NBER WORKING PAPER SERIES

STOCK REPURCHASES IN CANADA: PERFORMANCE AND STRATEGIC TRADING

David Ikenberry
Josef Lakonishok
Theo Vermaelen

Working Paper 7325
http://www.nber.org/papers/w7325

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 1999

We appreciate the research assistance of Pricha Sethapakdi. Timothy Baikie, Special Counsel Market Regulation for the Toronto Stock Exchange, was helpful in providing data and counsel. We also thank Dino Mastroianni and Vinod Chandrashekaran from BARRA for their help and comments. We appreciate the comments of Louis Chan, Ken French, Ravi Jagannathan, Narasimhan Jegadeesh, Jason Karceski, Inmoo Lee, Raghu Rau, Cliff Stephens, René Stulz, Sheridan Titman and seminar participants at the University of Washington, University of Texas and Catholic University Leuven. The views expressed herein are those of the authors and not necessarily those of the National Bureau of Economic Research.

Stock Repurchases in Canada: Performance and Strategic Trading
David Ikenberry, Josef Lakonishok, and Theo Vermaelen
NBER Working Paper No. 7325
August 1999
JEL No. G14, G32

ABSTRACT

During the 1980s, U.S. firms that announced stock repurchase programs earned favorable long-run returns. Recently, concerns have been raised regarding the robustness of these findings. This comes at a time of explosive worldwide growth in the adoption of repurchase programs. This study provides out-of-sample evidence for 1,060 Canadian repurchase programs announced between 1989 and 1997. As in the U.S., the Canadian stock market seems to discount the information contained in repurchase announcements. Value stocks announcing repurchase programs have particularly favorable returns. Canadian law requires companies to report how many shares they repurchase on a monthly basis. We find that managers are sensitive to mispricing as completion rates are higher in cases where undervaluation may be a more important factor. Moreover, trades are linked to price movements; managers buy more shares when prices fall and reduce their buying when prices rise.

David Ikenberry
Rice University
Houston, Texas 77005

Josef Lakonishok
University of Illinois
1206 S. Sixth St.
Champaign, Illinois 61820
and NBER

Theo Vermaelen
INSEAD
77305 Fontainebleau Cedex
France

1. Introduction

In recent years, corporations have dramatically increased the amount of capital devoted to repurchasing their own shares. In the mid-1980s, repurchase program announcements in the U.S. amounted to roughly $25 billion per year. Between 1996 and 1998 however, more than 4,000 open market repurchase programs were announced which, if fully completed, amount to roughly $550 billion.[1] During the first quarter of 1999 alone, Securities Data Company reports nearly 350 program announcements totalling $40 billion. Interest in corporate repurchase programs is not limited to the U.S. as repurchase activity worldwide has grown in recent years. Countries such as Hong Kong and Japan recently implemented new regulations allowing companies for the first time to repurchase their shares. A recent Goldman Sachs study (March 1999) foresees stock repurchases becoming more common in Europe and discusses the potential impact on European equity values.

The literature is rich with motives as to why firms might repurchase their own stock. The list includes, for example, tax benefits, distributing excess cash and adjusting capital structure. Yet these reasons are not as popular with managers who often suggest when announcing buyback programs that current market prices are too low and hence their stock is an attractive investment (Dann (1983) and Wansley, Lane, and Sarkar (1989)). Several studies report evidence consistent with this managerial story of undervaluation. In a comprehensive examination of U.S. open market repurchase programs during the 1980s, Ikenberry, Lakonishok and Vermaelen (1995) find that the market's initial response to repurchase announcements is not complete. They report annualized abnormal performance of 2.9% over a four-year period following the announcement. For value stocks, where a stronger case can be made for

[1] For comparison, the NYSE reports that aggregate cash dividends paid by member firms over this period was approximately $490 billion.

undervaluation, the annual abnormal return was 6.4% over the same post-announcement period.[2]

Although previous studies have examined hundreds of repurchase program announcements, the history of this transaction is rather short, only becoming pervasive in the U.S. in the late 1980s. Moreover, international evidence regarding repurchases is limited as many countries have only recently allowed firms to repurchase stock. Thus, a degree of skepticism regarding the existing evidence on share repurchases is warranted. As Merton (1985) suggests, we are biased toward publishing "exciting" results. Indeed, recent papers have 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.[3] Studies on stock repurchases have been included in these critiques.

Given the recent growth in repurchase activity worldwide, fresh evidence on long-run performance of repurchasing firms is of interest. While many countries now allow repurchases, the only country outside the U.S. that has a reasonable sample at this point is Canada. Thus, we examine open market programs announced by firms trading on the Toronto Stock Exchange (TSE). Moreover, we utilize programs announced between 1989 and 1997, a time period that generally follows the sample period examined in earlier U.S. studies. Our sample is comprehensive and contains 1,060 program announcements authorizing $35 billion in repurchases. This analysis is supplemented with evidence of long-run stock performance following the issuance of shares. Specifically, we consider Canadian seasoned equity offerings and acquisitions that were at least partially financed with equity. A result consistent with repurchases would show a downward drift in stock performance after an announcement of an increase in shares outstanding.

---

[2] In an earlier paper on fixed-price tender offer repurchases, Lakonishok and Vermaelen (1990) also find evidence of positive abnormal returns lasting at least two years following the announcement.

[3] For example, Fama (1998) and Mitchell and Stafford (1997).

Canadian data is of particular interest, however, because firms must report each month the number of shares they actually repurchase. This information is summarized by the exchanges and published on a timely basis. Precise, periodic information on repurchase activity does not exist for U.S. firms. Moreover, U.S. reporting conventions even make it difficult to obtain good estimates of overall completion rates (Stephens and Weisbach (1998)). Our unique data allow us to accurately measure program completion rates and examine factors that affect these managerial decisions.

Access to monthly repurchase data allows us to study whether managers execute share repurchases strategically in response to market movements. Managers repurchase stock for a variety of reasons, many of which may not relate to mispricing. For example, to the extent that firms repurchase shares to avoid dilution in earnings from the exercise of options, or use repurchases as a tax efficient alternative to paying cash dividends, one would not expect to find a relation between price movements and the level of repurchase activity in a given month. Also, if managers view the market as efficient, we would not expect them to react to price movements. However, managers often mention undervaluation as an important motive for repurchasing shares. To the extent that they believe prices deviate from their intrinsic value, we expect to observe managers repurchasing shares more aggressively when prices are falling. Likewise, we expect the incentive to repurchase shares to diminish after a rise in prices. Data from Canada enable us to assess the extent to which managers trade strategically and thus should help us better understand what motivates repurchase activity.

We find that undervaluation appears to be just as important a consideration for repurchasing shares in Canada as earlier findings suggest for the U.S. Using the Fama-French (1993) three-factor model, Canadian firms repurchasing shares show abnormal performance of 0.59% per month over a three-year period following the announcement. In the year prior to the announcement, abnormal returns are negative, -0.35% per month. Such poor pre-announcement performance and subsequent out

performance are consistent with undervaluation being a motivating factor for stock repurchases. A stronger case for undervaluation as a motive for repurchasing shares can be made for value stocks. The results are consistent with this hypothesis. 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.

We also evaluate performance subsequent to an increase in shares where firms either issued seasoned equity or acquired other firms with stock. Here, the results are again consistent with the notion that mispricing is a factor in managerial decision making. Abnormal returns are high prior to SEOs or equity-financed acquisitions made by TSE firms, yet subsequent abnormal return performance is substantially negative.

The results suggest that managers trade strategically. Price changes seem to have a major impact on repurchase activity. Consistent with the undervaluation story, an increase in prices leads to a reduction in the number of shares repurchased, whereas a drop in stock prices leads to a larger fraction of shares repurchased. Completion rates are also higher for value stocks than for growth stocks. Moreover, firms that actively repurchased shares experience only modest returns while the program was in effect. Yet, these firms enjoy sizeable abnormal returns in subsequent years. Conversely, companies that did not buy any shares show strikingly large excess returns while the program is in effect, yet no evidence of positive abnormal returns in subsequent years. Overall, the results suggest that managers' repurchase decisions are sensitive to prevailing market prices, a result consistent with the undervaluation hypothesis.

The paper is organized as follows. Section 2 briefly describes the institutional setting surrounding repurchase programs in Canada and also describes how we formed our sample. Section 3 reviews the methodology used to evaluate long-run performance. Section 4 provides descriptive information regarding sample programs and documents the short-run market reaction to repurchase announcements. Section 5

presents evidence on subsequent long-run performance. Section 6 reports evidence on program repurchase completion rates and the extent to which managers execute repurchase programs strategically. Section 7 further examines the strategic nature of repurchase decisions by examining long-run performance conditional on various levels of repurchase activity. Section 8 provides results for the opposing case where managers issue equity either through SEOs or stock-financed acquisitions. Concluding remarks are provided in section 9.

