

**The Impact of Merger and Acquisition Announcements on
Prices of Canadian Real Estate Sector**

by

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requirements for the degree of Master of Finance

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Abstract

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The purpose of this paper is to examine whether or not the Merger and Acquisition (M&A) announcements affect the stock prices of Canadian real estate sector and if investors can obtain abnormal return based on these M&A announcements. A sample of 39 M&A announcements released by 25 publicly traded real estate firms during 2011 and 2012 are selected in the sample. By applying the market model, Average Abnormal Return Model (AAR) and Average Cumulative Abnormal Return Model (ACAR), the outputs show that the Canadian real estate sector is efficient in semi-strong form and investors cannot obtain abnormal returns from the M&A announcements released by these firms. Also, the M&A activities have no impact on Canadian real estate firms based on the selected sample.

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Chapter 1

Introduction

1.1 Background

1.1.1 M&A in Canadian Real Estate Sector

Real estate has been the most active industry in Canadian Merger and Acquisition (M&A) activities. According to the Financial Post Crosbie, in 2011, Merger & Acquisition activities in Canadian real estate sector, recorded 233 transactions worth \$18,636 million, 225 transactions worth \$27,544 million in 2012, and 69 transactions worth \$11,524 million in the first quarter of 2013. Firms are cautious about the stock market reactions to their M&A announcements and investors are eager to know if any opportunity exists for them to obtain abnormal returns from M&A announcements in the real estate sector in Canada.

1.1.2 Toronto Stock Exchange (TSX)

Toronto Stock Exchange (TSX) is the largest stock exchange in Canada. The TSX provides issuers with the opportunity to raise capital, and allows domestic and

international investors to have access to Canadian equity market. A variety of securities are listed on the TSX, including conventional securities and equity-related products, such as income trusts, exchange traded funds and investment funds. According to the official web site of the TSX, as at May 31, 2013, 33.9 billion shares valued C\$501.7 billion trade on the TSX, and a total of 1568 issuers who have raised C\$13,860.1 million equity capital are listed on the TSX. The TSX is divided into seven sectors, including mining, energy & energy services, clean technology, life sciences, technology, diversified industries, and real estate.

1.1.3 The Canadian Real Estate Sector

Real estate is one of the most active sectors of the TSX and the TSX Venture Exchange (TSXV). From the data provided by the TMX Group Inc., the parent company of the TSX and the TSXV, in the year of 2012, 13 new real estate firms came to list on the exchanges, and a total of 84 real estate firms with market capitalization of \$75 billion trade on the TSX and the TSXV. Over \$7.2 billion equity capital was raised and the real estate sector took up over 15% of total IPO issuance.

Up to the first quarter in 2013, six IPOs have been completed and over \$2.0 billion equity capital has been raised in the real estate sector. Moreover, the biggest IPO in the first quarter of 2013 on the TSX was a US Real Estate Investment Trust, which raised \$229 million in March. According to Ungad Chadda, the Senior Vice President of the TSX, the TSX together with the TSXV build one of the most active trading environment in the world for the public real estate firms, which leads real estate firms from all over the world come to Canada equity market look for listing opportunities and raise expanding capital.

As of June 2013, the real estate sector of the TSX consists of 62 issuers, who have raised C\$2,952.73 million equity capital, with total trading volume above 1069 million shares valued more than C\$20,888 million. The real estate companies include Real Estate Operating Companies (REOCs) and Real Estate Investment Trusts (REITs).

Real Estate Market at a Glance (Table 1.1)

June 2013	TSX Venture (TSXV)	TSX	TSXV and TSX
Number of Issuers	36	62	98
QMV (C\$)	825,361,333	76,382,869,087	77,208,230,419
New Listings	6	10	16
Equity Capital Raised (C\$)	307,320,022	2,952,732,404	3,260,052,426
Number of Financings	12	30	42
Volume Traded	79,109,873	1,069,906,414	1,149,016,287
Value Traded (C\$)	1,173,685,983	20,888,770,097	22,062,456,079
# of Trades	32,649	3,115,042	3,147,691

Source: http://www.tmx.com/en/listings/sector_profiles/realestate.html

1.2 Purpose of Study

This paper will examine whether or not the Merger and Acquisition (M&A) announcements will enhance the stock prices of Canadian real estate firms and if investors can obtain abnormal return on these M&A announcements. Thus, the purpose of this paper is to examine the market reaction to M&A announcements in Canadian real estate sector by finding the relationship between the M&A announcements and post-acquisition performance of Canadian real estate firms.

