefficient for the change in excess spread relationship for the mark-up window for the targets. This suggests that changes in excess spread increase for companies with higher stock prices in the mark-up period.

The estimated coefficients for the change in the excess spread regression are examined next for the bidder firms for the event and mark-up windows when the number of trades is included in the regression. The two estimated coefficients for the variable PRICE and the dummy variable HOT are –0.0045 and –0.1374, respectively, and are significant for the announcement window for the targets. These findings suggest that excess changes in spreads decrease for higher stock prices and/or an offer in a hot merger activity period. The estimated coefficient of 0.0023 for the PRICE variable is the only significant coefficient for the change in excess spread relationship for the mark-up window for the targets. This suggests that changes in excess spread increase for companies with higher stock prices in the mark-up period.

Overall, the analysis of the determinants of the change in excess trading activity and spreads generally support hypotheses 3 and 5. The main determinant of the market impact

is definitely the method of payment. For the targets, cross-border transactions and merger market activity are significant determinants of the market impact of mergers and acquisitions. In addition to these two characteristics, the success of a bid also is a significant determinant of the market impact of mergers and acquisitions for bidding firms.

6. CONCLUDING REMARKS

This paper examines the market impact of mergers and acquisitions on TSE-listed firms. Special attention is devoted to the effect of the method of payment on price and trade behavior around the announcement of takeovers. The analysis is based on a representative sample of mergers and acquisitions from the period from 1991 to 2001. On average, both bidding and target firms experience significant abnormal returns prior and at the announcement of the bid, and a significant decline in the mark-up period. However, the characteristics of many merger partners, such as method of payment and the intensity of merger activity, have a strong impact on the market response to the announcement of takeovers.

Significantly higher abnormal returns are identified when the offer is made in cash rather than stock. For the bidders, the abnormal return at the announcement of stock offers is negative and significant. Stock offers are not as interesting for the shareholders since they indicate that either the stock price of the bidding firm is overvalued or that managers are uncertain about the future outcome of the transactions. This is referred to in the literature as the information asymmetry hypothesis. A significant difference also is found in trading activity and the size of the bid-ask spread between cash and stock offers. The regression coefficient of the cash variable is significant in most of the cross-sectional

regressions. Overall, the method of payment is an important determinant of the change in excess trading volume, the number of trades, and the size of the spread for both bidders and targets.

Higher abnormal returns are associated with cross-border versus within-border takeovers. A possible explanation is the potential of greater information asymmetry between two firms that are not from the same country. Therefore, the abnormal returns for the shareholders of targets are higher when the offer is from a foreign bidder compared to an offer from a TSE-listed bidder. Consistent with this finding, the dummy variable for cross-border transactions is significant in explaining the excess change in trading volume around fusion activities. Excess changes in trading activity occur for bidders when both merging partners are listed on the TSE. This reinforces the conclusion with regard to the level of information associated with cross-border versus within-border bids.

The sample contains a large number of transactions in both hot and cold merger activity periods. The method of payment is found to be a more important determinant of market impact than the level of merger market activity. Nevertheless, the dummy variable hot is highly significant in explaining the excess change in the spread for both bidders and targets around the announcement of takeovers. No significant differences in the various measures of market reaction are found between successful and unsuccessful transactions.

Future research should examine the long-term impact of Canadian mergers and acquisitions that occurred in the late 1990's. From an ex post perspective, many of these combinations, especially in the high-tech sectors, did not prove to be successful. A post mortem analysis of these takeovers may reveal some very interesting lessons. Another

interesting issue is the market impact of failed takeover bids. Based on the information asymmetry hypothesis, the impact on the announcement date should diametrically vary for successful and unsuccessful firm combinations. Finally, a comparison of the market impact of mergers and acquisitions between TSE- and NYSE-listed firms may provide further insight into the exchange effect puzzle.

Table 1. Sample Size Reduction from Implementation of Various Screens

The reduction in the sample size from the implementation of various screens is detailed in this table.

