ESSAYS ON TSE SHARES CROSS-LISTED IN U.S. TRADE VENUES

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ABSTRACT

ESSAYS ON TSE SHARES CROSS-LISTED IN U.S. TRADE VENUES

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The thesis consists of three essays. The first essay examines whether an international trade venue clientele effect exists for Canadian shares cross-listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and National Association of Securities Dealers Automated Quotation System (NASDAQ). The main hypothesis states that for trades of Canadian cross-listed shares on the Toronto Stock Exchange (TSE) and U.S. stock markets, assets with increasing (decreasing) trade costs as measured by the relative effective half-spreads across trade venues are held in portfolios with the same or expected increasing (decreasing) relative investors' holding periods. The results support this hypothesis for the Canadian cross-listed shares whose trades are executed on the TSE and each U.S. trade venue. The findings suggests that the TSE has consistently lost its share of executed order flow relative to the U.S. primary trade venues, and that this loss is associated with increased relative trade costs on the TSE.

The second essay analyzes the determinants of the price impact at the announcement and issue dates for domestic and international seasoned equity offerings (SEOs) for Canadian shares cross-listed on the NYSE/AMEX or NASDAQ. In addition, it analyzes whether the determinants for domestic and international SEOs are the same for shares cross-listed on the NYSE/AMEX and NASDAQ, respectively. The findings indicate that the determinants of the market reaction at the announcement and issue dates for the SEOs of the Canadian cross-listed shares differ for all the studied samples and are unambiguously dependent on the SEO geographic placement and cross-listing U.S. trade venue.

Finally, the third essay investigates whether the determinants of underwriter fees are the same for domestic and non-domestic SEOs by Canadian firms cross-listed on the NYSE/AMEX or

NASDAQ. The results clearly indicate that the determinants of underwriting fees differ for the domestic and non-domestic SEOs. After controlling for differences in other relevant fee determinants, the underwriter fees for non-domestic SEOs are significantly higher for the Canadian shares cross-listed on the NASDAQ compared to those cross-listed on the NYSE/AMEX.

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CHAPTER 1

INTRODUCTION

The vast majority of theoretical and empirical work in the finance literature is based mainly within the institutional framework for the operations of U.S. firms and their prevailing trading mechanisms, such as the New York Stock Exchange (NYSE), National Association of Securities Dealers Automated Quotation System (NASDAQ), American Stock Exchange (AMEX) and the regional exchanges. Seminal published work, such as the capital structure irrelevance theory by Miller and Modigliani (1958), the Capital Asset Pricing Model of Sharpe (1998), the Black and Scholes (1973) option pricing model and the Arbitrage Pricing Theory of Ross (1976), among others, are models whose tests using U.S. data set the benchmark for testing the universality of their applications. These models have established the paradigm against which most current financial literature are judged.

Conducting empirical tests primarily for American firms and markets, the rejection or support for such models may be fragile due to possible data mining. Furthermore, many of the financial anomalies and irregularities reported in the extant literature do not have clear explanations for American firms traded on the U.S. stock markets. These observations may also be attributable to incorrect model specifications or test methodologies (Durham, 2001).

To address the problem of data mining, market anomalies or incorrect model specification, recent theoretical and empirical work in finance is being undertaken with a richer data set that includes non-U.S. companies, which have special firm characteristics and often operate under different institutional frameworks. For these settings, many of the theoretical and empirical results often differ from those found for American firms traded on the U.S. stock markets. For example, some of the so-called anomalies that prevail on the U.S. markets do not manifest themselves in other world markets.[1] Additionally, the literature on the trading behavior of non-U.S. companies that trade on the U.S. stock market is growing.[2] A comparison of the results obtained in these studies with those already existing for U.S. companies should contribute to the validation or the rejection of existing paradigms in such a way that our understanding of the finance field is enhanced (Khun, 1970).

The main purpose of this thesis is to extend the existent empirical literature on non-U.S. firms by analyzing three primary aspects of Canadian shares that are cross-listed in the Toronto Stock Exchange (TSE) and in major U.S. trade venues, such as the NYSE, AMEX and NASDAQ. We first present a brief discussion of each of these aspects, which is followed by a more detailed discussion of these three primary aspects. In CHAPTER 2, the analysis of holding period differences for Canadian shares cross-listed on the TSE and in U.S. trade venues provides valuable insights on the trading dynamics and the impact that public information events may have for Canadian shares cross-listed in both domestic and at least one international market. In CHAPTER 3, this dissertation examines whether the determinants of the market reaction of firm-specific events, such as the announcement of domestic and international seasoned equity offerings, differs for the shares traded on the TSE and that are cross-listed in the NYSE, AMEX and NASDAQ. In CHAPTER 4, this dissertation examines whether or not the determinants of the investment banking fees for SEO placements differ by geographic location of their placement for Canadian SEOs for the shares cross-listed on the TSE and on the NYSE/AMEX and NASDAQ.