1.3 Need for study

According to the Financial Post Crosbie, real estate sector has been the most active sector among Canadian Merger and Acquisition activities. Firms who release the M&A announcements in Canadian real estate sector, would like to have a general idea of the stock price reactions to their M&A announcements. Also, investors are eager to know if they can earn abnormal return on these M&A announcements released by Canadian real estate firms, and make profit out of these information.

1.4 Statement of Problem

Forms of market efficiency are one of the major concerns of investors, since the form of market can determine if investors can obtain abnormal return from new information released by firms. Since real estate has been the most active industry in Canadian Merger and Acquisition activities and several M&A announcements are announced by real estate firms each quarter, forms of market efficiency will determine if investors can earn abnormal return and make profit on these M&A announcements. Under this situation, event study of M&A announcements can be applied to test the market

efficiency and examine if abnormal return exists after the M&A announcements.

Through the event study of M&A announcements, this paper will test the market efficiency of Canadian real estate sector on the TSX, based on the data from January 2011 to December 2012, and test if M&A announcements create value for Canadian real estate firms in terms of post-acquisition performance of stock prices.

1.5 Organization of the Study

In Chapter 2, literature review will consist of the definition of merger and acquisition (M&A), previous event studies on M&A, and the concept of efficient market hypothesis (EMH). In Chapter 3, the methodology used in this paper, including Market Model, Average Abnormal Return Model (AAR) and Average Cumulative Abnormal Return Model (ACAR), as well as the data sources will be introduced in detail. In Chapter 4, the empirical testing results will be illustrated and analyzed. Finally, conclusion, limitations and recommendation will be presented in Chapter 5.

Chapter 2

Literature Review

2.1 Merger and Acquisition (M&A)

A merger is the transaction that combines two firms together and leaves with only one surviving entity. An acquisition is one company purchases another company. There are three types of M&A, including horizontal merger, vertical merger, and conglomerate M&A. Horizontal merger is referred to as the acquiring firm and target firm are in the same line of business merge. In this case, M&A occurs in order to benefit from the economies of scale, which increasing the market power of firm, reducing cost, and increasing sales and profit margins. Vertical merger occurs when a firm purchases a supplier of its inputs or purchases a distributor or retailer for the product it produces. The rationale behind the vertical merger is to gain more complete control over the chain of production process. Conglomerate M&A is the combination of two irrelevant firms that aiming at diversifying capital investment.

Whether or not the M&A announcements can enhance the prices of firms still a debate

in academic studies. Some studies evidenced that the M&A announcements can destroy the value of firms. For example, Asquith (1983) and Agrawal et al. (1992) found that acquiring firms experienced negative abnormal returns for up to five years after the announcements of M&A. Mitchell and Stafford (1997) used the sample of M&A from 1960 to 1993 and found negative long-term abnormal returns for acquiring firms as well.

However, other studies found the opposite results and argued that M&A create value for firms. For instance, Asquith and Bruner et al. (1982) examined the impact of mergers on the wealth of shareholders in bidding firms and found the bidding firms earned significant gains during the twenty-one days before the announcement of their first four merger bids. They documented that the gains were greater prior to 1969 and shareholders of bidding firms also gain significantly after 1969. Bradley and E. Kim (1988) investigated the synergistic gains from corporate acquisitions and documented that a successful tender offer could enhance the combined value of the acquiring as well as target firms by an average of 7.4%.

This paper will focus on Canadian real estate firms and examine whether their M&A announcements are stock prices enhancing or stock prices destroying.

2.2 Event Studies on M&A

The most popular methodology to examine the impact of M&A announcements on firms' stock prices is the event study methodology (ESM). An event study averages the cumulative performance of stocks in different periods regarding to the event date, including the time period before, during and after the event date. By analyzing the difference between the returns that would have been expected if the event did not have occurred (the normal return) and the returns that were caused by the event (abnormal return), one can identify the impact of the event on stock prices.

The standard ESM is to estimate the abnormal returns generated by each M&A activities. More modern form of ESM, especially McCann (2004), tested the relationship between the target firms and total gains, between the target and acquirer to distinguish the underlying efficiency, and agency motives for M&A. Dusso et al.

(2007) found that event study model is useful for the ex-ante competition analysis of M&A and for the measurements of competitors' profits, the merging firms' profits and result of anti-competitive rents due to higher efficiency level.