2. Repurchases in Canada

a. Institutional aspects of repurchases in Canada

The regulatory environment affecting Canadian open market repurchase programs differs from that in the U.S. In Canada, these programs are referred to as "Normal Course Issuer Bids." The primary oversight mechanism for these programs is provided by the exchange where the company's stock trades. Unlike U.S. firms, Canadian firms must receive approval from the exchange before initiating a repurchase program. The application process to repurchase stock at the TSE is generally straightforward and is usually completed in a limited number of days. As in the U.S., these programs are the most common mechanism firms use to repurchase shares.[4] Once authorized, programs last one year and are limited to the maximum of either 10% of public float or 5% of shares outstanding. Thus, in many cases, the number of authorized shares exceeds 5% of the share base.

TSE rules also govern how listed firms execute their repurchase programs.[5] Briefly, these rules

---

[4] Fixed-price tender offers, referred to as "Substantial Issuer Bids," are also permitted in Canada and do not have limits on the amount of stock that can be repurchased. As in the U.S., this form of repurchase is not common. Dutch-auction tender offers, though permitted by law, have only recently occurred in Canada. In this study, we only examine repurchase programs executed via open market transactions, or Normal Course Issuer Bids.

[5] See Part 28 of the Policies of the Toronto Stock Exchange.

state that TSE firms may commence repurchasing stock two days after receiving approval from the TSE. Programs must be executed through a single broker. Cumulative repurchases over the trailing 30 calendar days must not exceed 2% of the outstanding shares. Firms are also restricted from repurchasing shares on an up-tick. Similar rules exist in the U.S.[6]

b. The Sample

We obtained the complete record of common stock repurchase programs announced by TSE-listed firms between 1989 and 1997. Information regarding all authorized repurchase programs is published periodically in *The Daily Record*, a TSE publication. Once a month, the TSE publishes a comprehensive overview of the status of all authorized programs including the program's size, termination date, the number of share purchased in the previous month (including those purchased on other exchanges) and the total shares repurchased to date in the program. During this time period, 1,159 program authorizations were announced by TSE firms.

Monthly stock returns were obtained from the TSE/University of Western Ontario database, a dataset free of survivor bias. However, our returns from this database end in December 1995. Thus, from January 1996 to December 1998, monthly returns were obtained from Compustat and Datastream. From these sources, we located returns for 1,060 repurchase programs.

Some of our analysis requires fundamental information, specifically the book-to-market ratio. Compustat was our primary source for this information. However, Compustat's coverage of Canadian firms is not complete. In addition, Canadian firms that are de-listed are not included in Compustat's

[6] U.S. securities law governing stock repurchases has evolved gradually, adopting its present form in 1984 when Congress adopted S.E.C. Rule 10b-18, a "safe-harbor" provision relating to stock repurchases. This rule does not impose strict limits as is the case in Canada, but rather provides firms protection from legal liability for price manipulation when repurchasing stock if firms execute repurchase trades within certain limitations relating to price, volume and time-of-day. These provisions are not statutory rules. Companies often voluntarily repurchase shares outside of these limits (Cook, Krigman and Leach, 1997). Moreover, Rule 10b-18 does not apply to all types of repurchase transactions including, for example, pension-plan related (ERISA) trades. In addition, at certain times (for example, following the crash of 1987), some of the Rule 10b-18 limitations are lifted.

research file. For these cases, we obtained book-equity values from a special file prepared for us by Standard and Poor's. As a further step, we hand collected missing book-equity values from Moody's International Manuals. From these sources, book-to-market ratios were obtained for 86% of our sample.

3. Methodology

a. Portfolio formation

Our examination of long-run performance focuses on portfolio returns produced in calendar-time. Several recent papers report evidence based on this approach including Ikenberry, Lakonishok and Vermaelen (1995), Loughran and Ritter (1995), Womack (1996) and Mitchell and Stafford (1997). To use this approach, we calculate monthly returns in calendar-time for a portfolio of repurchase firms. Firms are added to the portfolio at the beginning of the month following their repurchase announcement and retained for the next three years or until the stock no longer trades. At the beginning of each month, the portfolio is rebalanced so that each stock receives the same weight. Over time, new companies enter the portfolio and old companies leave, causing the number of stocks in the portfolio to vary. In some months, the number of stocks in the portfolio is small. To reduce the impact of idiosyncratic noise, particularly when we partition our dataset into various sub-samples, months where a portfolio contains six stocks or less are dropped from our analysis.

The portfolio described above assumes that repurchase firms are held for three years, beginning in the month following the announcement. In addition to this strategy, we calculate portfolio returns for other investment horizons including year 1, year 2 and year 3 following the announcement. For example, for the year 1 portfolio, a monthly time-series of returns is calculated for firms that announced a program in the previous 12 months. Similarly, we also report performance for year -1.

b. Benchmark models and index returns

Using the calendar-time portfolio approach, we estimate abnormal performance using two

benchmarks. We first evaluate performance using a standard one-factor, CAPM approach. Here, we regress the time-series of monthly excess returns to the repurchase portfolio on excess market returns:

$$r_{p,t} - r_{f,t} = \alpha + \beta_m(r_{m,t} - r_{f,t}) + \varepsilon_t \quad (1)$$

where $r_{p,t}$ is the monthly return to a given calendar-time portfolio. The risk-free return, $r_{f,t}$, is the return to the 30-day Canadian government bill. The return to the TSE Index is our market return, $r_{m,t}$. Abnormal performance is measured by α.

The focus of our performance analysis relies on the Fama-French (1993) three-factor model:

$$r_{p,t} - r_{f,t} = \alpha + \beta_m(r_{m,t} - r_{f,t}) + \beta_{vmg}(r_{value,t} - r_{growth,t}) + \beta_{sml}(r_{small,t} - r_{large,t}) + \varepsilon_t \quad (2)$$

The first term in equation (2) controls for general market movements in a given month t. The last two terms in equation (2) are value/growth and size factors. These factors are calculated using BARRA's Canadian style returns for small-cap-value stocks, small-cap-growth stocks, large-cap-value stocks and large-cap-growth stocks.[7] For its Canadian indices, BARRA defines its large-cap universe as the largest 200 firms trading on the TSE. The next largest 300 TSE firms define the small-cap universe. These two groups are each subdivided into growth and value portfolios. BARRA accomplishes this by calculating a measure that gives two-thirds weight to the market-to-book ratio and one-third weight to dividend yield. The small-cap and large-cap portfolios are sorted on this measure and split into two groups so that the value and growth portfolios have the same total market capitalization. For the three-factor model above, the book-to-market factor is defined as the average return for BARRA's two value portfolios (large-cap-value and small-cap-value) minus the average return to BARRA's two growth portfolios (large-cap-growth and small-cap-growth). This factor is labeled as the value minus growth portfolio, or vmg.

---

[7] BARRA is a U.S.-based firm that provides software and information services to investment managers, pension fund consultants, plans sponsors and others in the investment community. The style indices used in this study were obtained from BARRA's Canadian internet site: www.barra.ca. Although not reported in this paper, we examined the behavior of the three-factor model using BARRA style indices. Overall, the model appears to work well in Canada.

Similarly, the size factor is obtained by taking the average return of BARRA's two small-cap portfolios (small-cap, value and small-cap, growth) and subtracting the average return of BARRA's two large-cap portfolios (large-cap-value and large-cap- growth). This factor is labeled as small minus large, or sml. BARRA updates these style indices in January and July of each year. These series start in July of 1990. Thus while we include repurchase programs announced during 1989 and the first half of 1990, we do not begin measuring excess performance until July 1990.[8]

4. The market reaction to open market share repurchase announcements

Panel A of Table 1 reports summary statistics for our repurchase sample. Looking at all years together, the 1,060 programs in our sample, if fully completed, amount to $35.6 billion. The mean program is for 5.22% of shares outstanding, similar in magnitude to the typical open market repurchase program in the U.S. The mean market reaction to open market programs in our sample is modest. The average abnormal return relative to the TSE index in the month the program is announced is 0.93%.[9] This is somewhat less that the market reaction observed for U.S. announcements.

Panel B reports the mean market reaction for various program sizes. A substantial number of programs cluster right at 5% of shares outstanding. Thus, we report evidence for all programs announced for between 4.5% and 5.5% of the share base. Those programs below 4.5% or above 5.5% are reported

[8] To maximize the number of repurchase firms in our sample, we begin recording repurchase announcements in January 1989, the first month for which copies of *The Daily Record* were available from the TSE archives. We begin measuring performance in July 1990 when the BARRA style factors are available. Of course, an alternative to using BARRA factors would be to construct our own factors, thus allowing us to measure performance for 18 more months prior to July 1990. While possible, the portfolios would have less seasoning and, thus, be less populated and more noisy. Moreover, for much of the 1990 to 1998 period, BARRA calculates and reports its style factors in real-time, thus reducing concerns over potential biases.

