

**STOCK REPURCHASE AND ITS EFFECT:
A CANADIAN PERSPECTIVE**

by

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ABSTRACT

This paper examines stock price behaviour surrounding announcements of stock repurchases made by Canadian firms from 2005 to 2007. Our analysis shows that stock prices in Canada go up in response to stock repurchase announcements on the announcement day and the following day. We also find that book value to market value and retained earnings to book value have significant explanatory power with regard to the increase in stock price because of the stock repurchase announcement.

Keywords: stock repurchase; Normal course issuer bids; stock returns; abnormal returns.

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SECTION 1: INTRODUCTION

Stock repurchase has emerged as the dominant method of distributing corporate cash flows in North America over the last 20 years. Compared with Canada, U.S. has longer history of stock repurchase program. The announced stock repurchase by U.S. corporations has increased from the \$6.6 billion of shares accounting for 4.8 percent of total earnings in 1980 (Grullon and Michaely, 2002) to the \$202.8 billion accounting for 41.8 percent of earnings in 1999. In 2005, constituent companies of the S&P 500 repurchased \$349 billion of shares. Interest in corporate repurchase programs is not limited to the United States, as repurchase activity worldwide has grown in recent years. The number of Canadian firms involved in open market repurchase activities increased steadily through the 1980s and 1990s, and in 1997 over 17% of the firms listed on the Toronto Stock Exchange (TSX) announced a repurchase. Compared with the traditional dividend distribution to investors, open-market shares repurchase in Canada surpassed dividends in 2000 and although declined relative to dividends in 2001, it surpassed dividend payment again in 2004. This suggests that the up trend in Canadian open-market share repurchase seems to be cyclical and is not a temporary trend.

Given the growth in repurchase activities worldwide, fresh evidence on the stock performance of the repurchasing firms is of interest. In this paper, we examine open market stock repurchase programs announced by firms trading on the Toronto Stock Exchange (TSX). Moreover, we utilize programs announced between January 2005 and June 2007, a time period that has record number of share repurchase programs. Our

sample contains 139 program announcements over the event period. Adopting an event window of 21 days, being 10 days prior to and 10 days after the announcement date (event date) and the event date, our paper attempts to identify significant abnormal returns for the repurchasing firms surrounding the event date. This analysis is supplemented with evidence of the factors that may have contributed to the effect of stock repurchase announcement on firms' stock prices. Specifically, we consider the issuer firms' book value to market value (BV/MV), retained earnings to book value (RE/BV) and percentage of repurchased shares over total shares outstanding as the potential contributing factors.

The rest of the paper is organized as follows. Section II surveys previous literature focusing on the response of stock price to the stock repurchase announcements and the reasons why firms repurchase. Section III outlines the framework guiding Canadian normal course issuer bids and recent changes to the rules and regulations. In Section IV, we discuss data and models used in our regression analysis as well as the results. Section V concludes.

SECTION 2: LITERATURE REVIEW

There are ample studies which have analyzed the responses of share prices to the announcements of firms' stock repurchases and have concluded that there are significant "announcement effects". Extant literature overwhelmingly finds a positive price reaction for firms around the announcement of a share repurchase program.

Previous Studies

Researchers have identified significant, positive abnormal stock return around U.S. open market repurchases announcement. Dann (1981) observes sizable and significantly positive returns realized by common stockholders of repurchasing firms within one day of the repurchase announcement. These positive value changes in common shares are permanent in that share prices do not return to their preannouncement date levels following expiration of the opportunity for stockholders to tender shares.

Comment and Jarrell (1991) finds an average abnormal announcement period return of 2.3% around U.S. open market repurchases and concludes that the increase in value is due to new earnings information signalled by the repurchase. They further conclude that firms tend to announce open-market repurchase plans following a decline in their share price, when their stock is more likely to be undervalued. By testing signalling, they find that announcement return is positively related to proportion sought in the repurchase and negatively related to pre-announcement stock returns.

Loomis (1985) conducted a survey in which he analyzed the shareholder returns of companies that had voluntarily repurchased substantial portions of their common stock between the years 1974 and 1983. Loomis compared their returns with the S&P 500 stock index and showed that the stock of the buyback companies showed an annual average return of 22.6% as compared to a return of only 14% on the S&P 500 stock index. He stated that the buybacks performed well for the shareholders only in cases where the stock was initially undervalued.

Ikenberry et al. (1995) finds that subsequent performance, especially for “value” firms, is sufficiently high that even investors who purchase after the announcement day, including the firm itself, can earn abnormal returns. This abnormal performance strongly suggests that these firms were in fact undervalued at the time of the announcement of the repurchase program.

Wansley and Fayeze (1986) studied the impact of share repurchase announcements on the returns of security holders of Teledyne Corporation. They found that positive abnormal returns accrued to common shareholders. They also found that subsequent share repurchase announcements did not diminish the absolute level or the significance level. They concluded that a wealth transfer takes place from bondholders to the shareholders that nullify previous contradictory evidence in this case.

Davidson and Garrison (1989) also studied the impact of share repurchases on the repurchasing firms' common stock returns for the years 1978 to 1983. They found that the firms that repurchased more than 18% of their stock had large cumulative abnormal returns (CAR) than those firms that repurchased less than 18%. They also found that firms which repurchased stock as a defense against takeovers had a negative reaction to

their stock price. They found that the most statistically significant returns were observed for those companies that purchased undervalued stocks as an investment. Denis (1990) confirmed the negative price response to a defensive share repurchase.

Table 1 provides a summary of the empirical findings of share repurchase announcement abnormal returns, which is reproduced from Schmidt (2006). In this table, results of abnormal returns are provided for both short and long-term event horizons as well as for both U.S. and Canadian markets.

Our Paper & Li and McNally (2007)

Our study has a Canadian market focus and is most closely related to Li and McNally (2007) who adopts the conditional event study approach to investigate why firms buy back shares and why the stock market responds favourably to repurchase announcements. The paper examines the open market share repurchases in Canada by firms listed on the TSX. It presents an overview of Canadian share repurchases, investigates why firms repurchase by focusing on five hypotheses, and how the stock market reacts to them, and contrasts the findings for Canada with those for the U.S. The paper finds that the market reacts more positively to repurchase announcements when firms claim that their shares are undervalued and when firms initiate new repurchase programs. Significant positive correlation between unexplained abnormal announcement return and the private information, which insiders use to guide their decision to repurchase, is observed. Another finding of the paper is that Canadian firms are more likely to buy back shares if they have greater free cash flows, lower market-to-book ratios, poor prior stock performance and if their insiders own a larger proportion of shares.