Studies argue that the impact of M&A announcements on firm value is related to the form of payment in mergers. For instance, Loughran et al. (1997) used 947 acquisitions during 1970-1989 to test whether long-term shareholders can benefit from the capital acquisitions and examine the relationship between the form of payment in M&A and post-acquisition performance. They found that during a five years period after the M&A, on average, firms that experienced stock mergers obtain significantly negative excess returns of 25%, while firms that experienced cash mergers obtain significantly positive excess returns of 61.7%.

Other studies show that the firm size can also affect the gains from acquisition. Moeller and Stulz (2004) examined a sample of 12023 acquisitions by public firms during 1980-2001, they found that the equally weighted abnormal returns on

announcement is 1.1% while on average the shareholders of acquiring firms lose \$25.2 million on announcement. Additionally, the shareholders of acquiring firms earned nearly 2% higher return on announcements for small acquirers.

Regarding to the event studies on M&A that researched in the industry of real estate, McIntosh and Officer et al. (1989) used the data from July 1962 to December 1986 of 23 REITs that experienced takeover and tested the impact of M&A on specific target REITs. By using the market model to examine the performance of the REITs, the paper found that in successful acquisitions, the REITs obtain a significant abnormal return of 3.34% one day before the announcement of M&A, whereas the abnormal returns are insignificantly slight during the period of (+1, +30). Campbell, Ghosh and Sirmans (1998) used a sample of 25 transactions from January 1989 to January 1998 and calculated the three-day and five-day abnormal returns for purchasing the target REITs. The study found that acquiring REITs lose 1.1% whereas target shareholders gain 5.2% over the five-days period on the event day.

2.3 Efficient Market Hypothesis (EMH)

According to Malkiel and Fama (1970), market efficiency is defined as the market in which the security prices fully reflect all available information at any time so that the security prices provide accurate signals for resources allocation. There are three forms of market efficiency hypothesis, including weak form, semi-strong form, and strong form market efficiency.

Under weak form of market efficiency, security prices only reflect the information that be contained in the past stock prices. If weak form of EMH is valid, technical analysis or charting is ineffective and investors cannot obtain abnormal returns based on the historical information. Shmilovici et al. (2003) tested the weak form of EMH using 13 international stock indices and sliding window of 50, 75, and 100 daily returns, and found significantly compression in ten of the international stock index series, and found potential market inefficiency. Fama (1970) documented three models to test the weak form EMH, including the expected return or fair game model, the submartingale model, and the random walk model.

Random walk is an important concept of the EMH, which indicates the stock prices change randomly in an unpredictable way. If prices reflect all available information, any change in prices must be in reaction to new released information, and new released information must be an unpredictable surprise, thus stock prices change in reaction to new information must also move unpredictably. Brown (1953) examined the behavior market prices over time to examine the random walk theory and found a recurrent determinable pattern was not exist in the prices.

If market is efficient in semi-strong form, the security prices efficiently adjust to more information, which is publicly available information, such as the information in firms' annual report, announcements of stock split, M&A, etc. In this case, current security prices reflect the information contained in the past stock prices as well as the publicly available information. If semi-strong form of EMH is valid, investors cannot obtain abnormal returns based on the analysis of publicly available information. Studies of the semi-strong form of EMH focus on testing the speed of prices that adjust to new information released. The primary methodology is the event study methodology. The

first event study was adopted by Fama et al (1969), and the first be published was by Ball and Brown (1968). Event studies show the market appears to anticipate information like stock split and earning announcement, and most of the information is already adjusted into the prices before the announcement. Ariel (1972) tested the prices impact of secondary offerings while sellers may with non-public information, and the result of post-event price drift evidenced the market was not efficient in semi-strong form.

Under strong form of market efficiency, security prices reflect all available information regardless of the information is public or private. Under this form, investors and groups have monopolistic access to any information and the prices quickly and accurately adjust to reflect the insider information. If strong form of EMH is valid, beating the market based on the insider information is ineffective since the prices have already reflected the insider information. No form of analysis or search will consistently obtain abnormal returns.