Number of acquisitions from 01/01/1991 to 31/12/2001 that are listed on the TSE	9175
Subtract: Acquisitions with a transaction value under 25 million USD	7495
Acquisitions remaining for analysis	1680
Firms remaining	1779
Subtract:	
Firms with confounding events	1039
Missing data on CFMRC	225
Thin trading (More than 20% of observations missing)	18
Final number of Firms	**497**

Table 2. Sample Description by Payment Method and Locale of Parties to the Transaction

This table reports the number of bidders and targets using each method of payment. The methods of payment are Cash, Stock, and Mixed. Toronto-Toronto refers to transactions where both firms are listed on the TSE. Toronto-Canada refers to transactions where either the bidder or the target is a Canadian firm not listed on the TSE and the other firm is listed on the TSE. Toronto-Cross Border refers to a transaction where one firm is listed on the TSE and the other firm is from a foreign country.

Panel A: For Target Firms				
Geographic locale of participants	**Cash**	**Stock**	**Mixed**	**Total**
Toronto - Toronto	28	33	25	86
Toronto - Canada	33	8	12	53
Toronto - Cross Border	37	26	13	76
Total	98	67	50	215
Panel B: For Bidding Firms				
Geographic locale of participants	**Cash**	**Stock**	**Mixed**	**Total**
Toronto - Toronto	30	30	21	81
Toronto - Canada	66	15	22	103
Toronto - Cross Border	58	13	27	98
Total	154	58	70	282

Table 3. Abnormal Returns for the Shareholders of Bidders and Targets

The mean abnormal returns are presented in percent for the four different event windows in this table. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively. The median and the numbers of positive and negative abnormal returns also are presented.

Period	Relative Time	Targets	Bidders
Announcement	**[-1, +1]**		
Number of firms		215	282
Mean		0.1624 ***	0.0144 ***
Median		0.1265	0.0026
Number of positive		188	151
Number of negative		27	131
Run-up	**[-20, -2]**		
Number of firms		215	282
Mean		0.0422 ***	0.0308 ***
Median		0.0332	0.0057
Number of positive		127	150
Number of negative		88	132
Mark-up	**[+2, +20]**		
Number of firms		215	282
Mean		-0.0145 **	-0.0171 **
Median		-0.0169	-0.0137
Number of positive		82	123
Number of negative		133	159
Event	**[-5, +5]**		
Number of firms		215	282
Mean		0.1729 ***	0.0272 ***
Median		0.1498	0.008
Number of positive		184	149
Number of negative		31	133

Table 4. Abnormal Returns for Transactions Classified by Method of Payment

The abnormal returns are reported below for bidders and targets for the three different methods of payment and four different studied windows. These methods of payment are Cash, Stock, and Mixed. The abnormal returns reported in this table are percentages. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

		Targets			Bidders		
Studied Windows		Cash	Mixed	Stock	Cash	Mixed	Stock
Announcement	(-1, +1)	0.1898***	0.1511***	0.1310***	0.0227***	0.0151	-0.0078
Run-up	(-20, -2)	0.0454***	0.0273	0.0487**	0.0249**	0.0312*	0.0463*
Mark-up	(+2, +20)	-0.0182**	-0.0092	-0.0131	-0.0066	-0.0112	-0.0526**
Event	(-5, +5)	0.2016***	0.1629***	0.1384***	0.0288**	0.0345*	0.0143

Table 5. Abnormal Returns by Geographic Locale of the Involved Parties

This table reports the abnormal returns for the targets and bidders for each of four studied windows for each of three geographic locale classifications of the parties involved in the transaction. Toronto refers to the case where both firms are listed on the TSE. Canada refers to the case where one of the firms is listed on the TSE and the other is a Canadian but non-TSE-listed firm. Cross-border refers to a transaction where that one of the firms is listed on the TSE and the other is foreign. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

		Targets			Bidders		
Studied Windows		Toronto	Canada	Cross-border	Toronto	Canada	Cross-border
Announcement	[-1, +1]	0.1494***	0.1496***	0.1861***	-0.0060	0.0134*	0.0325***
Run-up	[-20, -2]	0.0295*	0.0506**	0.0508***	0.0166	0.0219*	0.0519**
Mark-up	[+2, +20]	-0.0051	-0.0151	-0.0247*	-0.0057	-0.0106	-0.0333**
Event	[-5, +5]	0.1634***	0.1613***	0.1917***	0.0052	0.0269*	0.0456**