[9] As a check, we also calculated the market reaction adjusting for book-to-market and size effects. Using Ibbotson's (1975) RATS technique, the market reaction is nearly the same as obtained using the simple market-adjusted approach, 1.05%.

in two separate groups. There is little apparent difference in the market reaction between large and small programs. The mean abnormal return for programs between 0 and 4.5% of shares outstanding is 0.90%. For the largest programs in our sample, those for more than 5.5% of shares outstanding, the mean market reaction is slightly lower, 0.69%.

In spite of managers' frequent claims of undervaluation when announcing a repurchase program, the announcement return is small. This is consistent with managers either being overly optimistic relative to the market about their firm's value or, alternatively, the market being wrong and thus underreacting to the repurchase signal. An investigation of the long-term performance of repurchasing firms is a way to sort out the two competing hypotheses.

5. The long-term performance of Canadian open market repurchasing firms

a. The general case

In Table 2, we report performance of the repurchase strategy using both one-factor and three-factor models. Assuming a three-year holding period, we observe abnormal performance using the one-factor model of 0.62% per month (t = 2.70). Using a two-year holding period, our estimate of abnormal performance is slightly higher, 0.70% per month (t = 2.90). Focusing on one-year holding periods, abnormal performance is positive in each of the three years following the announcement.

After controlling for both size and book-to-market using the three-factor model, the results are generally the same. The three-year holding period strategy shows abnormal performance of 0.59% per month (t = 4.11) or roughly 7% per year. In this study, the similarity between the one- and three-factor models is not unexpected given the relatively small premiums associated with the additional two factors.

The mean return on the vmg factor during our sample period was less than 1.5% per year while the mean return to the sml factor was nearly zero, -0.25% per year. Given these modest premiums, alternative approaches to adjust for size and value-growth should not substantially change the results.

A calendar-time approach weighs each month equally in the analysis even though the number of companies in the portfolio is not the same over time. Thus, in Table 3, we report evidence using an event-time methodology where each announcement receives the same weight. Here, we apply Ibbotson's Returns Across Time and Securities (RATS) procedure (1975) and, as before, measure abnormal performance using a three-factor model. Using this procedure, we continue to observe evidence of positive abnormal returns. After three years, the total cumulative abnormal return is 21.40% (t = 6.87). This translates to an abnormal return of 0.59% per month, a result which exactly matches that obtained using the calendar-time approach.

To examine the robustness of our results, we performed additional tests in the context of the calendar-time approach. We estimated abnormal performance using weighted least-squares to deal with the problem of an uneven number of securities in the portfolio over time. We also calculated performance using a value-weighted portfolio strategy. In both cases, the results were similar to our basic approach.

b. Cross-sectional differences in long-run performance: value versus growth

One way to sort out the different motivations managers have for repurchasing shares is to consider the book-to-market ratio. Managers in growth firms, with relatively low book-to-market ratios, may repurchase shares for a variety of reasons such as avoiding dilution of earnings. For value companies where book-to-market ratios are relatively high, undervaluation may be a more important motivating factor.

Thus, in June of each year, we obtain book-to-market ratios (assuming a three-month reporting

delay following fiscal year-end for book-equity values) for all TSE-listed firms for which we have data. This universe is sorted each year by book-to-market ratio. Those firms with above median book-to-market ratios are called value stocks, while those with below average ratios are labeled growth stocks. For each of these two groups, we estimate long-run performance using the calendar-time approach, the results of which are reported in Table 4.

Value companies announcing a repurchase program substantially outperform growth companies. Assuming a three-year holding period, the abnormal return for value stocks using the three-factor model is 0.76% per month or 9% per year. For growth stocks, the comparable return is less than half this amount, 0.28% per month. This spread between value and growth firms in Canada announcing buybacks is consistent with the pattern observed for U.S. firms (Ikenberry, Lakonishok and Vermaelen (1995)).

Prior to the announcement, we also see evidence consistent with the undervaluation story.[10] Although, value firms perform well subsequent to a program announcement, performance in the prior year is poor; -0.91% per month (t=-3.80). Growth firms, on the other hand, perform well in the year prior to the announcement with abnormal performance of 0.51% per month (t=2.19).

6. Actual share repurchase activity in Canada

a) The evolution of repurchase activity over time and completion rates

Canadian law differs from the U.S. in that the progress of all authorized repurchase programs is reported each month regardless of whether firms are buying shares or not. This information is summarized in Table 5. Panel A reports the distribution of repurchase completion rates. The fraction of shares actually repurchased is surprisingly low. At termination of the program, roughly a quarter of the

[10] Similar evidence of negative abnormal returns prior to repurchase announcements is reported by Vermaelen (1981) and Comment and Jarrell (1991).

firms did not repurchase any shares. Less than 5% of the firms fully complete their repurchase program. Overall, the mean completion rate is 28.6%. For comparison, Stephens and Weisbach (1998) report one-year completion rates ranging between 46% and 75% for a sample of U.S. programs announced between 1981 and 1995.[11]

Panel B reports cumulative repurchase activity at various points during the program. This is reported for the overall sample and for various sub-samples. Slightly less than half of all repurchase activity occurs during months 0 to 3. The completion rate in Canada has increased over time. In the first two years, it was 21.4% whereas in the last two years it increased to 35.1%. Perhaps a more interesting result relates to the difference in completion rates between value and growth stocks. Value stocks have a higher completion rate, 30.9%, in comparison to growth stocks, 25.1%. Extreme value stocks, defined as companies in the top book-to-market decile, have an even higher completion rate of 37.7%. On the other hand, extreme growth stocks have an average completion rate of only 19.6%. The difference in completion rates between value and growth firms, both overall as well as in extreme cases, is significant at traditional confidence levels.

b) The determinants of completion rates and strategic trading

Next, we consider in greater detail factors that influence repurchase completion rates. If undervaluation is an important reason leading managers to repurchase stock, one would expect price movements during the program to be an important consideration. A run-up in stock prices after a repurchase announcement would seemingly diminish the attractiveness of buying shares. Conversely, a drop in prices would provide an increased incentive to buy stock. Thus, the first factor we consider is the excess stock return during the year of the program relative to the TSE index, which we label as Year 1

[11] Because U.S. firms are not required to disclose repurchase activity directly, Stephens and Weisbach (1998) use a variety of approaches to estimate completion rates for U.S. stocks.

Excess Return.

The next two variables considered are the firm's Book-to-Market Decile Rank and Size Decile Rank compared to all TSE firms as of the previous June. Earlier, we observed that repurchasing firms with high book-to-market ratios experienced higher post-announcement abnormal returns compared to firms with lower ratios, a result consistent with undervaluation. If undervaluation is an important motive for buybacks in value companies, we expect them to have higher completion rates compared to growth stocks where the motives for buying stock are more complicated. We saw traces of this behavior earlier in Table 5. The variable Size Decile Rank also relates to the undervaluation hypothesis. Evidence suggests that smaller firms are less efficiently priced. Thus, one might expect to see higher completion rates among smaller firms in comparison to larger, more efficiently priced firms.

Two additional control variables are included in the regressions reported in Table 6. The dummy variable, Repeat, is assigned a value of one if the company announced a repurchase within the past 15 months. Our sample contains quite a few firms with consecutive program announcements, including Seagrams for example. It is possible that managers in these companies are behaving opportunistically (Ikenberry and Vermaelen (1996)) and will attempt to buy shares only if prices fall. Thus, lower completion rates are expected from such bargain-hunter like companies. A similar rationale exists for the second control variable, Program Size, the percentage of outstanding shares authorized for repurchase, is similar. Some firms may authorize program amounts than are greater than they initially intend to buy, completing the full program only if prices fall. Thus, we expect to find lower completion rates for large authorizations.

The regression evidence reported in Table 6 is generally consistent with the undervaluation story. The coefficient for Year 1 Excess Return is negative suggesting greater repurchase activity as prices fall. The impact of book-to-market is positive as expected, even after controlling for other factors. Moreover,

given that the unconditional completion rate is 28.6%, the impact of book-to-market is material. For example, a move from the lowest to the highest book-to-market decile changes the estimated completion rate by 10.9% (0.0121 x 9). Similarly, size is also important; a move from the highest to lowest size decile rank increases the expected completion rate by 6.0% (-0.0067 x -9). These results suggest that completion rates depend on whether managers perceive their stock to be undervalued. The results also suggest that companies with repeat announcements and those that authorized large programs end up buying less.