However, we substantially deviate from the studies referenced in this paper as we specifically examine the stock price response to the announcement over the most recent two year time period, thus provide fresh evidence of the effect of stock repurchase announcement. The reason for re-visiting the NCIB practice and its effect on the market of the issuer when older papers have analyzed this effect for periods such as 1987 to 2000 as in Li and McNally (2007) is a simple one. The numbers of Canadian issuers that have announced a NCIB in the past two years are down and the amount of stock repurchased has been declining from the record number in 2005 for Canadian issuers. The reason for this earlier record number is that large capitalized issuers have experienced windfall profits during that period especially financial and some commodity-oriented firms. However, credit tightening and rising Canadian dollar makes the time period under our study the most volatile over the past few years. Therefore a re-examination of the effect of the NCIB is warranted to see if the effect of repurchase announcement on the market of the issuer is greater, lesser or similar to the previous analysis.

As explained in Li and McNally (2000), contrary to the U.S. open market repurchases, Canadian NCIB must be completed in one year and are restricted in size to a legal maximum proportion of shares. In addition, firms tend to announce the legal maximum that they are entitled to buy back (versus a target proportion as in the U.S.) and thus the announcement is less informative. Consequently, the announcement is the only information and the “signal”. This is the reason why Li and McNally (2000) used a conditional event study (in Li and McNally (2007) as well), instead of a standard event study (which uses the target proportion as a continuous signal), to test whether NCIB announcement are discrete signals. The methodology used in Li and McNally (2000)

follows Acharya (1988), which argues that the conditional event study is the only correct way to test for a discrete signal, because it estimates the announcement period return conditional on the insiders' decision to signal. In a signalling model, the price reaction is conditional on the signal, and the insiders' decision to signal is the outcome of a rational choice based on their private information.

In our paper, while we agree with Li and McNally (2000) on testing the NCIB announcement as a discrete signal, we do not adopt the non-NCIB samples as did in their paper. Li and McNally (2000) and Li and McNally (2007) added non-NCIB samples in their study. Their argument comes from Prabhala (1997) which states that a conditional information structure is not sufficient to assure the superiority of the conditional event study and firms that did not engage in the activity should form another necessary condition. Even though this may be a logical conclusion based on the theory, in reality, events other than NCIB announcement can potentially affect the firms' stock price. Non-NCIB events such as mergers and acquisition, changing of management or quarterly earnings announcement have historically caused significant price reaction to the firms. By including non-NCIB samples in our study thus may not provide useful information for the purposes of analyzing the effect of NCIB announcement because abnormal return may be observed from non-NCIB samples as a result of non-NCIB events. We are also questioning the non-NCIB sample selection method used in Li and McNally (2000), where they randomly selected firms covered by Standard and Poor's and further assigned a fictitious announcement date for each non-NCIB firm, chosen randomly from a weekday in the sample period. Again, the non-NCIB events may distort the results.

With a focus on only NCIB firms, our study adopts a 21-day event window, being 10 days prior to and after the announcement day (event date) plus the event date. As illustrated in Table 1, the majority of the previous studies that focused on short-term abnormal return adopted an event window of 1 or 2 days prior to and after the event date. Our paper extends the event window to a slightly longer horizon in order to capture the lags, if any, of the announcement effect on the firms' stock prices. We do not intend to study the long-term abnormal return in our paper. Fama (1997) suggests that many studies focus on returns in a short window (a few days) around a cleanly dated event. An advantage of this approach is that because daily expected returns are close to zero, the model for expected returns does not have a big effect on inferences about abnormal returns. The assumption in studies that focus on short return windows is that any lag in the response of prices to an event is short-lived. Fama's paper drawn into question the results of several studies that examine long-run stock performance because of the sensitivity of the results to the methods used to calculate abnormal returns. The paper concludes that "long-term return anomalies are fragile" and "tend to disappear with reasonable changes in the way they are measured". Due to the controversies surrounding the methodologies used in studies with a long-term horizon focus, we choose to examine the short-term performance of firms' stocks. In our opinion, to capture fully the effect of repurchase announcements only on firms' stock prices, a shorter event window is warranted.

Cross-Sectional Analysis

Another important component of our paper is the cross-sectional multiple regression to identify the influencing factors for abnormal returns around NCIB

announcements. We did not utilize the same factor regression model as in the previous studies. Instead, we adopted the BV/MV and NCIB shares to total shares outstanding factors from previous studies and added an additional factor of retained earnings to book value, which we believe is more relevant for analyzing the signalling effects of the stock repurchase announcement.

Ikenberry, Lakonishok and Vermaelen (2000) studies whether managers execute repurchases strategically in response to market movements and finds that undervaluation is an important consideration for share repurchases in Canada. Their findings are consistent with earlier studies on the US market. Using Fama-French (1993) three-factor model, their paper examines factors including monthly excess return to the TSX, size and book-to-market and shows an abnormal return of 0.59% per month over a three-year period following the announcement. Consistent with undervaluation being a motivating factor, they observed poor preannouncement returns and subsequent out-performance. Their results concludes that Canadian value stocks that announce repurchases experience abnormal returns of 0.76% per month, whereas the comparable return for growth stocks is only 0.28% per month.

Another paper adopted factor analysis is Hatakeda and Isagawa (2004). The paper use probit and logit models to identify the factors affecting a Japanese firm's decision on repurchase execution and concludes that firm that experiences a large stock price decline will be more likely to decide to buy back its shares. Factors studied in this paper include target proportion of shares to be repurchased, pre-announcement period return, firm size and firm profitability (ROA). Positive relationship was identified for the proportion of

shares sought according to the repurchase announcement, and negative relationship for pre-announcement cumulative abnormal return, firm size and ROA.

McNally (1999) examines a more rigorous signalling model and finds that the returns are positively related to the quantity of shares targeted, the stock's volatility and the size of insider holdings.

Grullon and Michaely (2004) examine a free cash flow hypothesis, and find that announcement returns are positively related to the proportion sought and cash (for low market-to-book firms), and negatively related to the market-to-book ratio and size.

Li and McNally (2007) criticized previous studies of U.S. announcement returns, by citing that the studies have tended to test individual hypotheses in isolation. In their paper, they studied five hypotheses – earnings signalling, undervaluation, optimal capital structure, dividend substitution and agency costs. However, their results indicate that only a few predict an abnormal announcement period return. Firms are more likely to buy back shares if they have greater free cash flows, lower market-to-book ratios, poor prior stock performance, and their insiders have large shareholdings.

The book value-to-market value (BV/MV) factor has been well recognized as an indicator of the level of undervaluation of NCIB stocks in the market. Several previous studies has identified undervaluation as the reason of why firms repurchase, hence making this factor the most powerful factor in the signalling effect of stock repurchase.

The NCIB shares to outstanding shares factor indicates the level of floating shares for the firms, and thus if issuer firms have low level of floating supply, it is expected to have a positive effect on abnormal returns. Comment and Jarrell (1991) and Ikenberry et

al. (1995) reported that, in the U.S. markets, higher proportions of target shares were associated with larger abnormal returns in response to repurchase announcements.

We adopted a third factor, retained earning-to-book value (RE/BV), which indicates if the company has accumulated capacity to execute the stock repurchase program. RE/BV, in our opinion, is a good proxy for the sustained profitability of the firm. If the firm has high RE/BV, then it is expected that the signalling effect will positively affect the abnormal returns of the firm. Our one factor regression analysis reveals that RE/BV has the best explanatory power with regard to the abnormal returns.