Table 6. Change in Excess Trading Volume and Number of Trades

The change in excess trading volume and number of trades, and tests of their significance, are presented for both bidders and targets for four windows in this table. Trading volume is computed as the change in the log (1+Volume), and Ntrans is computed using the change in log (1+ Number of transactions). The change in each excess trade activity metric is the mean change for each event window minus the average change over the period for the window [-140, -40]. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Studied Windows		Targets		Bidders	
		Volume	Ntrans	Volume	Ntrans
Announcement	[-1, +1]	0.0738***	0.2012***	0.0190***	0.0413***
Run-up	[-20, -2]	0.0009	-0.0010	-0.0024	-0.0045
Mark-up	[+2, +20]	-0.0231***	-0.0301***	-0.0052**	-0.0087*
Event	[-5, +5]	0.0045	0.0339***	0.0190	0.0067

Table 7. Mean Change in Excess Trading Volume for Sub-samples Based on Method of Payment

This table presents the percent changes in Volume for both the targets and the bidders for the four studied windows for the sub-samples grouped by their method of payment of Cash, Mixed, and Stock. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Panel A - Targets				
Studied Windows		**Excess Change in Volume**		
		Cash	Mixed	Stock
Announcement	[-1, +1]	0.0926***	0.0524***	0.0613***
Run-up	[-20, -2]	-0.0057*	-0.0042	0.0158
Mark-up	[+2, +20]	-0.0233***	-0.0237***	-0.0225***
Event	[-5, +5]	0.0056	0.0007	0.0057
Panel B - Bidders				
Studied Windows		**Excess Change in Volume**		
		Cash	Mixed	Stock
Announcement	[-1, +1]	0.0007*	0.0057***	0.0045*
Run-up	[-20, -2]	0.0237	0.0285	0.0190
Mark-up	[+2, +20]	-0.0007	-0.0038***	-0.0024
Event	[-5, +5]	-0.0107	-0.0031*	-0.0052

Table 8. Mean Change in Excess Spreads for Targets and Bidders

The mean changes in excess spreads, and tests of their statistical significance, are reported in this table for targets and bidders for the four studied windows. Spread refers to the change in the daily closing quoted spread (Ask-Bid). Adjusted spread refers to the change in the spread when it is first divided by the closing share price. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Studied Windows		Targets – Change in Excess Spreads		Bidders – Change in Excess Spreads	
		Spread	Adjusted	Spread	Adjusted
Announcement	[-1, +1]	-0.1736***	-0.0431***	-0.0667***	-0.0191
Run-up	[-20, -2]	-0.0039	-0.0036	0.0336**	0.0079
Mark-up	[+2, +20]	-0.0513***	-0.0177***	0.0241	0.0107
Event	[-5, +5]	-0.0348*	-0.0160**	0.0289	0.0067

Table 9. Change in the Spreads by Method of Payment

The mean changes in the adjusted spreads, and tests of their statistical significance, are presented in this table for the four studied windows and the three sub-samples based on the method of payment. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Studied Windows		Targets – Change in Excess Spreads			Bidders – Change in Excess Spreads		
		Cash	Mix	Stock	Cash	Mix	Stock
Announcement	[-1, +1]	-0.0496**	-0.0341	-0.0398*	0.0029	-0.0202	-0.0802
Run-up	[-20, -2]	-0.0059	0.0023	-0.0048	0.0074	0.0038	0.0143
Mark-up	[+2, +20]	-0.0270***	-0.0186	-0.0028	0.0154	0.0029	0.0081
Event	[-5, +5]	-0.0266***	-0.0282*	0.0097	0.0121	-0.0053	0.0079