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[1] For example, Domowitz, Glen, and Madhavan (1997) develop a model that explains why prices are different for the same shares, which only differ in ownership restriction for the Mexican stock market. Kang and Stulz (1995) report that no home bias appears to exist in Japan. Kang and Stulz (1996) report a positive market reaction to convertible debt issues in Japan, which differs from the negative market reaction found on the U.S. Kryzanowski and Zhang (1992) find that longer-term contrarian investment strategies are not profitable in Canada markets, which differs from the results of similar studies for U.S. markets. Bhattacharya, Daouk, Jorgenson, and Kehr (2000) report no market reaction to company events in Mexico. Slovin, Sushka, and Lai (2000) find differential effects on firm value for the choice of equity flotation method for the U.S. and the U.K.

[2] For some studies that deal with non-U.S. companies that cross-list on the U.S., see Karolyi (1998), Foerster and Karolyi (1998, 1999 and 2000). For a comparison of U.S. and non-U.S. firms, see Bacidore and Sofianos (2002).

We now present our more fuller description of each of these three chapters. Thus, in chapter 2, we extend the work by Amihud and Mendelson (1986) and Atkins and Dyl (1997a) that, in equilibrium, assets with higher spreads are held in portfolios with the same or expected longer holding periods. We examine whether an international trade-venue clientele effect exists for Canadian shares cross-listed on the TSE and the U.S. markets. We test whether or not investors have the same holding periods for the Canadian cross-listed share trades executed on the U.S. trade venues relative to the same-firm share trades executed on the TSE, and whether or not any differences are associated with the size of their relative effective half-spreads.

In chapter 2, we also analyze the impact of TSE decimalization on order flow execution and trade-venue clientele behavior. Ahn, Cao, and Choe (1998), and Chung, Kryzanowski and Zhang (1996), among others, find that TSE decimalization did not have a significant impact on the trading volumes on the TSE. Their results are based on an analysis of the trade behavior of a sample of firms around the time of this event. Since one of the objectives of the TSE decimalization was to increase its trading volume, this chapter re-examines this event using a different test methodology for the Canadian cross-listed shares traded on the TSE, and separately for the same shares traded on the NYSE/AMEX and NASDAQ. The tests are conducted using a longer time period than those previously reported in the literature.

The controversial and unresolved issue of whether proportional effective spreads *cause* trading volume, or vice-versa, is addressed in this chapter by using Granger causality tests. Finally, a cross-sectional empirical model is estimated to determine whether there are any systematic determinants of share turnover for the Canadian cross-listed shares traded on the TSE and U.S. trade venues in the spirit of Lo and Wang (2000).

Chapter 3 examines the determinants of the price impact at the announcement and issue dates for the domestic and international primary and secondary seasoned equity offerings (SEOs) for Canadian shares cross-listed on the TSE and on the NYSE/AMEX or NASDAQ. Foerster and Karolyi (1999) find that the non-U.S. companies that list and issue equity on the U.S. have more favorable abnormal returns post-listing relative to similar firms that do not raise capital. They find that their results are contrary to findings in the IPO/SEO empirical literature that negative abnormal returns usually occur post-listing. However, they do not find any significant difference in abnormal returns for the two types of firms around the listing date for the same companies. In contrast, Affleck-Graves, Hedge, and Miller (1994) argue that the trading mechanism where shares are traded has a significant impact on trading behavior. Chapter three attempts to resolve these conflicting findings by analyzing whether the determinants of abnormal returns at the announcement (issue) date are the same for domestic and international SEOs, and also separately for the domestic and international SEOs for shares cross-listed on the TSE and on the NYSE/AMEX and NASDAQ.

Another controversial issue that remains unresolved is whether the shares have downward sloping demand or whether any price impact is solely due to firm-specific information effects. Thus, evidence is reported in chapter 3 on whether or not the price impact from SEOs supports firm-information asymmetry or market-information (finite price elasticity of demand) models. Existing studies that use firm-information asymmetry models include Myers and Majluf (1984), Jensen (1986), Viswanath (1993), Mikkelson and Partch (1986), Asquith and Mullins (1986), and Bayles and Chaplinski (1996), among others. Studies that use market-information (or finite price elasticity of demand) models include Allen and Postlewaite (1984), Bagwell (1991), Loderer, Cooney, and Van Drunnen (1991a), Chaplinski and Ramchand (2000), among others.