SECTION 3: CANADIAN OPEN MARKET STOCK REPURCHASE AND WHY FIRMS REPURCHASE

OVERVIEW

The most common mechanism firms use to repurchase stocks in Canada is referred to as “Normal Course Issuer Bids” (NCIB). The primary oversight mechanism for these programs is provided by the exchange where the firms’ stock trades. Although share repurchases in Canada are governed by the provincial securities acts, if carried out through the exchange, they are subject to the exchange’s general by-laws, which supersede the provincial securities acts. Firms must apply to the exchange and receive approval from the exchange before initiating a repurchase program. Once authorized, programs must be completed within one year. The normal course issuer bid may commence on the date that is two trading days after the latest of either the date of acceptance of the issuer’s notice of intention or the date of the press announcement. The issuer firms are required to disclose the number of shares repurchased and this information is published monthly by TSX.

In Canada, an issuer may at anytime file for permission to make a Normal Course Issuer Bid (NCIB). An “issuer bid” is defined as an offer to acquire TSX listed voting or equity shares made by the issuer firm. A “normal course issuer bid” is an issuer bid made at the market price, allowing the issuer to purchase in the open market 5% of the issued and outstanding share capital of the issuer or up to 10% of the public float of the issuer. The public float is equal to the total number of shares outstanding less the insider

shareholdings. Firms are restricted from repurchasing shares on an up-tick, which means the purchases cannot be made at a premium to the market but are subjected to the orderly market making rules of a market support account.

On April 27, 2007, The Toronto Stock Exchange (the "TSX") issued a Notice of Approval for Amendments to the Normal Course Issuer Bid Rules in the TSX Company Manual (the "Amendments"). The Amendments will come into effect on June 1, 2007. The Amendments affect how a normal course issuer bid ("NCIB") is carried out on TSX. The Amendments is summarized as follows.

The TSX has replaced the current 2%-in-30-days restriction with a daily buy-back limit for all issuers (other than investment funds). Under the Amendments, issuers will be permitted to repurchase up to 25% of the average daily trading volume ("ADTV") of the listed securities of the issuer on any trading day. ADTV is calculated based on the trading on the TSX of the listed securities during the six month period immediately preceding the date of acceptance of the NCIB by the TSX.

Issuers will continue to be restricted from purchasing more than 10% of an issuer's public float (as defined in the TSX Manual) or 5% of its issued and outstanding securities during any 12-month period.

The Amendments provide for a new exception to permit one "block purchase" per week. Specifically, issuers will be permitted to buy back one block of securities per week which exceeds the daily repurchase restrictions (described above). A "block" is defined in Section 628(a)(ii) of the Amendments as a quantity of securities that either (a) has a purchase price of \$200,000 or more, or (b) is at least 5,000 securities and has a purchase price of at least \$50,000, or (c) is at least 20 board lots of the security and total

150% or more of the ADTV for that security. In addition, and in contrast to the draft version of the Amendments originally published for comment in October 2005, NCIB purchases may be made on the same day of a block purchase, up to the time of the block purchase. Once the block purchase exemption has been relied upon in a given day, no further NCIB purchases may be made for the remainder of that trading day. It should also be noted that issuers are not permitted to purchase blocks under the foregoing exemption from insiders (the definition of which remains the same).

The TSX Manual currently requires that purchases made under an NCIB be made at a price, which is not higher than the last "independent trade" of a board lot of the listed securities. The definition of what does not constitute an "independent trade" under Section 629 has been revised to make clear that any trades directly or indirectly by a broker making purchases for the bid which are made in order to facilitate a subsequent block purchase by the issuer at a certain price will not be an "independent trade".

The TSX Manual currently prohibits any purchases of securities by an issuer pursuant to an NCIB while the issuer possesses any material undisclosed information. The Amendments clarify that this restriction will not apply to NCIBs established by the listed issuer in accordance with applicable securities laws, particularly Section 175 of Regulation 1015 of the Securities Act (Ontario) (the "OSA"), which basically exempts purchases and sales of securities from the general prohibition from trading with knowledge of an undisclosed material fact or material change (Section 76(1), OSA) and from liability in respect of such trades (Section 134, OSA), where the issuer proves that the purchase or sale was made pursuant to an automatic share purchase plan. The Amendments will permit an issuer purchasing its own shares under an automatic

purchase plan conducted under its NCIB to do so even if it possesses material undisclosed information at the time of actual purchase, provided that at the time the decision to purchase was made (i.e., when the issuer gave instructions to the broker), the issuer was not in possession of material undisclosed information.

WHY FIRMS REPURCHASE

Dittmar (2000) investigates the motives for stock repurchases using hypotheses of excess capital, undervaluation, optimal leverage ratio and management incentive. She finds that firms would take advantage of potential undervaluation and distribute excess capital by stock repurchase throughout the sample period. During certain periods, firms would alter their leverage ratio to achieve the target leverage ratio.

Jensen (1986) argues that free cash flow is cash flow in excess of that required to fund all positive net present value projects. Conflicts of interest between shareholders and managers over payout policies are severe when firms generate substantial free cash flow. Managers with substantial free cash flow can repurchase stock and thereby pay out current cash flow that would otherwise be invested in low-return projects or wasted.

Fenn and Liang (1998) finds evidence that because the value of management stock options is negatively related to expected future dividend payments, management can increase the value of its stock options by substituting share repurchases for dividend growth. For dividend-paying firms, share repurchases are positively related and dividend increases are negatively related to a proxy for management stock options, whereas for non-dividend-paying firms, the relationship between repurchases and options is weak and statistically insignificant.

SECTION 4: DATA AND METHODOLOGY

DATA

Our total sample consisted of 139 Canadian firms that were listed on the Toronto Stock Exchange and that made stock repurchase announcements between January 2005 and June 2007. We collected information regarding these firms' repurchase announcements from Canada NewsWire Ltd. (CNW). CNW published 481 NCIB announcements over the January 2005 to June 2007 sample period. Out of these announcements, we selected 139 samples by excluding the following announcements in order to focus on the signalling effect of NCIB announcements on the return of common stocks only:

- NCIB announcements of repurchasing preferred stocks
- NCIB announcements made by mutual funds companies
- NCIB announcements of adjustments on existing NCIB announcements
- NCIB announcements with quarterly performance
- NCIB announcements mixed with common shares and preferred shares
- NCIB announcements combined with debt redemption.