Chapter 3

Methodology and Data Sources

3.1 Rationale

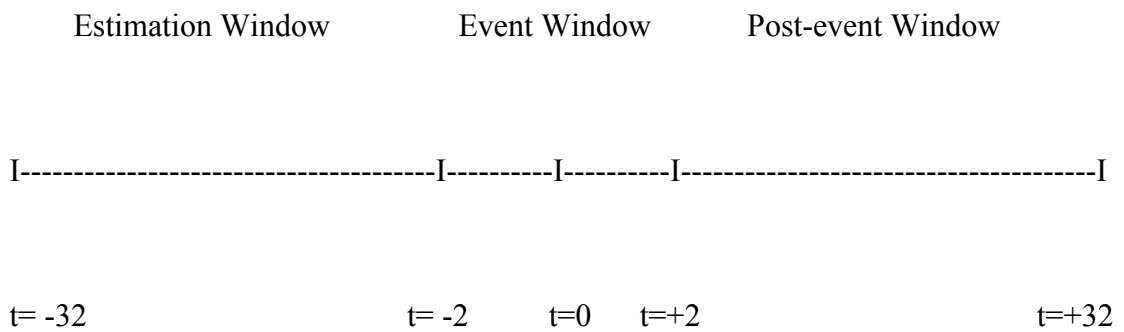
Event study methodology is adopted in this paper to examine the market reaction to M&A announcements released by Canadian real estate firms. The announcement date is defined as the event date, which is represented by $t=0$. A 5-days event window of 2 days before and after the event date ($t= -2$ to $t= +2$) is employed to monitor the stock performance around event days.

An estimation window (also called ex-event window) of 30 days, which is 32 days before the event date ($t= -32$) to 2 days before the event date ($t= -2$), as well as the market model is used to estimate the normal return of the stock that performs without the impact of M&A announcements. A post-event window of 30 days, that from 2 days after the event date ($t=+2$) to 32 days after ($t=+32$) the event date is used to examine the post-acquisition performance of sample firms.

The estimation window, event window and post-event window are illustrated in

Figure 3.1 as below:

Figure 3.1



Based on the correlation of the firms' stocks with the market index, abnormal return can be obtained by the abnormal return model, which differentiate the actual return on stocks in the market and the expected return calculated by the market model. Then the average abnormal return model and the average cumulative abnormal return model can examine the impact of M&A announcements on firms in different period of time and test the significance of the impact.

3.2 The model

3.2.1 Market Model

A single factor market model (Campbell et al., 1997) can be applied to test the semi-strong form EMH, which is:

$$R_{i,t} = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} + \varepsilon_{i,t} \quad (\text{Equation 3.1})$$

where:

$R_{i,t}$ = return on stock i during period t

$\hat{\alpha}_i$ = estimates of the intercept of the market model for stock i

$\hat{\beta}_i$ = estimates of the slope of the market model for stock i

$R_{m,t}$ = return on the Canadian market index during period t

(S&P/TSX Composite index is used as the market index in this paper)

$\varepsilon_{i,t}$ = error term, stands for the firm specific risk (also called unsystematic risk)

Four assumptions for the error term of the market model (Hill et al. 2011):

The expected value of the random error e: $E(e) = 0$

The variance of the random error e: $var(e) = \sigma^2$

The covariance between any pair of random errors e_i and e_j : $cov(e_i, e_j) = 0$

The values of e are normally distributed around the mean of zero: $e \sim N(0, \sigma^2)$

3.2.2 Abnormal Return (AR), Average Abnormal Return Model (AAR) and Average Cumulative Abnormal Return Model (ACAR)

In order to get the Abnormal Return (AR), Equation 3.2 can be applied:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t}) \quad (\text{Equation 3.2})$$

where:

$AR_{i,t}$ = the abnormal return on stock i during period t

$R_{i,t}$ = the return on stock i during period t

$R_{m,t}$ = the return on Canadian market index during period t

$\hat{\alpha}_i$ and $\hat{\beta}_i$ are estimates from Equation 3.1

Next step is to obtain Average Abnormal Return (AAR) from Equation 3.3:

$$AAR_t = \frac{1}{N} \sum AR_{i,t} \quad (\text{Equation 3.3})$$

Where $AR_{i,t}$ is the abnormal return on stock i during period t got from Equation 3.2 and N stands for the number of stocks.

To test the semi-strong form EMH, a T-test can be used. Null hypothesis is that:

$H_0: AAR_t=0$ (which means the market is efficient, investors can not obtain

abnormal return from information released by firms in the market). Alternative

hypothesis is that: $H_A: AAR_t \neq 0$ (which means the market is not efficient,

investors can obtain abnormal return from information released by firms in the

market). Therefore, if the null hypothesis is true, investors cannot get abnormal

return in the market after M&A announcements, semi-strong form EMH is

supported. On the contrary, if null hypothesis is rejected, investors can get

abnormal return after M&A announcements, the market is not efficient in

semi-strong form.