To further investigate the possibility of strategic repurchase behavior by managers, we focus on month to month repurchase activity. Such data allow us to assess the extent to which managers trade in response to price movements before, during and subsequent to a given month. Thus, we estimate equation (3):

$$\text{Bought}_{i,t} = \alpha + \hat{a}_1 \bullet \text{Repeat}_i + \hat{a}_2 \bullet \text{Program Size}_i + \hat{a}_3 \bullet \text{Size Rank}_i + \hat{a}_4 \bullet \text{B/M Rank}_i + \hat{a}_5 \bullet \text{Excess Return}_{i;t-1,t-k} + \hat{a}_6 \bullet \text{Excess Return}_{i;t} + \hat{a}_7 \bullet \text{Excess Return}_{i;t+1,t+k} \quad (3)$$

where $\text{Bought}_{i,t}$ is the portion of the program firm i repurchased in month t. Our key variables of interest are price changes in the current month t measured relative to the TSE index, $\text{Excess Return}_{i;t}$, and similarly, excess returns preceding and following month t, $\text{Excess Return}_{i:t-1,t-k}$ and $\text{Excess Return}_{i:t+1,t+k}$, respectively. We consider three horizons for these leading and trailing windows: one month, three months and six months. As in Table 6, we control for size, book-to-market, program size and repeat.[12] Evidence is reported in Table 7 for all months in the program pooled together as well as for the first-half

[12] Months where a firm had already purchased 90% or more of its authorized program are eliminated from this analysis as these programs are essentially completed.

and second-half of the program. Overall, managers trade strategically in response to market movements; as prices fall, managers respond by buying more stock. This is true for price movements both in the current month and in preceding months. In addition, these regression coefficients are highly significant. Regression coefficients for each of the forward excess return horizons are essentially zero indicating the difficulty in predicting future stock prices over relatively short horizons.

Managers respond differently to stock price movements in the first half versus second half of the program. Generally speaking, response coefficients for both concurrent and past excess returns in months 7 to 12 are double that observed in months 0 to 6. Moreover, coefficient estimates from this later period are quite material. For example, the expected increase in the monthly completion rate for a company with an excess market return of -50% over the previous 3 months and a concurrent excess monthly return of -20% is roughly 1%. Given that the unconditional repurchase rate in months 7 to 12 is roughly 1.6% per month, such a move in stock prices translates to roughly a 65% increase in the rate of repurchase activity. One reason for this increased sensitivity is because early in the program, the possibility to postpone repurchases to later months exists. Later in the program, this option begins to expire. As a result, repurchase activity becomes more sensitive to price movements.

Overall, these results point to underpricing as a motivating factor for managers to repurchase shares. If non-valuation reasons had a predominant effect on repurchase activity, one would not expect to see such behavior. For example, if managers thought that the market efficiently priced their stock and were using repurchases as means of returning capital to shareholders in lieu of a dividend, we would not expect to see repurchase activity linked to market movements. However, this not the case. We see rather substantial swings in repurchase levels associated with past and current market movements. These results suggest that managers are indeed cognizant of market prices and execute trades accordingly.

7. Long-term performance conditional on program completion

In this section, we further investigate the role of undervaluation and the extent to which managers strategically repurchase stock by examining performance using the three-factor model conditional on completion rates. If managers are repurchasing strategically, we expect them to buy more shares as prices decline. Similarly, we expect them to repurchases fewer shares as prices rise and mispricing dissipates. Thus, in Table 8, we report evidence for three scenarios. First, we consider cases where firms repurchased no shares at all after authorizing a program. The remaining programs are sorted into two groups; those cases where managers bought less than 30% versus where they were more aggressive and bought more than 30% of the authorized amount.

Focusing on abnormal performance in year 1, noticeable differences are observed across the three groups. For cases where no shares were repurchased, abnormal performance is 0.96% per month (t = 2.99) or nearly 12% per year. Yet, abnormal performance in year 1 decreases as we move to cases where firms were active buyers. For those completing more than 30% of their program, the abnormal monthly return is 0.22% per month (t=1.07).

Interestingly, after the programs have expired, there is no evidence of abnormal performance in cases where no shares were repurchased. Yet, in cases where companies did repurchase shares, substantial abnormal returns are observed in years 2 and 3 after the program is over. This pattern in returns is consistent with evidence reported earlier and suggests that managers are sensitive to stock prices.

In Table 9, we provide one last piece of evidence of strategic trading behavior by focusing on trading during the last-half of the repurchase program. We partition our sample into two groups: companies that bought shares in the last six months of the program versus companies that had no

repurchase activity during this period.[13] For cases where firms were active buyers late in the program, we expect to see relatively low return performance during months 7 to 12, followed by high abnormal returns in years 2 to 3. Conversely for those cases where no shares were bought after month 6, we expect to see higher abnormal performance in months 7 to 12 and comparatively modest returns in years 2 to 3.

For both groups, abnormal returns during months 1 to 6 are similar; 0.47% per month in cases of no further buying and 0.56% in cases of at least some further buying. However, abnormal performance between the two groups diverges as expected in months 7 to 12. Firms that purchased no shares during this period report abnormal performance of 1.14% per month(t=2.98). Yet firms which did buy shares during this period have essentially no abnormal performance, -0.09% (t=-0.28). Moreover, if we look at abnormal returns subsequent to the repurchase program in years 2 and 3, we see substantial excess performance in cases where firms were buying in months 7 to 12 of 0.87% per month (t=3.89) compared to cases where no further buying occurred, 0.26% (t=1.18).

In short, the evidence suggests that managers do appear to repurchase shares in response to undervaluation. Moreover, managers seem to execute their trades strategically and are sensitive to price movements.

8. A robustness check: The long-term performance Canadian equity issuances

As a final check, we examine cases where Canadian firms issued shares. A result consistent with the repurchase evidence would show a downward drift in stock prices subsequent to an issuance of shares. We look at firms that issued seasoned equity or issued shares to finance acquisitions. Several

[13] Here, only companies which bought less than 15% of their total program by month 6 are included. This allows us to focus on cases where the vast majority of the program remains available for repurchase during the last half of the program. Sample sizes for the repurchase and no repurchase groups are 259 and 399, respectively.

studies using U.S. data report a downward drift following seasoned equity offerings, including Loughran and Ritter (1995) and (1998) and Spiess and Affleck-Graves (1995). Following acquisitions by U.S. firms, papers such as Agrawal, Jaffe and Mandelker (1992) and Rau and Vermaelen (1998) also report a deterioration in performance.

Our sample was obtained from Securities Data Co. and covers the period 1989 to 1995. For both offerings and acquisitions, we limit our sample to cases where the transaction involved at least $10 million. Moreover, because of our focus on the issuance of equity, we remove acquisitions where stock comprised less than one-third of the financing in the transaction. Over our sample period, there were 134 offerings and 27 acquisitions for which we could obtain return data.[14]

Table 10 reports long-run abnormal performance using the three-factor model for offerings and stock acquisitions together as well as separately. For the two events combined, abnormal performance during the three-year post-announcement period is -0.54% per month (t = -2.60). This is similar, though opposite in sign, to those cases where managers are repurchasing shares (0.59% per month). Prior to the announcement, we see positive and significant abnormal performance, 1.11% per month (t = 1.98). This compares with negative abnormal performance prior to the announcement of a stock repurchase. Looking at equity offerings and acquisitions separately, the results are consistent with the overall sample. For equity offerings, the results are more dramatic. Prior to the announcement, abnormal returns are higher in comparison to acquisitions. Following the announcement, abnormal performance is comparatively lower.

Overall, this evidence is consistent with the hypothesis that managers' decisions to expand or contract the firm's equity base depend on the market valuation of the stock. In cases where prices

[14] Securities Data reports many more acquisitions than included here. Nearly all of these deals were cash deals or involved the acquisition of very small firms.

appear to be cheap, managers tend to repurchase shares. Conversely, when prices are high, managers tend to issue shares.

9. Conclusions

Stock repurchases are an important corporate event and have been announced with increasing frequency in recent years. In the U.S. between 1996 to 1998, companies announced nearly 4,000 repurchase programs amounting to $550 billion. This trend is apparent worldwide as many countries have recently adopted new laws allowing firms to repurchase stock. Earlier research reports evidence of abnormal returns following open market repurchase announcements made by U.S. firms in the 1980s, suggesting underreaction by markets. In this paper, we provide out-of-sample evidence by focusing on repurchases announced by Canadian firms during the 1990s.

The Canadian experience is similar to the earlier evidence obtained for U.S. buybacks. The initial market reaction to repurchase programs is small; the abnormal return is less than 1% in the announcement month. The market, on average, seems to underestimate the information contained in repurchase announcements. Using a three-factor model, abnormal performance over a three-year holding period is about 7% per year. For comparison, we also examine cases where Canadian firms issued shares. Consistent with well-documented findings in the U.S., long-run abnormal stock returns for these cases are negative.