Table 10. Determinants of Cumulative Abnormal Returns for the Three Windows

This table reports the estimated coefficients and their significance for various cross-sectional regressions for targets and bidders for three studied windows. The three studied windows are the event [-1, +1], the run-up [-20, -2], and the mark-up [+2, +20] windows. The adjusted R-square values also are reported. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Independent Variables	Targets			Bidders		
	Event	Run-up	Mark-up	Event	Run-up	Mark-up
Toronto	0.0455	-0.0230	0.0076	-0.0171	-0.0090	0.0078
Cross-border	0.0661**	-0.0039	-0.0116	0.0181	0.0348*	-0.0372
Cash	0.0652**	0.0145	-0.0079	0.0033	-0.0009	-0.0085
Stock	0.0063	0.0250	-0.0044	-0.0192	0.0251	-0.0571
Successful	0.0070	0.0286	0.0015	0.0101	-0.0138	0.0391
Hot	0.0409*	0.0005	0.0009	0.0270**	0.0227	-0.0384
Deal Value	0.0105*	0.0029	-0.0021	-0.0016	0.0029	0.0009
R-square	0.4783	0.0719	0.0283	0.0829	0.0606	0.0890

Table 11. Determinants of Cumulative Abnormal Returns for Hot and Cold Periods of Merger Activity

The coefficient estimates and tests of their significance are reported for cross-sectional regressions of the abnormal returns for the abnormal returns for event window [-1, +1] for bidders and targets for hot and cold periods of merger activity are reported in this table. Periods of Hot and Cold merger activity are transactions from 1997 to 2001, and from 1991 to 1996. respectively. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Independent variables	Abnormal Returns			
	Targets - Hot	Targets - Cold	Bidders - Hot	Bidders - Cold
Toronto	0.0494	0.0440	-0.0136	-0.0194
Cross-border	0.0757*	0.0603	0.0373*	-0.0023
Cash	0.0510	0.1077*	0.0150	0.0022
Stock	0.0115	-0.0021	-0.0148	-0.0137
Successful	0.0449	-0.0189	0.0240	-0.0022
Deal Value	0.0102	0.0157*	-0.0013	0.0020
R-Square	0.4619	0.5264	0.1054	0.0530

Table 12. Determinants of the Change in Excess Trading Activity for the Shares of Targets and Bidders

The estimated coefficients and tests of their significance are reported in this table. The regression results are for cross-sectional regressions between two metrics of trade activity (namely, trading volume and number of trades) and various potential determinants for targets and bidders for two windows (namely, the event and mark-up windows). The results for the targets and bidders are presented in Panels A and B, respectively. Trading volume is measured by the change in the excess of the log of the volume for the studied window and that for the mark-up period. The number of trades is measured by the change in the excess of the log of the number of trades for the studied window and that for the mark-up period. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Independent variables	Trading Volume		Number of Trades	
	Event	Mark-up	Event	Mark-up
Panel A - Targets				
Intercept	0.0840***	-0.0319***	0.7671***	0.0480
Toronto	0.0199	-0.0002	0.1679**	0.0200
Cross-Border	0.0309**	0.0020	0.1360*	0.0265
Cash	0.0368**	0.0011	0.1351**	0.0032
Stock	0.0029	-0.0006	-0.0018	-0.0023
Hot	-0.0006	-0.0024	-0.0032	0.0029
Trading Volume			-0.0613***	-0.0096*
Number of Trades	-0.0140**	0.0103***		
Deal Value	-0.0017	-0.0038	-0.0284	-0.0007
R-Square	0.0923	0.1325	0.1189	0.0302
Panel B - Bidders				
Intercept	-0.0047	-0.0001	0.0642	-0.0242
Toronto	0.0318**	-0.0100*	0.0711**	-0.0113
Cross-Border	-0.0074	-0.0109**	0.0314	0.0062
Cash	-0.0019	0.0055	-0.0202	0.0211*
Stock	-0.0028	0.0080	-0.0007	0.0198
Hot	0.0064	-0.0063	0.0236	-0.0180*
Trading Volume			-0.0063	0.0031
Number of Trades	-0.0080*	0.0018		
Deal Value	0.0090*	-0.0011	0.0018	-0.0044
R-Square	0.0519	0.0353	0.0273	0.0408

Table 13. Determinants of the Bid-Ask Spreads for Targets and Bidders

The estimated coefficient for the potential determinants of the bid-ask spreads for targets and bidders for the two measures of trade activity for the event and mark-up windows, and tests of their statistical significance are reported in this table. The results for the targets and bidders are reported in panels A and B, respectively. The two measures of trade activity are trading volume and the number of transactions. *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