Finally, Cumulative abnormal return (Equation 3.4) and Average Cumulative

Abnormal Return (Equation 3.5) illustrated as follows can examine the impact of

M&A announcements on Canadian real estate firms:

$$CAR_{i,t} = CAR_{i,t-1} + AR_{i,t} \quad (\text{Equation 3.4})$$

$$ACAR_t = \frac{1}{N} \sum CAR_{i,t} \quad (\text{Equation 3.5})$$

Similarly, the T-test can be used. Null hypothesis is that: $H_0: ACAR_t=0$. (Cumulative abnormal return does not exist in the market). Alternative hypothesis is that: $H_A: ACAR_t \neq 0$. (Cumulative abnormal return exists in the market). If the null hypothesis is true, the market is efficient. Otherwise, if the null hypothesis is rejected, the market is not efficient.

3.3 Data Description and Sources

There are totally 62 real estate firms trading on the TSX. When collecting sample data, this paper selects the sample firms and events based on the following criteria:

- (1) The firm is a publicly traded firm in the real estate sector of the TSX.

(2) The firm has announced M&A activities during January 2011 to December 2012.

The focus is on the acquiring firms and the M&A activities should be completed.

(3) Each M&A announcement has sufficient stock price observations in the period of

$t = (-32, +32)$ to apply the estimation and test.

(4) This paper just selects the first M&A announcement that without multiple event

during the period of $t = (-32, +32)$ for each firm in each year. Reasons to be

explained as follows:

Since M&A activities are extremely frequent in the real estate sector for many firms.

For example, according to the Financial Post Crosbie Merger & Acquisition in Canada

database, the Artis Real Estate Investment Trust has announced 33 completed M&A

activities during 2011 and 2012. Also, for many firms, they released more than one

M&A announcements within one day. The overlapping events are serious in the real

estate sector during the testing period. These overlapping events might have impact on

each other and affect the accuracy of the study results. Thus, this paper just selects the

M&A announcement that was the only event during the whole estimated time. That is to say, during the period of 65 days (-32, +32), the M&A announcement is the only event occurred that might affect the prices of the firm. Also, there is only one event in each year for each firm.

Based on the above criteria, 39 M&A announcements released by 25 public trading real estate firms are selected in the sample, among which 14 firms has two selected M&A announcements in 2011 and 2012 respectively. All 39 M&A announcements and the related firms are listed in Appendix A.

Microsoft Excel and STATA are used to get the testing result. Also, mainly two data files are used in this paper. The first one is the event-date data, which includes the acquirers' name and the announcement date. The other is stock data, which includes acquirers, daily stock return of the firms, daily stock return of the market index and date.

The data of daily stock prices of firms and the market index (S&P/TSX Composite index) are obtained from the official website of Yahoo Finance:

<http://ca.finance.yahoo.com/>

Data of the M&A activities of individual firms including announcement date are got from the Financial Post Crosbie Merger & Acquisition in Canada database under the university library resource of FPinfomart.

Chapter 4

Analysis of Results

4.1 Overview

This chapter will illustrate and analyze the empirical testing results, including the regression analysis of the market model across all the sample data, average abnormal return (AAR) analysis in different period of time, and average cumulative abnormal return (ACAR) analysis during the event window for 39 selected M&A activities in the sample. All 39 M&A announcements and the related firms are listed in Appendix A. Microsoft Excel and STATA are used to do the empirical study.

4.2 Regression Analysis of the Market Model

Table 4.1 illustrates the output of the regression testing on market model as follows:

Regression Testing on Market Model (Table 4.1)

```
. regress ret market_return
```

Source	SS	df	MS			
Model	.038509527	1	.038509527	Number of obs =	2535	
Residual	.403964357	2533	.000159481	F(1, 2533) =	241.47	
Total	.442473884	2534	.000174615	Prob > F =	0.0000	
				R-squared =	0.0870	
				Adj R-squared =	0.0867	
				Root MSE =	.01263	

ret	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
market_ret~n	.4076897	.0262361	15.54	0.000	.3562433	.4591362
_cons	.0006364	.0002508	2.54	0.011	.0001445	.0011282

The market model based on Equation 3.1 can estimate the relationship between the return on stocks of the selected real estate firms and the return on the market index, which is the S&P/TSX Composite index in this paper. This simple linear regression can assess the sensitivity of the stocks to the change in the market index and test if the stocks move in the pattern of the market index.