Of course, undervaluation is not the only motive managers have for repurchasing stock. Other considerations may also be at work. However, better long-run performance is expected from repurchases that are driven more by undervaluation than by other motives. For example, one might expect undervaluation to be a more important factor for value stocks choosing to buy back shares than for growth stocks. Our results are consistent with this hypothesis. Companies with high book-to-market

ratios that announced a repurchase program tend to experience higher post-announcement abnormal returns than low book-to-market firms.

Aside from providing out-of-sample evidence on stock returns, repurchases in Canada are particularly interesting to study because of the legal requirement that firms report their trading activity on a monthly basis. These unique data enable us to better understand what drives repurchases. If managers believe that markets are efficient, we would not expect to see price changes impact trading activity. However, the evidence suggests otherwise. Completion rates are higher in cases where undervaluation may have been a primary motive for the repurchase, such as in value stocks and small-cap stocks, for example. Moreover, monthly trading activity depends on price changes, suggesting that managers behave strategically. When prices rise, managers tend to buy fewer shares whereas a drop in prices triggers an increase in repurchase activity. This sensitivity to stock prices suggests that perceived undervaluation by managers is an important consideration for buybacks.

REFERENCES

Agrawal, Anup, Jeffrey F. Jaffe and Gershon N. Mandelker, 1992, The post-merger performance of acquiring firms in acquisitions: A re-examination of an anomaly, *Journal of Finance* 47, 1605-1621.

Comment, Robert and Gregg A. Jarrell, 1991, The relative signalling power of Dutch auction and fixed price tender offers and open market share repurchases, Journal of Finance 46, 1243-1271.

Cook, Douglas O. and Laurie Krigman and J. Chris Leach, 1997, Safe-harbor or smoke screen? Compliance and disclosure under SEC rule 10b-18, University of Colorado working paper.

Dann, Larry Y., 1983, Is your common stock really worth buying back?, *Directors & Boards* 7, no. 4, 23-29.

Fama, Eugene F., 1998, Market efficiency, long-term returns, and behavioral finance, *Journal of Financial Economics* 49, 283-306.

Fama, Eugene F. and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56.

Goldman Sachs Investment Research, Special Topic: Europe uses its balance sheet, Europe/UK Portfolio Strategy, March 12, 1999.

Ibbotson, Roger G., 1975, Price performance of common stock new issues, *Journal of Financial Economics* 2, 235-272.

Ikenberry, David, Josef Lakonishok and Theo Vermaelen, 1995, Market underreaction to open market share repurchases, *Journal of Financial Economics* 39, 181-208.

Ikenberry, David and Theo Vermaelen, 1996, The option to repurchase stock, *Financial Management* 25, no. 4, (Winter), 9-24.

Lakonishok, Josef and Theo Vermaelen, 1990, Anomalous price behavior around repurchase tender offers, *Journal of Finance* 45, 455-477.

Loughran, Tim and Jay R. Ritter, 1995, The new issues puzzle, *Journal of Finance* 50, 23-51.

Loughran, Tim and Jay R. Ritter, 1998, Uniformly least powerful tests of market efficiency, University of Florida working paper.

Merton, Robert, 1985, On the current state of stock market rationality hypothesis, unpublished working paper, #1717-85.

Mitchell, Mark L. and Erik Stafford, 1997, Managerial decisions and long-term stock price performance, University of Chicago working paper #453.

Rau, P. Raghavendra and Theo Vermaelen, 1998, Glamour, value and the post-acquisition performance of

acquiring firms, *Journal of Financial Economics* 49, 223-253.

Spiess, D. Katherine and John Affleck-Graves, 1995, Underperformance in long-run stock returns following seasoned equity offerings, *Journal of Financial Economics* 38, 243-267.

Stephens, Cliff and Weisbach, M., 1998, Actual share reacquisitions in open-market repurchase programs, *Journal of Finance* 53, 313-333.

Vermaelen, Theo, 1981, Common stock repurchases and market signalling, Journal of Financial Economics 9, 139-183.

Wansley, James W., William R. Lane and Salil Sarkar, 1989, Management's view of share repurchase and tender premiums, *Financial Management* 18, 97-110.

Womack, Kent, 1996, Do brokerage analysts' recommendations have investment value?, *Journal of Finance* 51, 137-167.

</ref_section>

Table 1

Summary Information for
Open Market Stock Repurchase Programs
Announced by TSE-listed Firms

This table reports summary information for sample firms listed on the Toronto Stock Exchange that announced an open market stock repurchase program (normal course issuer bid) during the period 1989 to 1997. Reported are the number of firms, the mean percentage of outstanding shares announced for repurchase, the cumulative dollar amount (Canadian $ million), the mean abnormal announcement return and its associated *t*-statistic. The mean abnormal announcement return is the average total return for sample firms in the announcement month adjusted for the respective TSE index total return. Panel A reports this summary information by year. Panel B reports it by program size.

Panel A: *By Year*

Year	n	Mean % Announced for Repurchase	Dollar Return Amount	Mean Abnormal Announcement (%)	*t*-stat
1989	106	5.54	3,983.5	1.27	(1.60)
1990	144	5.32	5,136.8	1.20	(1.16)
1991	92	5.10	1,715.1	2.29	(1.33)
1992	79	4.95	1,200.4	3.87	(2.85)
1993	62	5.05	1,458.7	2.23	(1.29)
1994	110	5.22	2,755.1	-1.71	(-1.41)
1995	166	5.34	3,896.3	0.14	(0.15)
1996	129	4.98	5,828.8	0.18	(0.22)
1997	172	5.26	9,660.3	0.96	(0.78)
All	1,060	5.22	35,635.0	0.93	(2.36)

Panel B: *By Program Size*

Less than 4.5%	194	2.58	8,864.5	0.90	(1.21)
4.5 to 5.5%	603	4.98	15,662.1	1.05	(1.94)
More than 5.5%	263	7.72	11,348.4	0.69	(0.83)
All	1,060	5.22	35,635.0	0.93	(2.36)

Table 2

Long-run Performance of TSE-listed Firms
Announcing Open Market Stock Repurchase Programs

Portfolios are formed in calendar time for TSE-listed firms announcing an open market stock repurchase program. As time proceeds, firms are introduced to a portfolio at various points relative to the announcement month. For example, for the portfolio labeled year 1, firms are included in the portfolio at the beginning of the month following the announcement (month 1) and remain in the portfolio until month 12. Portfolios are also formed for year 2 (months 13 to 24), year 3 (months 25 to 36), years 1 to 2 (months 1 to 24), years 1 to 3 (months 1 to 36) and year -1 (months -12 to -1). Excess performance (in %) is measured using both a one-factor CAPM approach and a three-factor model as suggested by Fama and French (1993):

$$r_{p,t} - r_{f,t} = \alpha + \hat{a}_m(r_{m,t} - r_{f,t}) + \varepsilon_t$$

$$r_{p,t} - r_{f,t} = \alpha + \hat{a}_m(r_{m,t} - r_{f,t}) + \hat{a}_{vmg}(r_{value,t} - r_{growth,t}) + \hat{a}_{sml}(r_{small,t} - r_{large,t}) + \varepsilon_t$$

where $r_{p,t} - r_{f,t}$ is the excess portfolio return in month t, $(r_{m,t} - r_{f,t})$ is the monthly excess return to the TSE. In the three-factor model, $(r_{small,t} - r_{large,t})$ and $(r_{value,t} - r_{growth,t})$ are size and book-to-market factors respectively. Both factors are derived from large-cap-value, large-cap-growth, small-cap-value and small-cap-growth style indices defined by BARRA using 500 TSE-listed firms. The value minus growth factor is calculated by taking the difference between the average small-cap-value and large-cap-value indices and the average small-cap-growth and large-cap-growth indices. Likewise, the small minus large factor is calculated by differencing the average small-cap-value and small-cap-growth indices with the average large-cap-value and large-cap-growth indices. Calendar-time portfolios are constructed beginning July 1990 and ending December 1998. Months where the portfolios contained 6 or fewer stocks are ignored. *t*-statistics are provided in parentheses and test the hypothesis that the parameter value is zero, except for $\hat{a}_m$ where the hypothesis test value is 1.0.