Independent variables	Spread - Vol		Spread - Ntrans	
	Event	Mark-up	Event	Mark-up
Panel A - Targets				
Intercept	0.5088*	0.1978	0.0714	0.0507
Price	-0.0007	0.0006	0.0010	0.0015
Toronto	0.0357	0.0613	0.0242	0.0580
Cross-Border	0.0894	0.0083	0.0805	0.0110
Cash	-0.1515**	-0.0091	-0.1323*	-0.0048
Stock	-0.0017	0.0821*	0.0242	0.0902*
Hot	-0.1457**	-0.0169	-0.1513**	-0.0155
Successful	0.0146	-0.0782	0.0093	-0.0832*
Number of Trades			-0.0474	-0.0310*
Trading Volume	-0.0519**	-0.0213		
R-Square	0.0942	0.0750	0.0821	0.0776
Panel B - Bidders				
Intercept	0.0130	0.1010	0.0292	0.0523
Price	-0.0040**	0.0020**	-0.0045**	0.0023**
Toronto	-0.0013	-0.0152	0.0001	-0.0173
Cross-Border	0.0208	-0.0345	0.0171	-0.0333
Cash	-0.0260	-0.0350	-0.0275	-0.0340
Stock	-0.0361	-0.0049	-0.0410	-0.0024
Hot	-0.1305**	0.0107	-0.1374***	0.0141
Successful	0.0150	-0.0025	0.0134	-0.0021
Number of Trades			0.0182	-0.0123
Trading Volume	0.0056	-0.0075		
R-Square	0.0484	0.0220	0.0508	0.0238

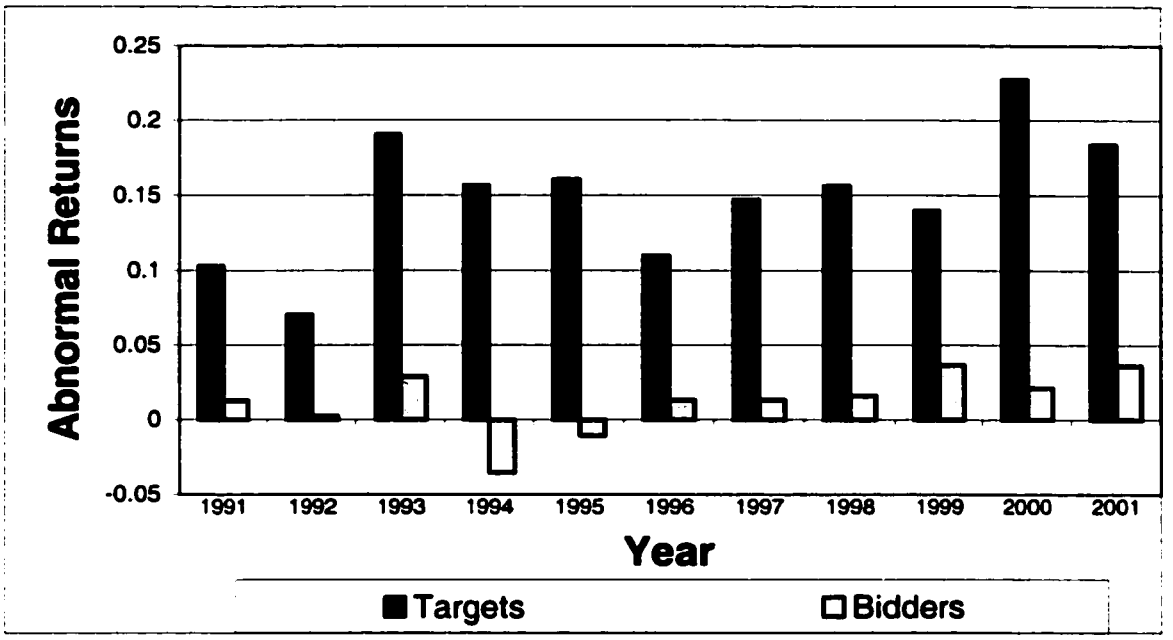

Figure 1. Mean Abnormal Returns for Each Year

This figure depicts the abnormal returns by year for both targets and bidders.

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