As shown in the regression result, α is the constant intercept of the market model, which is 0.0006364. β is the slope of the market model, which equals to 0.4076897 and indicates the sensitivity of the stocks to the market index. This result indicates that when return on the market index changes by one percentage point, the return on stocks change by nearly 0.4 percentage point in the sample. Also, the P-value for β is zero

at the five percent level of significance indicates that β is positive and statistically significant at 95 percent confidence level. Thus, change in the sample stocks is positively sensitive to the change in the market index.

R-squared is widely used in the analysis of linear regression, which indicates the proportion of variation in the dependent variable (return on stocks) explained by the explanatory variable (return on the market index). Thus, R-squared is an overall measurement of the goodness of fit of the linear regression in a sample of data. Based on the single factor market model, the result shows that R-squared equals to 0.087 and adjusted R-squared is 0.0867, which means that 8.7% of the variation in the return on stocks is explained by the return of the market index. Thus, movement of stocks in the sample does not in line with the movement of the market index.

4.3 Average Abnormal Return (AAR) Analysis

By differentiate the actual return on stocks and the expected return estimated from the market model using the estimates of $\hat{\alpha}$ and $\hat{\beta}$ for each firm in the estimation

window, abnormal return for each firm at time t are generated. The analysis of average abnormal return (AAR) can test whether the market is efficient, whether the announcements of M&A will affect the prices of selected real estate firms and how can the M&A activities affect these firms.

4.3.1 Overall Analysis of AAR in the Sample

Table 4.2 is the output of one-sample T-test on daily abnormal return for all selected real estate firms during their estimated period of $t=(-32, +32)$:

T-test on Daily Abnormal Return for All Sample Firms (Table 4.2)

One-sample t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
ar	2535	-.0001272	.0002507	.0126243	-.0006189	.0003645

mean = mean(ar) t = -0.5073
Ho: mean = 0 degrees of freedom = 2534

Ha: mean < 0 Ha: mean != 0 Ha: mean > 0
Pr(T < t) = 0.3060 Pr(|T| > |t|) = 0.6120 Pr(T > t) = 0.6940

As described before, abnormal return for each firm at time t are generated. Then, the one-sample T-test on daily abnormal return for all sample firms can test if the market is efficient.

Here the T-test is used. Null hypothesis is that: $H_0: AAR_t=0$ (on average, abnormal return does not exist in the market, thus the market is efficient). Alternative hypothesis is that: $H_A: AAR_t \neq 0$ (on average, abnormal return exists in the market, the market is not efficient). If P-value is greater than 0.05 ($P > 0.05$), the null hypothesis should not be rejected. If P-value is less than 0.05 ($P < 0.05$), the null hypothesis is rejected. As shown in Table 4.2, the P-value equals to 0.612, which is bigger than 0.05 and indicates that the null hypothesis should not be rejected. Thus, the market is efficient in semi-strong form, and on average investors cannot obtain abnormal return from the M&A announcements released by Canadian real estate firms.

4.3.2 Comparison of AAR in the Ex-event Window and Event Window

Table 4.3 is the result of one-sample T-test of the difference between aar_0 (the average abnormal return in event window) and aar_1 (the average abnormal return in ex-event window):

T-test of the Difference between aar0 and aar1 (Table 4.3)

One-sample t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
aar0_1	39	.0002353	.0010598	.0066186	-.0019102	.0023808

mean = mean(aar0_1) t = 0.2220
 Ho: mean = 0 degrees of freedom = 38

 Ha: mean < 0 Ha: mean != 0 Ha: mean > 0
 Pr(T < t) = 0.5872 Pr(|T| > |t|) = 0.8255 Pr(T > t) = 0.4128

By comparing aar0 and aar1 for each event, 39 observations of aar0_1 (the difference between aar0 and aar1) are generated. T-test is used here. Null hypothesis is that: $H_0: AAR0_1=0$ (there is no difference between aar0 and aar1). Alternative hypothesis is that: $H_A: AAR0_1 \neq 0$ (there exists difference between aar0 and aar1). As shown in the output, the difference between aar0 and aar1 is 0.0002353, which is very small. Also, the P-value equals to 0.8225 and is greater than 0.05, which means null hypothesis should not be rejected. Thus, the difference between aar0 and aar1 is very little and is not statistically significant. Therefore, the announcements of M&A cannot enhance the prices of real estate firms in Canada.