		Year -1		Year 1		Year 2		Year 3		Years 1 to 2		Years 1 to 3	
All Firms	α	-0.100	(-0.39)			0.700	(2.98)	0.693	(2.58)	0.575	(2.03)	0.695	(2.90)	0.616	(2.70)
	$\hat{a}_m$	0.82	(-2.34)			0.79	(-3.57)	0.77	(-3.46)	0.75	(-3.65)	0.78	(-3.69)	0.78	(-3.98)
	R^2	.57				.65		.58		.55		.64		.66	
	α	-0.348	(-2.09)			0.671	(4.25)	0.671	(3.69)	0.498	(2.02)	0.669	(4.44)	0.587	(4.11)
	$\hat{a}_m$	0.93	(-1.43)			0.89	(-2.65)	0.87	(-2.70)	0.85	(-2.27)	0.88	(-3.01)	0.88	(-3.35)
	$\hat{a}_{vmg}$	0.01	(0.12)			0.05	(0.68)	-0.01	(-0.12)	0.08	(0.65)	0.02	(0.30)	0.05	(0.72)
	$\hat{a}_{sml}$	0.77	(10.07)			0.70	(10.53)	0.78	(10.11)	0.59	(5.33)	0.74	(11.66)	0.72	(11.94)
	R^2	.83				.84		.81		.66		.86		.86	

Table 3

Abnormal Performance for TSE-listed Repurchases Estimated Using RATS

Monthly returns (in %) for sample firms are aligned in event-time, where month 0 represents the announcement month. Abnormal performance is measured monthly using Ibbotson's (1975) Returns Across Time and Securities, or RATS, methodology and applying the Fama-French (1993) three-factor model:

$$r_{i,t} - r_{f,t} = \acute{a}_t + \hat{a}_t(r_{m,t} - r_{f,t}) + \hat{a}_{vmg,t}(r_{value,t} - r_{growth,t}) + \hat{a}_{sml,t}(r_{small,t} - r_{large,t}) + \mathring{a}_t$$

Here, $r_{i,t} - r_{f,t}$ is the excess return to firm i in month t. For that same month, $(r_{m,t} - r_{f,t})$ is the excess return to the TSE, $(r_{small,t} - r_{large,t})$ is the return for the size factor and $(r_{value,t} - r_{growth,t})$ is the return to the book-to-market factor, respectively. Both factors are derived from large-cap-value, large-cap-growth, small-cap-value and small-cap-growth indices defined by BARRA using the 500 firms included in the TSE index. The value minus growth factor is calculated by taking the difference between the average small-cap-value and large-cap-value indices and the average small-cap-growth and large-cap-growth indices. Likewise, the small minus large factor is calculated by differencing the average small-cap-value and small-cap-growth indices with the average large-cap-value and large-cap-growth indices. Using this approach, $\acute{a}_t$ is our estimate of abnormal return (AR) which is estimated each month and cumulated over time (CAR).

Month	AR	*t*-stat	CAR	*t*-stat	
1	1.49	(2.32)		1.49	(1.89)
2	0.94	(1.80)		2.43	(2.57)
3	0.36	(0.76)		2.79	(2.64)
4	0.19	(0.47)		2.98	(2.63)
5	0.75	(1.85)		3.73	(3.10)
6	-0.14	(-0.33)		3.59	(2.83)
9	0.31	(0.65)		5.37	(3.63)
12	0.65	(1.59)		7.27	(4.39)
15	0.81	(1.78)		9.09	(4.97)
18	0.26	(0.55)		10.81	(5.45)
21	0.29	(0.63)		13.20	(6.14)
24	0.05	(0.11)		14.91	(6.50)
27	1.15	(1.26)		17.91	(6.80)
30	-0.49	(-1.00)		18.59	(6.71)
33	0.58	(1.16)		19.48	(6.72)
36	-0.01	(-0.01)		21.40	(6.87)

Table 4

Abnormal Long-run Performance
for Value versus Growth Repurchase Programs

Portfolios are formed in calendar time for TSE-listed firms that announce an open market stock repurchase program. In June of each year, value and growth cut-off values are determined by sorting TSE-listed stocks into two groups on the basis of book-to-market. Those with relatively low book-to-market ratios are labeled Growth Stocks while the rest are labeled Value Stocks. Excess performance (in %) is measured using a three-factor model:

$$r_{p,t} - r_{f,t} = \alpha + \hat{a}_m(r_{m,t} - r_{f,t}) + \hat{a}_{vmg}(r_{value,t} - r_{growth,t}) + \hat{a}_{sml}(r_{small,t} - r_{large,t}) + \varepsilon_t$$

where $r_{p,t} - r_{f,t}$ is the excess portfolio return in month t, $(r_{m,t} - r_{f,t})$ is the monthly excess return to the TSE. In the three-factor model, $(r_{small,t} - r_{large,t})$ and $(r_{value,t} - r_{growth,t})$ are size and book-to-market factors, respectively. Both factors are derived from large-cap-value, large-cap-growth, small-cap-value and small-cap-growth style indices defined by BARRA using 500 TSE-listed firms. The value minus growth factor is calculated by taking the difference between the average small-cap-value and large-cap-value indices and the small-cap-growth and large-cap-growth indices. Likewise, the small minus large factor is calculated by differencing the average small-cap-value and small-cap-growth indices with the average large-cap-value and large-cap-growth indices. Calendar-time portfolios are constructed beginning July 1990 and ending December 1998. Months where the portfolios contained 6 or fewer stocks are ignored. *t*-statistics are provided in parentheses and test the hypothesis that the parameter value is zero, except for $\hat{a}_m$ where the hypothesis test value is 1.0.

		Year -1		Year 1	Year 2		Year 3		Years 1 to 2		Years 1 to 3			
Value	α	-0.913	(-3.80)		0.820	(3.42)	0.894	(3.17)	0.661	(2.31)		0.810	(3.74)	0.762	(3.77)
Stocks	$\hat{a}_m$	0.80	(-2.66)		0.81	(-3.09)	0.80	(-2.70)	0.77	(-2.93)		0.82	(-3.35)	0.81	(-3.64)
	$\hat{a}_{vmg}$	0.01	(0.02)		0.18	(1.65)	-0.10	(-0.74)	0.02	(0.15)		0.07	(0.65)	0.08	(0.83)
	$\hat{a}_{sml}$	0.66	(6.06)		0.65	(6.44)	0.71	(5.92)	0.69	(5.37)		0.69	(7.58)	0.72	(8.44)
		.64			.64		.60		.58			.71		.74	
Growth	α	0.509	(2.19)		0.349	(1.95)	0.315	(1.69)	0.040	(0.19)		0.374	(2.59)	0.276	(2.13)
Stocks	$\hat{a}_m$	0.99	(-0.09)		0.98	(-0.53)	0.97	(-0.64)	0.90	(-1.79)		0.96	(-1.07)	0.95	(-1.53)
	$\hat{a}_{vmg}$	-0.04	(-0.38)		-0.10	(-1.18)	0.10	(1.22)	0.05	(0.51)		0.00	(0.00)	0.03	(0.48)
	$\hat{a}_{sml}$	0.63	(5.92)		0.56	(7.33)	0.69	(8.74)	0.42	(4.42)		0.64	(10.42)	0.58	(10.65)
		.73			.83		.82		.76			.88		.90	

Table 5

Stock Repurchase Completion Rates in Canada

This table reports cumulative share purchase activity (in %) by month for sample firms. Normal course issuer bids are defined to last exactly one year. Thus, months 0 and 12 are partial months. This table reports activity for all firms, including those that departed the sample prior to one full year. Repurchase activity is reported overall, by year, by program size, by market-capitalization and by whether the firm is ranked as value or growth. Market-cap is determined using June cut-off values each year for all TSE-stocks. Firms below median market-cap in a given June are labeled as Small-cap while those with above median market-cap are labeled Large-cap. Similarly, each June, all TSE-listed firms are used to determine book-to-market cut-off values. Those repurchase firms whose book-to-market ratio is below median are labeled Growth while those above median are labeled Value. Extreme value and Extreme growth are those firms whose book-to-market ratio ranks them in the highest or lowest deciles respectively compared to all TSE-listed stocks in a given June.