Table 2 summarizes the NCIB sample statistics. NCIBs announced by the commodity group consist of those made by the constituent companies in the energy and materials sectors of the TSX. Non-commodity group encompass all other sample companies not in the energy and materials sectors. Both commodity and non-commodity

groups show trends of declining in terms of the amount of NCIB announced during the sample period under study. Especially for the commodity group, while there was a 14% drop in the amount of NCIB announcement from 2005 to 2006, the decline in the first six months of 2007 is dramatic. While the NCIB amounts for non-commodity groups was down by almost 42% in 2006 from the 2005 level, the amount went back up substantially during the first half of 2007. The amount for the six months in 2007 is almost equivalent to the total amount of NCIB announcements made in the whole 2006 year. On an overall basis, the commodity group represents 40.9% and non-commodity group 59.1% of the total NCIB announcements for all the sample companies during the event period. In terms of the frequency of NCIB announcement, we noticed declining trends as well, where the number has dropped by approximately 20% over the three year period (assume the number for 2007 doubles the numbers for the first six month). However, the average amount of NCIB announcement over the three year period appear to be fairly steady, with a slight decline in 2006 and then went back up during the first half of 2007.

It is interesting to note the declining pattern for the commodity group in terms of the stock repurchase announcement during the sample period. Initially buoyed by low interest rate and easy credit, the market reacted favourably to what appeared to be the beginning of a long lasting commodity cycle, which NCIBs signalled anticipated windfall profits to come to Canadian producers of energy and material sectors. These signals drew attention to the potential for profits for existing operations in the energy and material sectors as their underlying commodities were becoming more in demand resulting in higher prices and therefore windfall profits. As a result, initially firms experiencing such higher earnings went into their markets with strong NCIB activities. The period we have

chosen is the most volatile in the past few years and therefore as the number of NCIBs decreased over the last 30 months, one would expect the NCIBs to have a lesser effect on the market of the issuer than our data indicated. Other than financial markets (the big six), all other sectors of the market have suffered due to the drop of the U.S. dollar in relation to the Canadian dollar and as a result and as indicated by Figure 2, the rise in the Canadian dollar and the fall of the U.S. dollar has all but wiped out any chance of windfall profits for energy or material and manufacturing sector of the TSX. The result is that commodities sold in U.S. dollars and costs incurred in Canadian dollars have created a negative impact of approximately 35 to 50% increase in direct costs to Canadian producers and a shortage of skilled, semiskilled and labours has further driven Canadian costs upwards. These factors along should have kept the market from advancing but the effect is only being felt now, 2.5 to 3 years after the fact. As this effect is now being recognized, the number of NCIBs has dropped significantly yet our data still shows a positive effect overall on the issuers' market just prior to and directly afterwards.

Table 3 provides the list of NCIB samples used in our study. Event date is collected for each individual sample companies as well as the announced NCIB shares as a percentage of the total outstanding shares of the issuer companies. The average percentage of NCIB shares to outstanding shares is 5.7%, with the highest percentage of 10% and lowest 0.337%. TSX by laws restrict the amount that the issuer can purchase in the open market to 5% of the issued and outstanding share capital of the issuer or up to 10% of the public float of the issuer. Among all the sample companies, over 50% announced a repurchase of 5% of the total outstanding shares. Only 14% made an announcement of less than 5% of the total outstanding shares.

We adopted the market model to determine the effect of stock repurchase announcement on the issuer firms' stock prices. Using this model, abnormal return is calculated as the difference between the individual stock's return at a specific event date and the corresponding market return. More explanation of this model is provided in the next section. For the purpose of calculating the stock return and market return, we collected historical security price for each of the 139 sample firms and the TSX index from the Yahoo Finance website. Our event period was set as 10 days prior to and 10 days after the stock repurchase announcement date (i.e., 21-day window), hence historical stock prices for the sample firms and TSX index for the 22 days were collected. The reason for collecting one more day's data is to calculate stock returns which involving one day prior to the earliest date of the event window. From these historical prices, we calculated the stock returns for each of the sample firms for the 21-day event window as well as the market return for the TSX index.

Table 4 provides summary of the financial data used in our cross-sectional analysis. For purpose of the cross-sectional analysis, we determined three factors that can potentially explain the variation in abnormal returns. The three factors are book value to market value (BV/MV), retained earnings to book value (RE/BV) and percentage of NCIB shares to total outstanding shares. Therefore, we collected historical financial data, including book value, retained earnings and total number of shares outstanding, for each of the 139 sample firms for the past three fiscal years from FPinfomart and Reuters. Where these numbers are not provided in these two databases, we retrieved the annual audited financial statements from The System for Electronic Document Analysis and Retrieval (SEDAR). In table 4, we listed each sample firms' relevant fiscal year-ends

based on the date of the firms' repurchase announcement. For example, if a firm announced stock repurchase during 2006, we listed its financial data for both 2006 and 2005 fiscal year end. Average of the two years' data was then used to perform the cross-sectional analysis. BV/MV is calculated by dividing book value of the firm by its market capitalization, which is obtained using the firm's total number of outstanding shares at year-end times its stock price at the year-end. RE/BV is retained earnings over book value. NCIB percentage is obtained directly from CNW where firms' stock repurchase announcements are published.

Where the issuer firms' annual financial statements were expressed in US\$, average exchange rate for the year was used to convert the numbers to CAD. Average exchange rate was obtained from Bank of Canada website.

Year	2006	2005	2004
USD/CAD	1.1340936	1.2116324	1.30152024

MODEL

We adopted market adjusted return model to estimate abnormal return of individual NCIB stock. Under this model, market return is considered as the normal return at specific date of the event period, and abnormal return is calculated as the difference in returns between NCIB stock return and market return at the specific date. Therefore, abnormal return for stock j at time t can be expressed as follows.

$$A_{jt} = R_{jt} - R_{mt}$$

Where R_{jt} is actual return for stock j at time t and R_{mt} is market return at time t .

There are previous studies that have adopted the CAPM model where β was estimated from historical stock returns and is used to arrive at the estimated return for the specific stocks under analysis. While CAPM has been widely used in the studies, we are of the opinion that β changes over time. Because our study has a short-term focus and consequently using an β estimate derived from historical stock returns, (which tend to be long term) may not give us the correct estimate of risk for each individual stocks. Hence, the estimated returns for the stock may not be meaningful for our study. Instead, we used a simpler approach by defining abnormal return as the difference between the specific stock return and the actual market return and used it to assess the effect of stock repurchase announcement.

Moreover, we used average abnormal return of individual NCIB stock return at certain date of the event period to detect statistical significance. We used t-statistics to detect significance from the following equation.

$$(t-AR)_t = AAR_t / \left[S_t / \sqrt{N_t} \right]$$

where AAR_t refers to average abnormal return at time t and is calculated as

$(1/N_t) \sum (AR_{it})$; S_t indicates standard deviation at time t; N_t represents the number of observations at time t.

Our model is estimated over a 21-day period between day -10 and day +10. A cumulative excess return is calculated by cumulating the daily excess returns.

Adopting Fama (1993) three factor model, we used cross-sectional regression model to determine the factors that can potentially explain the variation in issuer firms' abnormal returns.

Factor 1: Book Value to Market Value

The book value-to-market value (BV/MV) factor has been well recognized as an indicator of the level of undervaluation of NCIB firms in the market. Book value is defined as the firm's total assets minus total liabilities and represents the value of the firm attributable to the firms' shareholders. If the firm's book value is significant higher than its market value, the firm is undervalued in a sense that the market has not recognized the full value of the firm as reflected in the firm's stock prices.