4.3.3 Comparison of AAR in the Event Window and Post-event Window

Using the same logic as before, Table 4.4 demonstrates the difference between aar2 (the average abnormal return in post-event window) and aar0 (the average abnormal return in event window):

T-test of the Difference between aar2 and aar0 (Table 4.4)

One-sample t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
aar2_0	39	-.0005501	.0010537	.0065806	-.0026833	.0015831

mean = mean(aar2_0) t = -0.5220
Ho: mean = 0 degrees of freedom = 38

Ha: mean < 0 Ha: mean != 0 Ha: mean > 0
Pr(T < t) = 0.3023 Pr(|T| > |t|) = 0.6047 Pr(T > t) = 0.6977

As shown in Table 4.4, the difference between aar2 and aar0 is -0.0005501, which is negative but very small. The P-value equals to 0.6047 is bigger than 0.05, thus null hypothesis of $H_0: AAR2_0=0$ (there is no difference between aar2 and aar0) should not be rejected. Therefore, the change in average abnormal return in event window and post-event window is very slight and statistically insignificant. The announcements of M&A cannot improve the post-acquisition performance of selected real estate firms.

4.3.4 Comparison of AAR in the Ex-event Window and Post-event Window

Table 4.5 illustrates the Paired T-test of the difference between aar1 (the average abnormal return in ex-event window) and aar2 (the average abnormal return in post-event window):

Paired T-test of the Difference between aar1 and aar2 (Table 4.5)

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
aar2	39	-.0003148	.0003412	.0021306	-.0010055	.0003758
aar1	39	-1.91e-20	4.20e-20	2.63e-19	-1.04e-19	6.60e-20
diff	39	-.0003148	.0003412	.0021306	-.0010055	.0003758

mean(diff) = mean(aar2 - aar1) t = -0.9228
 Ho: mean(diff) = 0 degrees of freedom = 38
 Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
 Pr(T < t) = 0.1810 Pr(|T| > |t|) = 0.3619 Pr(T > t) = 0.8190

Since the ex-event window and the post-event window both have a time period of 30 days, the Paired T-test can test the difference in means of average abnormal return before and after the event for the period of 30 days. By comparing aar1 and aar2 for each M&A activity, we can test if the M&A activities can create value for Canadian real estate firms.

From the output of Table 4.5, the difference in means between aar2 and aar1 is

event window for all sample firms is observed as 0.0011764. P-value equals to 0.8255 is greater than 0.05. Thus, the null hypothesis of $H_0: ACAR_0=0$. (Average cumulative abnormal return does not exist during the event window) should not be rejected. Therefore, the test of average cumulative abnormal return during the event window gets the same result as before, that the Canadian real estate sector is efficient in semi-strong form and investors cannot obtain cumulative abnormal return in this market based on the released M&A announcements.

Chapter 5

Conclusion

The purpose of this paper is to examine whether or not the M&A announcements can enhance the stock prices of Canadian real estate firms and if investors can obtain abnormal return on these M&A announcements. By applying the Market Model, Average Abnormal Return Model (AAR) and Average Cumulative Abnormal Return Model (ACAR), 39 M&A announcements released by 25 public trading real estate firms during 2011 and 2012 are used to conduct the empirical research.

5.1 Conclusions

From the market model, by finding the relationship between the return on stocks of the selected firms and the return on the market index, which is the S&P/TSX Composite index in this paper, the results prove that changes in the sample stocks is sensitive to the change in the market index. However, movements of these stocks do not follow the pattern of the market index.

From the average abnormal return model, this paper gets four conclusions. First, by conducting the one-sample T-test of all abnormal returns during the period of $t=(-32, +32)$ for every events in the sample, the null hypothesis of $H_0: AAR_t=0$ (the market is efficient) cannot be rejected. Thus, the market is proved to be efficient in semi-strong form.

Second, by comparing the average abnormal return in event window (aar0) and the average abnormal return in ex-event window (aar1) for each event, the result shows that the difference between aar0 and aar1 is very small and is not statistically significant. The announcements of M&A cannot enhance the prices of real estate firms in Canada.

Third, by comparing the average abnormal return in post-event window (aar2) and the average abnormal return in event window (aar0) for each event, the output shows the announcements of M&A cannot improve the post-acquisition performance of selected real estate firms.

Fourth, by comparing the average abnormal return in ex-event window (aar1) and the average abnormal return in post-event window (aar2), the result demonstrates that the M&A activities do not create value for acquiring firms in Canadian real estate sector and investors cannot obtain significant abnormal return based on the M&A announcements released by these acquiring firms.