Panel A: Completion rate (in %) after 12 months

Portion of program completed	n		Mean
No shares repurchased	236	(22.3%)	0.0
0 to 5%	149	(14.1%)	2.1
5 to 10%	90	(8.5%)	7.4
10 to 25%	161	(15.2%)	16.7
25 to 50%	171	(16.1%)	35.4
50 to 75%	99	(9.3%)	63.0
75 to 100%	154	(14.5%)	93.4
All firms	1,060	(100%)	28.6

Panel B: Cumulative Trading Activity

Program	% of Program Completed by Month					Size (%)		0
1	2	3	6	9	12			
All programs	5.22	2.3	5.8	9.0	11.9	19.1	24.8	28.6
Years 1989-91	5.33	1.8	4.3	6.7	8.9	14.3	18.7	21.4
Years 1992-93	4.99	1.0	3.8	6.9	9.5	17.4	22.8	26.2
Years 1994-95	5.29	3.4	7.4	10.7	14.3	22.2	28.0	31.8
Years 1996-97	5.14	2.4	7.0***	10.9***	14.2***	22.5***	29.7***	35.1***
Programs less than 4.5%	2.58	2.7	7.0	10.3	14.6	25.0	32.5	37.9
Programs between 4.5 and 5.5%	4.98	2.1	5.3	8.2	10.8	17.4	22.4	25.8
Program greater than 5.5%	7.72	2.5	6.2	9.6	12.6	18.7***	24.6***	28.3***
Small-cap	5.32	2.6	6.3	9.6	12.7	19.9	25.9	29.6
Large-cap	5.05	1.8**	5.0	7.8	10.5	17.8	22.9	26.9
Growth	5.06	2.3	5.3	8.1	10.2	17.0	21.8	25.1
Value	5.31	2.2	6.3	9.5	12.8**	20.1	26.3**	30.9***
Extreme growth	5.12	3.6	8.2	11.6	13.8	16.5	18.2	19.6
Extreme value	5.33	3.2	7.4	11.6	16.1	25.9**	32.9***	37.7***

** and *** denote significance at the .05 and .01 levels, respectively, for differences in completion rates between the top and bottom rows of a given sub-panel.

Table 6

Determinants of Program Completion Rates

This table reports coefficients for regressions of the program completion rate as a function of firm characteristics and stock price performance. Year -1 Excess Return is the firm's total return during the program relative to the TSE index return. Book-to-Market Decile and Size Decile Rank are determined in the prior June. Program size is the fraction of outstanding common stock authorized for repurchase. Repeat is a dummy variable set to one when the program the firm has announced a program within the past 15 months.

	á	Year 1 Excess Return	B/M Decile Rank	Size Decile Rank	Repeat	Program Size
(i)	.2921	-0.0366				
		(-2.56)				
(ii)	.2126		0.0121			
			(2.95)			
(iii)	.3174			-0.0067		
				(-2.03)		
(iv)	.2927				-0.0138	
					(-.68)	
(v)	.3588					-1.6270
						(-3.04)
(vi)	.3566	-0.0332	0.0123	-0.0055	-0.0146	-2.0236
		(-2.12)	(2.93)	(-1.50)	(-0.66)	(-3.53)

Table 7

Determinants of Monthly Trading Activity during Stock Repurchases

This table reports regression results for the following model:

$Bought_{i,t} = \alpha + \beta_1 \cdot Repeat_i + \beta_2 \cdot Program\ Size_i + \beta_3 \cdot Size\ Decile\ Rank_i + \beta_4 \cdot B/M\ Decile\ Rank_i + \beta_5 \cdot Excess\ Return_{i;t-1,t-k} + \beta_6 \cdot Excess\ Return_{i;t} + \beta_7 \cdot Excess\ Return_{i;t+1,t+k}$

Where $Bought_{i,t}$ is the fraction (ranging between 0 and 1) firm i repurchased in month t relative to the total program authorization. The first four control variables are defined the same Table 6. The last three terms relate to firm i's excess total return over a given period preceding, coincident and following month t. Excess return is measured relative to the TSE 300 in over the same period. Months where firms have completed 90% or more of the program's stated amount are deleted. Panel A reports evidence for all months 0 through 12. Panel B re evidence using only months 0 to 6 relative to the announcement. Panel C reports evidence for months 7 through 12. *t*-statistics are in parentheses.

	α	β_1 Repeat	β_2 Prog. Size	β_3 Size Decile	β_4 B/M Decile	β_5 Excess Return$_{t-1,t-k}$	β_6 Excess Return$_t$	β_7 Excess Return$_{t+1,t+k}$
Panel A All Months								
k = 1 month	.0265	-0.0016	-0.1515	-0.0003	0.0010	-0.0174	-0.0155	-0.0083
			(-1.51)	(-5.31)	(-1.19)	(4.72)	(-3.97)	(-3.56) (-1.91)
k = 3 months	.0263	-0.0015	-0.1508	-0.0003	0.0010	-0.0095	-0.0148	0.0006
			(-1.34)	(-5.31)	(-3.30)	(4.80)	(-4.00)	(-3.41) (1.26)
k = 6 months	.0266	-0.0015	-0.1652	-0.0002	0.0010	-0.0057	-0.0168	-0.0004
			(-1.38)	(-5.65)	(-0.94)	(4.76)	(-3.49)	(-3.70) (-0.23)
Panel B Months 0 to 6								
k = 1 month	.0344	-0.0043	-0.1912	-0.0003	0.0010	-0.0186	-0.0118	-0.0041
			(-2.63)	(-4.46)	(-1.05)	(3.32)	(-2.92)	(-1.85) (-0.63)
k = 3 months	.0340	-0.0041	-0.1937	-.0003	0.0011	-0.0077	-0.0112	-0.0008
			(-2.50)	(-4.53)	(-0.96)	(3.40)	(-2.32)	(-1.76) (-0.74)
k = 6 months	.0346	-0.0031	-0.1967	-0.0003	0.0010	-0.0031	-0.0110	-0.0026
			(-1.31)	(-4.55)	(-1.10)	(3.12)	(-1.33)	(-1.71) (-1.05)
Panel C Months 7 to 12								
k = 1 month	.0165	0.0019	-0.1018	-0.0001	0.0009	-0.0167	-0.0225	-0.0145
			(1.44)	(-2.93)	(-0.57)	(3.60)	(-2.95)	(-4.06) (-2.73)
k = 3 months	.0165	0.0020	-0.0999	-0.0001	0.0009	-0.0121	-0.0209	0.0004

		(1.53)	(-2.89)	(-0.64)	(3.59)	(-3.81)	(-3.80)	(0.92)
k = 6 months	.0164	0.0018	-0.1260	0.0000	0.0010	-0.0078	-0.0284	0.0026
		(1.34)	(-3.52)	(0.00)	(3.77)	(-3.80)	(-4.74)	(1.23)

Table 8

Long-run Performance Conditional on Completion Rate

Portfolios are formed in calendar time for TSE-listed firms that announced an open market stock repurchase program. Firms are sorted into three portfolios: those that purchased no shares, those that repurchased less than 30% of the authorized amount and those that repurchased more than 30% of the authorized amount. Excess performance (in %) is measured using a three-factor model:

$$r_{p,t} - r_{f,t} = \alpha + \hat{a}_m(r_{m,t} - r_{f,t}) + \hat{a}_{vmg}(r_{value,t} - r_{growth,t}) + \hat{a}_{sml}(r_{small,t} - r_{large,t}) + \varepsilon_t$$

where $r_{p,t} - r_{f,t}$ is the excess portfolio return in month t, $(r_{m,t} - r_{f,t})$ is the monthly excess return to the TSE. In the three-factor model, $(r_{small,t} - r_{large,t})$ and $(r_{value,t} - r_{growth,t})$ are size and book-to-market factors, respectively. Both factors are derived from large-cap-value, large-cap-growth, small-cap-value and small-cap-growth style indices defined by BARRA using 500 TSE-listed firms. The value minus growth factor is calculated by taking the difference between the average small-cap-value and large-cap-value indices and the small-cap-growth and large-cap-growth indices. Likewise, the small minus large factor is calculated by differencing the average small-cap-value and small-cap-growth indices with the average large-cap-value and large-cap-growth indices. Calendar-time portfolios are constructed beginning July 1990 and ending December 1998. Months where the portfolios contained 6 or fewer stocks are ignored. *t*-statistics are provided in parentheses and test the hypothesis that the parameter value is zero, except for $\hat{a}_m$ where the hypothesis test value is 1.0.