As surveyed in Section II of this paper under Literature Review, several previous studies has identified undervaluation as the reason of why firms repurchase. Comment and Jarrell (1991) conclude that firms tend to make the repurchase announcement following a decline in share price, when their stock is more likely to be undervalued. Loomis (1985) reports that repurchase performed well for shareholders only in cases where the stock was initially undervalued. Ikenberry, Lakonishok and Vermaelen (2000) observed stronger performance for Canadian value stocks that announced stock repurchases than that for the growth stocks. Grullon and Michaely (2004) found negative relationship between issuer firms' announcement returns and the firms' market-to-book ratio. Because market-to-book ratio is the reverse of BV/MV, the conclusion in Grullon and Michaely (2004) agrees with the rest of the papers illustrated here.

Since many previous studies have identified BV/MV as a significant factor in explaining abnormal return, we adopted this factor in our study to see if it continues to have significant explanatory power with regard to the variations in issuer firms' stock returns. If high BV/MV ratio indicates a level of undervaluation for the issuer firm, we expect to see a positive relationship between the issuer firms' abnormal returns and the BV/MV ratio.

Factor 2: NCIB Shares to Total Outstanding Shares

The NCIB shares to outstanding shares factor indicates the level of floating shares for the firms, and thus if issuer firms have low level of floating supply, NCIB shares as a percentage of total outstanding shares will be higher (all else being equal), and as such it is expected to have a positive effect on abnormal returns. Comment and Jarrell (1991) and Ikenberry et al. (1995) reported that, in the U.S. markets, higher proportions of target shares were associated with larger abnormal returns in response to repurchase announcements. Hatakeda and Isagawa (2004) identified positive relationship between the proportions of shares sought according to the repurchase announcement. McNally (1999) observes that returns of the issuer firms are positively related to the quantity of shares targeted. Similar results were found in Grullon and Michaely (2004). In our study, we will examine if the positive relationship between NCIB shares to total outstanding shares and abnormal returns still hold during our sample period.

Factor 3: Retained Earnings to Book Value

We adopted a third factor, retained earning to book value (RE/BV), which indicates if the company has accumulated capacity to execute the stock repurchase

program. RE/BV, in our opinion, is a good proxy for the sustained profitability of the firm. Retained earnings represent the accumulated earnings of the firm that are available for distribution to the shareholders or for reinvesting inside the firm. Retained earnings are shown as a component of the book value on the firms' financial statements. High RE/BV therefore infers that a higher portion of the firm's value is derived from its earning power. If the firm has high RE/BV, then it is expected that the signalling effect will positively affect the abnormal returns of the firm. Our one factor regression analysis reveals that RE/BV has the best explanatory power with regard to the abnormal returns.

In the cross-sectional model, abnormal return (AR) at event day (D-day) is defined as dependent variable, and the three independent or explanatory variables are identified which include BV/MV(Book value to Market value), RE/BV (Retained earning to Book value), and NCIB (percentage of NCIB shares to outstanding shares). Regression equation is described as follows:

$$AR_j = \beta_0 + \beta_1(BV / MV)_j + \beta_2(RE / BV)_j + \beta_3(NCIB)_j + \epsilon_j$$

RESULTS

Table 5 presents the average daily excess returns and cumulative returns over the event period for the whole sample. D represents the event date and is set as day 0. Hence, D+1 refers to the first day following the event date and D-1 refers to the day prior to the event date. The period between D-10 and D+ 10 therefore represent our event period. The abnormal return (AR) represents the average of the difference in returns for all sample companies' stocks and the corresponding market for each day of the 21-day event window. The average abnormal return during the event window is 0.07%, with the

highest 0.76% on the event date (0.75% on D+1 day) and lowest -0.33% on D-8 day. Cumulative abnormal return is the cumulative total of the abnormal return. Standard deviation is derived from the average abnormal returns for each event day with an average of 2.5% over the event window. It is noticeable that on the event date (D) and D+1 day, the volatility of 3.23% and 3.37% respectively which is much higher than the rest of the days. It can be said that the event date and D+1 day is characterized by significant positive abnormal returns and higher volatility compared with the other days during the event window. The last column of the table presents the t statistics for the abnormal returns. At a significance level of 1%, the t value for both D and D+1 day is significantly higher than the critical value.

Figure 1 plots the abnormal return and cumulative average excess return in the event window centred on the announcement date. On average, there is a significant increase in price following the announcement of stock repurchase. The average abnormal return over the concurrent market return from the close of trading on D-1 day to the close of trading on D+1 is 0.75%, where the announcement is on event date D. this is consistent with Ikenberry, Lakonishok and Vermaelen (2000) , who find average abnormal returns of 0.93% over the announcement month for Canadian stock repurchases. U.S. studies document average returns of 2.3% around open market repurchase announcements. We also find an abnormal negative return of -0.33% on D-8, 8 days preceding the announcement and a cumulative abnormal return of -0.72% 7 days preceding the announcement. Although both are not significant at the 1% significance level. Comment and Jarrell (1991) found significant price declines prior to the U.S. open market repurchase announcements. In general, Figure 1 reveals that the average stock

return of the total sample decreased prior to the announcements, and went up substantially in response to the announcements. The magnitude of the decline in abnormal returns prior to the announcement and the subsequent run up on the event date and one day following is less than that of the cumulative abnormal returns. In the post-announcement period (from day +2 to day +10), the abnormal return decreased substantially while cumulative abnormal return did not drop significantly and remain at a fairly steady level.

Table 6 summarizes the results from simple, bivariate and multiple regressions analysis.

Panel A shows the results of simple regression analysis. Looking at each factor individually and regress the abnormal returns against each factor separately, RE/BV appears to be the most significant factor in explaining abnormal returns due to its higher R^2 and t value. With a positive slope, both the intercept and slope for the RE/BV factor are significant at the 5% and 1% significance level respectively. As RE/BV implies the issuer firms' capability to generate income, firms with higher RE/BV that make stock repurchase announcement should be perceived by the market as a positive strategic activity. Hence, one would expect a positive relationship between the RE/BV ratio and the abnormal returns from the repurchase announcement. Our results confirms this hypothesis where the positive slope and significant t value demonstrates that RE/BV contribute significantly to the variation in abnormal returns of the issuer firms. R^2 of 5.08% for this factor implies that RE/BV alone explains 5.08% of the variation in abnormal returns.

Compared with RE/BV, BV/MV has a lesser explanatory power in terms of the changes in abnormal returns. Again, we noted positive slope, which agrees with the previous studies that found undervaluation as one of the most significant factors influencing firms' repurchase decision. When higher BV/MV firms make repurchase announcement, it is expected that market will react favourably due to the fact that the announcement send the signal to the market, which generate awareness from the market participant that the issuer firms are undervalued. The positive slope confirms this positive reaction. The BV/MV alone explains 4.07% of the variation in abnormal returns.