From the average cumulative abnormal return model, the cumulative abnormal return during the event window of $t=(-2, +2)$ of sample firms are tested, the conclusion is that the Canadian real estate sector is efficient in semi-strong form and investors cannot obtain cumulative abnormal return in this market based on the released M&A announcements.

5.2 Limitations and recommendations

The conclusions show that the market in Canadian real estate sector is efficient in semi-strong form and investors cannot obtain abnormal return from the M&A announcements released by these firms. Also, the M&A activities has no impact on

Canadian real estate firms based on the selected sample. However, there are three limitations in this paper.

Frist, although overlapping M&A announcement is excluded in the estimated period in the sample, many other factors can affect the stock prices as well. For instance, the fiscal policy released by the government, other announcements like dividend announcement, earning announcement, etc. Thus, M&A announcement is not the only and major factor that would affect the stock prices. Second, the sample size is relatively small and is just enough to meet the requirement to do the test. Thus, it is better to enlarge the sample size by choosing more sample firms and events. For example, the sample may not just focus on the TSX, other equity market in Canada like the TSXV can also be considered in the sample. Third, in the situation that the M&A activities are extremely frequent in Canadian real estate sector, in order to exclude multiple event in the estimated period, the length of the estimation window is relatively short, which might affect the accuracy of the market model. To improve this weakness, a larger sample of firms and events can also be helpful.

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APPENDIX A

COMPANY LIST

Announcement date	Acquirer name	Acquirer Ticker
2011-2-15	Partners Real Estate Investment Trust Northwest Healthcare Properties Real Estate Investment Trust	PAR-UN.TO
2011-3-1		NWH-UN.TO
2011-3-3	Morguard Corporation	MRC.TO
2011-3-9	BTB Real Estate Investment Trust Canadian Apartment Properties Real Estate Investment Trust	BTB-UN.TO
2011-3-24		CAR-UN.TO
2011-4-5	Leisureworld Senior Care Corporation	LW.TO
2011-4-29	Cominar Real Estate Investment Trust	CUF-UN.TO
2011-6-3	First Capital Realty Inc.	FCR.TO
2011-6-30	Melcor Developments Ltd.	MRD.TO
2011-7-15	KEYreit	KRE-UN.TO
2011-8-16	Calloway Real Estate Investment Trust	CWT-UN.TO
2011-8-17	Pure Industrial Real Estate Trust	AAR-UN.TO
2011-9-12	Brookfield Office Properties Inc.	BPO.TO
2011-11-22	Dundee Real Estate Investment Trust	D-UN.TO
2011-11-24	Northern Property Real Estate Investment Trust	NPR-UN.TO
2011-12-1	Brookfield Canada Office Properties	BOX-UN.TO
2011-12-7	Canadian Real Estate Investment Trust	REF-UN.TO
2011-12-14	H&R Real Estate Investment Trust	HR-UN.TO

Announcement date	Acquirer name	Acquirer Ticker
2012-1-10	Pure Industrial Real Estate Trust	AAR-UN.TO
2012-1-12	Leisureworld Senior Care Corporation	LW.TO
2012-1-25	InterRent Real Estate Investment Trust	IIP-UN.TO
2012-3-8	Crombie Real Estate Investment Trust	CRR-UN.TO
2012-3-15	Brookfield Office Properties Inc.	BPO.TO
	Northwest Healthcare Properties Real Estate Investment Trust	NWH-UN.TO
2012-3-30		
2012-5-23	H&R Real Estate Investment Trust	HR-UN.TO
2012-5-24	Partners Real Estate Investment Trust	PAR-UN.TO
2012-5-31	Calloway Real Estate Investment Trust	CWT-UN.TO
2012-6-1	Killam Properties Inc.	KMP.TO
2012-7-6	Artis Real Estate Investment Trust	AX-UN.TO
2012-7-17	Mainstreet Equity Corp.	MEQ.TO
2012-7-31	Cominar Real Estate Investment Trust	CUF-UN.TO
2012-8-3	Dundee Real Estate Investment Trust	D-UN.TO
2012-8-8	KEYreit	KRE-UN.TO
	Canadian Apartment Properties Real Estate Investment Trust	CAR-UN.TO
2012-8-31		
2012-8-31	Canadian Real Estate Investment Trust	REF-UN.TO
2012-10-31	Morguard Real Estate Investment Trust	MRT-UN.TO
2012-11-28	Dundee Industrial Real Estate Investment Trust	DIR-UN.TO
2012-11-30	Morguard Corporation	MRC.TO
2012-12-21	BTB Real Estate Investment Trust	BTB-UN.TO