		Year -1		Months 1-6		Months 7-12		Year 1		Years 2 to 3			
No shares	α	-0.442	(-1.20)	0.986	(2.07)	0.762	(1.69)	0.959	(2.99)	0.046	(0.20)		
repurchased	$\hat{a}_m$	0.98	(-0.21)	1.11	(0.73)	1.09	(0.82)	1.08	(1.02)	0.97	(-0.52)		
during	$\hat{a}_{vmg}$	0.16	(0.91)	0.00	(0.01)	0.03	(0.13)	0.17	(1.09)	.24	(2.24)		
program	$\hat{a}_{sml}$	0.74	(4.44)	0.92	(4.44)	0.90	(4.85)	0.96	(7.07)	.74	(7.76)		
	R^2	.49		.47		.53		.67		.74			
Bought up to	α	-0.168	(-0.68)	0.428	(1.25)	0.977	(3.30)	0.757	(3.47)	0.936	(4.24)		
30% of	$\hat{a}_m$	1.02	(0.25)	0.91	(-0.89)	0.92	(-1.71)	0.89	(-1.89)	0.83	(2.99)		
authorized	$\hat{a}_{vmg}$	0.02	(0.18)	0.03	(0.18)	0.00	(0.00)	0.02	(0.17)	-.14	(-1.37)		
program	$\hat{a}_{sml}$	0.93	(8.22)	0.69	(4.44)	0.80	(6.41)	0.72	(7.77)	.75	(8.05)		
amount	R^2	.74		.49		.63		.74		.73			
Bought more	α	-0.477	(-2.07)	0.162	(0.59)	0.136	(0.49)	0.222	(1.07)	0.573	(2.43)		
than 30% of	$\hat{a}_m$	0.77	(-3.23)	0.77	(-2.70)	0.82	(-2.38)	0.81	(3.57)	0.80	(-3.24)		
authorized	$\hat{a}_{vmg}$	-0.03	(-0.32)	0.11	(0.83)	0.04	(0.29)	0.02	(0.25)	0.09	(0.81)		
program	$\hat{a}_{sml}$	0.55	(5.12)	0.51	(4.12)	0.55	(4.74)	0.49	(5.58)	0.63	(6.31)		
amount	R^2	.63		.50		.60		.71		.66			

Table 9

Long-run Performance Conditional on Trading Activity in the Second-Half of the Repurchase Program

Firms where no more than 15% of the repurchase program was completed by the end of month 6 are sorted into two portfolios. The first group contains those firms where no shares were purchased during months 7 through 12 and are labeled "no buying". The second group contains the balance of firms which repurchased at least some stock during months 7 to 12 and are labeled "at least some buying." Portfolios are formed in calendar time for both portfolios and excess performance (in %) is measured using a three-factor model:

$$r_{p,t} - r_{f,t} = \alpha + \hat{a}_m(r_{m,t} - r_{f,t}) + \hat{a}_{vmg}(r_{value,t} - r_{growth,t}) + \hat{a}_{sml}(r_{small,t} - r_{large,t}) + \varepsilon_t$$

where $r_{p,t} - r_{f,t}$ is the excess portfolio return in month t, $(r_{m,t} - r_{f,t})$ is the monthly excess return to the TSE. In the three-factor model, $(r_{small,t} - r_{large,t})$ and $(r_{value,t} - r_{growth,t})$ are size and book-to-market factors, respectively. Both factors are derived from large-cap-value, large-cap-growth, small-cap-value and small-cap-growth style indices defined by BARRA using 500 TSE-listed firms. The value minus growth factor is calculated by taking the difference between the average small-cap-value and large-cap-value indices and the small-cap-growth and large-cap-growth indices. Likewise, the small minus large factor is calculated by differencing the average small-cap-value and small-cap-growth indices with the average large-cap-value and large-cap-growth indices. Calendar-time portfolios are constructed beginning July 1990 and ending December 1998. Months where the portfolios contained 6 or fewer stocks are ignored. *t*-statistics are provided in parentheses and test the hypothesis that the parameter value is zero, except for $\hat{a}_m$ where the hypothesis test value is 1.0.

		Year -1		Months 1-6		Months 7-12		Year 1		Years 2 to 3			
No	α	-0.687	(-2.29)		0.466	(1.42)	1.140	(2.98)	0.775	(3.12)	0.265	(1.18)	
buying	$\hat{a}_m$	1.09	(0.97)		1.11	(1.13)	0.96	(-0.44)	1.03	(0.48)	0.95	(-0.80)	
after month 6	$\hat{a}_{vmg}$	0.03	(0.17)		0.13	(0.77)	0.13	(0.74)	0.19	(1.65)	0.09	(0.89)	
	$\hat{a}_{sml}$	0.98	(7.12)		0.91	(6.17)	0.96	(5.98)	0.97	(9.24)	0.78	(8.20)	
	R^2	.68			.61		.55		.75		.75		
At least some	α	0.121	(0.43)		0.562	(1.63)	-0.090	(-0.27)	0.418	(1.73)	0.867	(3.89)	
buying	$\hat{a}_m$	0.80	(-2.28)		0.58	(-4.03)	0.74	(-3.02)	0.73	(-4.28)	0.82	(-3.08)	
after month 6	$\hat{a}_{vmg}$	-0.18	(-1.29)		-0.01	(-0.04)	-0.38	(-2.47)	-0.21	(-1.84)	-0.04	(-0.38)	
	$\hat{a}_{sml}$	0.56	(4.37)		0.45	(2.92)	0.27	(1.96)	0.36	(3.50)	0.56	(5.94)	
	R^2	.58			.30		.52		.62		.70		

Table 10
Long-run Performance of TSE-listed
Seasoned Equity Offerings and Completed Stock Acquisitions

Equal-weighted portfolios are formed in calendar time for TSE-listed firms which made either a seasoned equity offering or completed a stock (or partial stock) acquisition of another company. For acquisitions, only cases where common stock was used to finance at least one-third of the transaction are retained. Firms where the market value of the offering or acquisition was less than $10 million are excluded. The resulting sample includes 134 offerings and 27 acquisitions. Excess performance (in %) is measured using a three-factor model:

$$r_{p,t} - r_{f,t} = \alpha + \hat{a}_m(r_{m,t} - r_{f,t}) + \hat{a}_{vmg}(r_{value,t} - r_{growth,t}) + \hat{a}_{sml}(r_{small,t} - r_{large,t}) + \varepsilon_t$$

where $r_{p,t} - r_{f,t}$ is the excess portfolio return in month t, $(r_{m,t} - r_{f,t})$ is the monthly excess return to the TSE. In the three-factor model, $(r_{small,t} - r_{large,t})$ and $(r_{value,t} - r_{growth,t})$ are size and book-to-market factors, respectively. Both factors are derived from large-cap-value, large-cap-growth, small-cap-value and small-cap-growth style indices defined by BARRA using 500 TSE-listed firms. The value minus growth factor is calculated by taking the difference between the average small-cap-value and large-cap-value indices and the small-cap-growth and large-cap-growth indices. Likewise, the small minus large factor is calculated by differencing the average small-cap-value and small-cap-growth indices with the average large-cap-value and large-cap-growth indices. Calendar-time portfolios are constructed beginning July 1990 and ending December 1998. Months where the portfolios contained 6 or fewer stocks are ignored. *t*-statistics are provided in parentheses and test the hypothesis that the parameter value is zero, except for $\hat{a}_m$ where the hypothesis test value is 1.0.

		Year -1		Year 1	Year 2		Year 3		Years 1 to 2		Years 1 to 3			
SEOs	α	1.111	(1.98)		-0.661	(-1.83)	-0.386	(-1.07)	-1.075	(-2.52)	-0.352	(-1.29)	-1.088	(-3.38)
and	$\hat{a}_m$	1.38	(2.05)		0.78	(-1.85)	0.90	(-0.89)	0.98	(-0.20)	0.81	(-2.30)	.91	(-1.02)
acquiring	$\hat{a}_{vmg}$	-0.42	(-1.51)		-0.44	(-2.48)	0.12	(0.70)	0.27	(1.38)	-0.14	(-1.05)	0.25	(1.67)
firms	$\hat{a}_{sml}$	0.50	(2.00)		0.35	(2.10)	0.20	(1.19)	0.48	(2.68)	0.20	(1.63)	0.53	(3.88)
together	R^2	.51			.46		.43		.53		.55		.54	
SEOs	α	1.469	(2.58)		-0.981	(-2.51)	-0.798	(-1.25)	-1.897	(-3.38)	-1.131	(-2.11)	-1.887	(-3.70)
only	$\hat{a}_m$	1.36	(1.89)		0.78	(-1.56)	0.95	(-0.27)	1.07	(0.50)	0.93	(-0.44)	0.98	(-0.15)
	$\hat{a}_{vmg}$	-0.54	(-1.90)		-0.45	(-2.09)	-0.02	(-0.08)	0.57	(2.11)	-0.14	(-0.52)	0.25	(1.01)
	$\hat{a}_{sml}$	0.56	(2.22)		0.24	(1.11)	0.13	(0.45)	0.47	(1.85)	0.22	(0.89)	0.50	(2.30)
	R^2	.51			.45		.25		.41		.28		.35	
Acquiring	α	0.439	(0.71)		-0.385	(-0.62)	-0.644	(-1.26)	-0.011	(-0.02)	-0.395	(-0.94)	-0.347	(-1.11)
firms	$\hat{a}_m$	1.02	(0.09)		0.66	(-0.34)	0.81	(-1.21)	0.78	(-1.46)	0.72	(-2.12)	0.72	(-3.42)
only	$\hat{a}_{vmg}$	-0.37	(-1.04)		-0.42	(-1.40)	0.28	(1.11)	0.05	(0.16)	0.00	(0.00)	0.08	(0.54)
	$\hat{a}_{sml}$	0.23	(0.70)		0.57	(2.02)	0.42	(1.76)	0.29	(1.09)	0.46	(2.40)	0.43	(2.98)
	R^2	.38			.22		.23		.24		.27		.47	