The NCIB shares factor does not appear to a significant factor in explaining the changes in abnormal returns. As found in previous studies, we noted positive slope. The coefficient is much higher than the other two factors, although not significant. It alone helps explain less than 1% of the variation in abnormal returns. Although the coefficient of NCIB is not significant, abnormal return is heavily influenced by the level of NCIB shares to outstanding shares. With a coefficient of 0.1119, the abnormal returns are more sensitive to the level of NCIB shares announced.

Panel B provides summary of bivariate regression analysis, where taking two factors at a time, regression was performed to determine which two factors together have better explanatory power with regard to abnormal returns. Our results show that BV/MV and RE/BV together have superior explanatory powers. Both are determined as having a positive slope and are significant at the 1% significance level. Firms with higher BV/MV and RE/BV can be considered as those with great income generating power but undervalued relative to its stock prices. When these firms make repurchase announcement, market should react positively and therefore push its stock price to a new

high level. It is noticeable that the two factors together explain almost 10% of the variation in abnormal returns, which is equivalent to the total of the R^2 obtained from each factor individually.

Taking BV/MV and NCIB shares factors together, at a significance level of 5%, the BV/MV factor is identified as significant whereas NCIB factor is not. This is consistent with the results from our simple regression analysis. The results here show that adding NCIB factor to the BV/MV does not help much in explain the variation of the abnormal returns. We also noted the significantly lower coefficient for NCIB share factor compared with that in the simple regression model. Replacing BV/MV with RE/BV, the RE/BV and NCIB factors together appear to have greater explanatory power, although not as significant as the pair of BV/MV and RE/BV. One possible explanation for this is that BV/MV and RE/BV can be considered as firms' signalling to the market using the stock repurchase program, whereas the NCIB shares announced is merely information. Hence, the two factors with signalling power appear to have synergy and thus greater effect on the issuer firms' abnormal returns.

Panel C takes all three factors together. The results show that the model explains almost 11% of the variation in abnormal returns, which is higher than the results obtained from both the simple and bivariate regression analysis. In other words, the three-factor model appears to be superior to the simple and bivariate regression models. In this model, BV/MV and RE/BV factors have significant coefficient whereas NCIB shares factor has higher coefficient, although not statistically significant.

SECTION 5: CONCLUSION

Stock repurchase has been a topic of interest to many researchers. The extant literature reports a positive price reaction for firms announcing an open-market share repurchase program. This study examines the effect of Canadian open stock repurchase announcement on the return of issuer firms' stocks and finds significant positive return reaction to the repurchase announcement. Further more, this paper attempts to identify factors that may potentially contribute to the positive effect of stock repurchase announcement and observes significant explanatory power from BV/MV and RE/BV.

TABLES AND FIGURES

Table 1: Summary of Empirical Findings of Share Repurchase Announcement Abnormal Returns

Study	Country	Sample Period	Event Window	CAR	n
<u>Short-term Abnormal Return</u>					
Ikenberry et al. (2000)	Canada	1989-1997	Month of announcement	0.93%	1060
Li and McNally (2005)	Canada	1987-2000	-1 to +2 days	0.73%	901
McNally (2002)	Canada	1988-2000	-1 to +4 days	1.30%	396
Vermaelen (1981)	U.S.	1970-1978	-1 to +1 days	3.62%	243
Comment and Jarrell (1991)	U.S.	1984-1989	-1 to +1 days	2.30%	1037
Ikenberry et al (1995)	U.S.	1980-1990	-2 to +2 days	3.54%	1239
Chan et al (2004)	U.S.	1980-1996	-2 to +2 days	2.46%	5508
Grullon and Michaely (2004)	U.S.	1980-1997	-1 to +1 days	2.71%	4443
<u>Long-term Abnormal Return</u>					
Ikenberry et al. (2000)	Canada	1989-1997	2 year	14.88%	1060
McNally (2002)	Canada	1988-2000	1 year	9.73%	396
Ikenberry et al. (1995)	U.S.	1980-1990	3 year	8.69%	1239
Chan et al. (2004)	U.S.	1980-1996	1 year	6.68%	5508
Chan et al. (2004)	U.S.	1980-1996	2 year	10.97%	5382

This table is reproduced from Schmidt (2006) and provides a summary of the results from selected studies for the abnormal return on the announcement of a share repurchase program. Results are provided for both short and long-term event horizons.

Table 2: Summary statistics of NCIB Firms

NCIB (\$'000)	2005	2006	2007**	Total
Commodity*	7,815,169	6,715,732	110,584	14,641,486
Non-Commodity	9,990,092	5,849,083	5,348,451	21,187,626
Total	17,805,262	12,564,815	5,459,035	35,829,112

* Energy and Material sectors

** January to June 2007

Announcement Frequency

	2005	2006	2007*	Total
Number of NCIB announcement	65	53	21	139
Average \$ NCIB ('000)	273,927	237,072	259,954	257,763

* January to June 2007

Table 3: Summary of NCIB Samples

Event Date	Company	% NCIB of Outstanding	Event Date	Company	% NCIB of Outstanding	Event Date	Company	% NCIB of Outstanding
28-Jun-07	Mainstreet Equity Corp.	6.5	10-Aug-06	PLM Group Ltd.	5	9-Sep-05	Gentry Resources Ltd.	8.95
27-Jun-07	Enerchem International Inc.	5	2-Aug-06	Accord Financial Corp.	5	1-Sep-05	BMO Financial Group	5
25-Jun-07	Renticash Inc.	8.9	26-Jul-06	Clarke Inc.	5	26-Aug-05	Leon's Furniture Limited	4.99
4-Jun-07	QLT Inc.	10	14-Jul-06	Aberdeen Asia-Pacific Income Investment Company	10	24-Aug-05	ZCL Composites Inc.	5
29-May-07	FirstService Corporation	5	13-Jul-06	GEOCAN Energy Inc.	5	19-Aug-05	Havoy Communications Group Inc.	10
29-May-07	Global Resource Split Corp.	5	6-Jul-06	MDS Inc.	7.6	18-Aug-05	Xantrex Technology Inc.	7.38
24-May-07	Burnsand Inc.	10	23-Jun-06	Pareto Corporation	6.9	17-Aug-05	Genesis Land Development Corp.	5
8-May-07	Cossette Communication Group Inc.	5	21-Jun-06	Imperial Oil Limited	5	17-Aug-05	Samuel Manu-Tech Inc.	5
2-May-07	MIDDLEFIELD BANCORP LIMITED	5	20-Jun-06	Royal Bank of Canada	0.5	3-Aug-05	Accord Financial Corp.	5
27-Apr-07	CIBC	3	12-Jun-06	Boralex Inc.	5	26-Jul-05	Clarke Inc.	5
27-Mar-07	Tundra Semiconductor Corporation	10	29-May-06	Global Resource Split Corp.	10	19-Jul-05	Oppenheimer Holdings Inc.	5
26-Mar-07	Canadian Pacific Railway Limited	3.2	29-May-06	SNC-Lavalin Group Inc.	7.2	13-Jul-05	Aberdeen Asia-Pacific Income Investment Company	10
19-Mar-07	Compton Petroleum Corporation	4.7	18-May-06	Xceed Mortgage Corporation	5	13-Jul-05	Pinecrest Capital Ltd.	5
15-Mar-07	Addenda Capital Inc.	10	16-May-06	High Liner Foods Incorporated	5	23-Jun-05	PLM Group Ltd.	5
9-Mar-07	Cascades Inc.	5	8-May-06	Sobeys Inc.	3.1	21-Jun-05	Imperial Oil Limited	5
19-Feb-07	Pacific Insight Electronics Corp	5	2-May-06	MIDDLEFIELD BANCORP LIMITED	5	20-Jun-05	Petro-Canada	5
15-Feb-07	Tucows Inc.	10	28-Apr-06	Western Financial Group Inc.	5	15-Jun-05	Real Resources Inc.	5
6-Feb-07	BCE Inc.	5	13-Apr-06	Calfrac Well Services Ltd.	10	2-Jun-05	Stirling Centrecorp Inc.	5
25-Jan-07	Mavrix Fund Management Inc.	10	30-Mar-06	Belzberg Technologies Inc.	5	31-May-05	FirstService Corporation	5
10-Jan-07	Sun Life Financial Inc.	5	30-Mar-06	Endeavour Mining Capital Corp.	10	31-May-05	Global Resource Split Corp.	10
3-Jan-07	Bank of Nova Scotia	2	14-Mar-06	Compton Petroleum Corporation	4.7	27-May-05	AKITA Drilling Ltd.	5
22-Dec-06	Canaccord Capital Inc.	5	10-Mar-06	Cascades Inc.	5	27-May-05	Royal Bank of Canada	1.5
15-Dec-06	TELUS Corporation	6.7	1-Mar-06	Mediagrit Interactive Technologies Inc.	6.8	26-May-05	SNC-Lavalin Group Inc.	7.8
13-Dec-06	Manitoba Telecom Services Inc.	10	30-Jan-06	Consolidated HCI Holdings Corporation	4.9	20-May-05	BioMS Medical Corp.	1.9
4-Dec-06	FPL Limited	5	17-Jan-06	Dycoset Lighting Inc.	6.8	19-May-05	Boralex Inc.	5
29-Nov-06	Great-West Lifeco Inc.	0.67	9-Jan-06	Cossette Communication Group Inc.	5	16-May-05	Canadian Utilities Limited	5
29-Nov-06	WGI Heavy Minerals, Inc.	10	4-Jan-06	Bank of Nova Scotia	5	13-May-05	Mavrix Fund Management Inc.	10
28-Nov-06	Marsulex Inc.	4.6	29-Dec-05	Pacific Insight Electronics Corp	5	3-May-05	Exco Technologies Limited	5
24-Nov-06	Pulse Data Inc.	5	19-Dec-05	Burnsand Inc.	7.95	3-May-05	High Liner Foods Incorporated	5
10-Nov-06	Amerigo Resources Ltd.	2.8	16-Dec-05	TELUS Corporation	6.5	2-May-05	MIDDLEFIELD BANCORP LIMITED	5
7-Nov-06	Kingsway Financial Services Inc.	5	2-Dec-05	FPL Limited	5	25-Apr-05	Pareto Corporation	4.1
2-Nov-06	EnCana Corporation	10	24-Nov-05	Great-West Lifeco Inc.	0.337	18-Apr-05	GEOCAN Energy Inc.	4.6
30-Oct-06	Q9 Networks Inc.	5	23-Nov-05	Reitmans (Canada) Limited	5	14-Apr-05	Gemini Energy Corp.	5
25-Oct-06	Briek Brewing Co. Limited	5	18-Nov-05	Cyberplex Inc.	8.1	5-Apr-05	Sobeys Inc.	3.1
23-Oct-06	Coalcorp Mining Inc.	8.8	10-Nov-05	Amerigo Resources Ltd.	9.1	29-Mar-05	Loblaw Companies Limited	5
19-Oct-06	The Toronto-Dominion Bank	0.7	10-Nov-05	COM DEV International Ltd.	8.42	22-Mar-05	Belzberg Technologies Inc.	5
10-Oct-06	MacDonald, Detwiler and Associates Ltd.	4.9	3-Nov-05	Kingsway Financial Services Inc.	5	15-Mar-05	Compton Petroleum Corporation	4.96
27-Sep-06	Gentry Resources Ltd.	8.8	2-Nov-05	WGI Heavy Minerals, Inc.	10	9-Mar-05	Cascades Inc.	5
26-Sep-06	Genesis Land Development Corp.	5	28-Oct-05	Norbord Inc.	6.25	2-Mar-05	Sears Canada Inc.	5
20-Sep-06	Morguard Corporation	5.4	17-Oct-05	Tembec Inc.	5	25-Feb-05	Industrial Alliance Insurance and Financial Services	4.8
18-Sep-06	Tri-White Corporation	5	29-Sep-05	Q9 Networks Inc.	5	24-Feb-05	The Toronto-Dominion Bank	2.1
15-Sep-06	Revenue Properties Company Limited	5	20-Sep-05	Consolidated Mercantile Incorporated	5	17-Feb-05	Paladin Labs Inc.	4.2
14-Sep-06	Melcor Developments Ltd.	5	20-Sep-05	Revenue Properties Company Limited	5	1-Feb-05	CGI Group Inc.	6.8
23-Aug-06	Jaguar Mining Inc.	5	19-Sep-05	Morguard Corporation	5.5	27-Jan-05	Consolidated HCI Holdings Corporation	4.7
17-Aug-06	Xantrex Technology Inc.	10	16-Sep-05	Tri-White Corporation	5	4-Jan-05	Bank of Nova Scotia	5
15-Aug-06	Maple Leaf Foods Inc.	5	14-Sep-05	Melcor Developments Ltd.	5			

Table 5: Abnormal Return over Event Period

Date	AR	CAR	Standard Deviation	t-Statistics
D-10	-0.07%	-0.07%	2.34%	-0.3426
D-9	-0.07%	-0.14%	2.61%	-0.3185
D-8	-0.33%	-0.47%	2.98%	-1.3152
D-7	-0.25%	-0.72%	2.23%	-1.3189
D-6	0.15%	-0.57%	2.87%	0.6088
D-5	0.06%	-0.52%	2.27%	0.3068
D-4	0.16%	-0.36%	2.54%	0.7365
D-3	0.00%	-0.36%	2.07%	-0.011
D-2	-0.12%	-0.48%	2.19%	-0.6447
D-1	0.10%	-0.38%	1.93%	0.578
D*	0.76%	0.37%	3.23%	2.7544**
D+1	0.75%	1.12%	3.37%	2.5950**
D+2	-0.03%	1.09%	2.75%	-0.132
D+3	0.05%	1.14%	2.46%	0.2238
D+4	-0.12%	1.02%	2.62%	-0.5273
D+5	0.10%	1.12%	2.36%	0.4839
D+6	0.27%	1.39%	2.39%	1.3449
D+7	0.12%	1.51%	2.18%	0.6571
D+8	-0.24%	1.27%	2.33%	-1.1923
D+9	0.01%	1.28%	2.32%	0.0351
D+10	0.09%	1.38%	2.37%	0.4657

* NCIB announcement day or event day

** Statistically significant at significance level of 1%

Table 6: Results of Cross-Sectional Regression Model

Panel A: Simple Regression Model

	Intercept	Slope	R-squared
AR-BV/MV Regression	0.001701 (0.484576)	0.006940 (2.400912**)	0.0407
AR-RE/BV Regression	0.006603 (2.470232**)	0.004748 (2.698988***)	0.0508
AR-NCIB Regression	0.000762 (0.103363)	0.111921 (0.932307)	0.0064

** Significant at the level of 5%

*** Significant at the level of 1%

Abnormal return (AR) is regressed against each of the three factors – book value to market value (BV/MV), retained earnings to market value (RE/BV) and NCIB shares to total shares outstanding. Among the three factors, both BV/MV and RE/BV appear to have significant explanatory power with regard to the abnormal return. Compared to the other two factors, RE/BV has higher R^2 and t-statistics and therefore is identified as be the most appropriate factor to explain the variation in abnormal return (AR).

Panel B: Bivariate Regression Model

	Intercept	BV/MV	RE/MV	R^2
AR-BV/MV & RE/BV	0.000671 (0.195480)	0.007513 (2.664284***)	0.005065 (2.936350***)	0.0983

*** Significant at the level of 1%

	Intercept	BV/MV	NCIB	R^2
AR-BV/MV & NCIB	-0.001251 (-0.170928)	0.006658 (2.246679**)	0.055634 (0.460074)	0.0422

** Significant at the level of 5%

	Intercept	RE/MV	NCIB	R^2
AR-RE/BV & NCIB	-0.005504 (-0.740354)	0.005583 (3.083675***)	0.210530 (1.743239*)	0.0717

* Significant at the level of 10%

*** Significant at the level of 1%

The results of bivariate regression shows that with a R^2 higher than the other two pairs, BV/MV and RE/BV together best explains the abnormal return.

Panel C: Multiple Regression Model

Intercept	BV/MV	RE/BV	NCIB	R^2
-0.007630 (-1.035921)	0.006795 (2.368433**)	0.005647 (3.171278***)	0.154207 (1.273206)	0.1090

** Significant at the level of 5%

*** Significant at the level of 1%

The Multiple regression model has the highest R^2 value relative to the simple and bivariate regression model, which indicates that the multiple regression model better explains the variation in the abnormal return as a result of NCIB announcement.

Figure 1: AR and CAR over Event Period

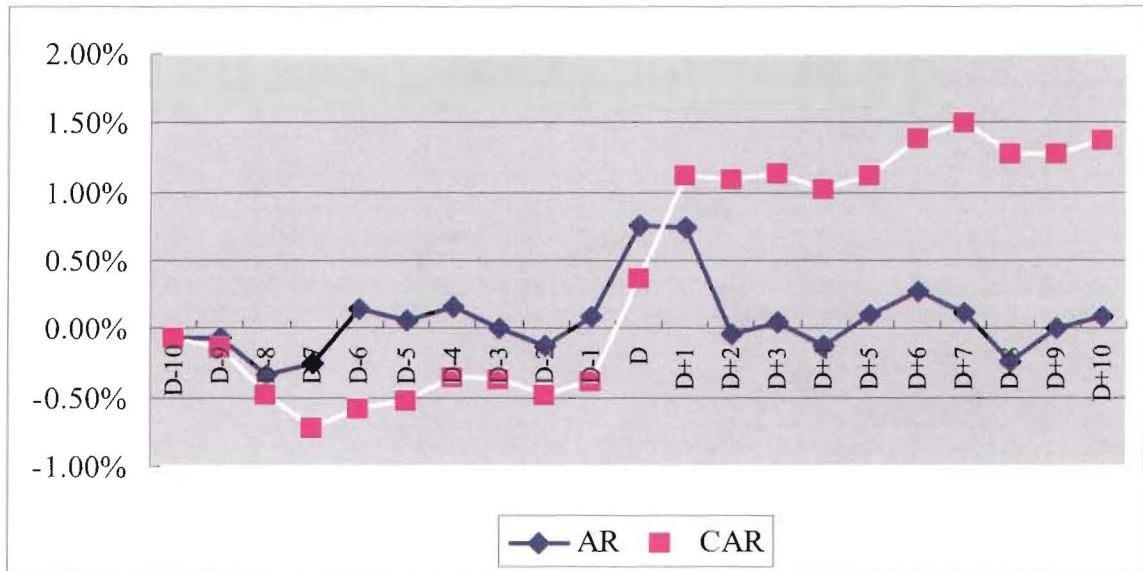
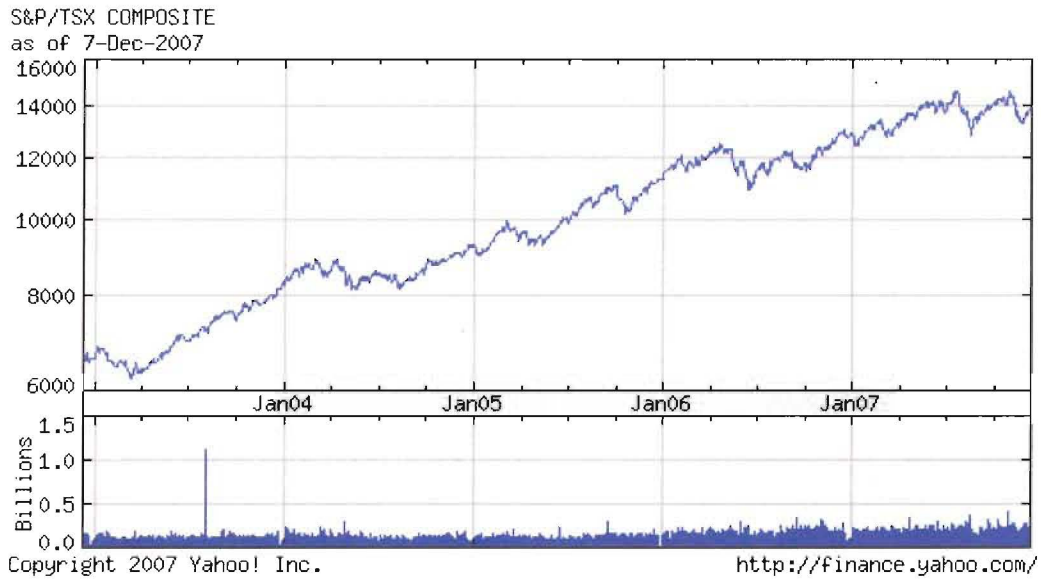


Figure 2: 5-Year Chart for TSX and Canadian Dollar



Canadian Dollar versus U.S. Dollar



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