Chapter 4 presents evidence of whether the determinants of underwriter fees (the gross spreads of investment bankers) are the same for domestic and non-domestic SEOs by Canadian shares cross-listed on the TSE and on the NYSE/AMEX and NASDAQ. Current theoretical and empirical models identify no common determinants of underwriting fees.[3] Since these studies use different methodologies, sample sizes, and types of offerings, it is difficult to make reliable comparisons among them. Finding the expected determinants of underwriter fees is important

[3] For a brief survey, see Bühner and Kaserer (2000).

because it represents a non-trivial cost for raising primary and secondary equity, which for the sample examined herein is in the mean range of 3.8 to 5.82 percent of the total proceeds. This issue is addressed in this chapter by using a sample of domestic and non-domestic SEOs by Canadian firms cross-listed on the U.S. markets. By using SEOs for firms with cross-listed shares, the results become more comparable, and therefore more reliable. The reason for this is that the firms that float shares domestically are usually the same ones that float shares overseas, albeit on different dates. Thus, no problem of inadequate comparison of results for domestic and non-domestic SEOs occurs by using Canadian cross-listed shares since they have same underlying firm risk.

The expected determinants analyzed in chapter 4 include determinants that have been identified in the theoretical and empirical literature, such as natural logarithm of the monetary offering size as a proxy for economies of scale, firm size as proxied by market capitalization, relative offering size (offering size divided by the number of shares outstanding) as a proxy of variable cost, the standard deviation of returns as a proxy for price risk, syndicate size as a proxy for underwriter effort, number of equity offerings as a proxy for underwriter prestige, whether the seasoned offering has an overallotment option or not, whether the issue is a primary or secondary offering, and whether the issue is for an issuer who shares are cross-listed on the NYSE/AMEX or NASDAQ.

Finally, some concluding remarks and directions for future research are presented in chapter 5.

CHAPTER 2

IS THERE AN INTERNATIONAL TRADE-VENUE CLIENTELE EFFECT FOR CANADIAN SHARES CROSS-LISTED ON THE UNITED STATES?

2.1 INTRODUCTION

Amihud and Mendelson (1986) theoretically demonstrate that shares with higher bid-ask spreads are held for longer periods than shares with smaller spreads. Atkins and Dyl (1997a) find that holding periods are positively associated with the size of the quoted bid-ask spread for NASDAQ and NYSE stocks. Merton (1987) demonstrates the importance of an increased shareholder base in enhancing investor recognition of firms. Kadlec and McConnell (1994) find that domestic inter-listings from NASDAQ to the NYSE enhance investor recognition and increase share liquidity, which is consistent with the Merton hypothesis. All these studies examine holding period and trade behaviors for stocks listed in the domestic U.S. stock market.

For internationally cross-listed shares, the empirical evidence on whether investor recognition and increased liquidity simultaneously occur is mixed. Baker (1996) claims that non-U.S. firms usually cross-list to increase their investor base even if it lowers the liquidity of their shares.[4] Baker, Nofsinger, and Weaver (2002) report that the main motive for non-domestic companies to cross-list in the LSE and the NYSE is enhanced firm visibility through increased investor following and media coverage of the firm. For the post cross-listing time period, Foerster and Karolyi (1998) find that some firms experience decreases in their domestic bid-ask spreads and trading volumes ('losers') while others exhibit no significant changes in both of these microstructure variables ('winners'). This is consistent with the Chowdhry and Nanda (1991) model. Foerster and Karolyi (1999) find that international cross-listing enhances investor

[4] Other benefits include the need to tap global financing at a lower cost, to establish a secondary market for shares to acquire other firms on the U.S. market, and to create a secondary market for shares that can be used to compensate local management and employees in foreign subsidiaries. For a relatively complete list of the advantages of cross-listing overseas, see Saudagaran and Biddle (1995) and Mittoo (1992b) for a survey of Canadian firms.

recognition without improving liquidity. Doukas and Switzer (2000) find positive abnormal returns for Canadian firms that cross-list on major U.S. exchanges. They find that the abnormal returns are associated with increased investor recognition, which is reflected in increased trading volume on both markets. They also note that some Canadian companies choose to list only on the U.S. major exchanges such as the AMEX or NASDAQ to enhance their visibility compared to listing on the TSE. Errunza and Miller (2000) find that a company usually cross-lists its shares internationally in order to increase its investor base (investor recognition) and the liquidity of its shares. Doidge, Karolyi, and Stulz (2001) find that firms that cross-list in major U.S. markets are more highly valued than similar firms that do not cross-list. They attribute this to their higher growth opportunities and lower costs of controlling shareholder agency problems. This also is consistent with the Merton (1987) model since a lower cost of controlling shareholder agency problems implies higher firm disclosure and less information asymmetry.

In contrast, Howe and Lin (1992) and Chang, Seow, and Wong (1996) find that the shares listed by non-U.S. companies on the U.S. (i.e., American depositary receipts or ADRs) have higher liquidity as measured by smaller bid-ask spreads than that of the underlying shares that trade on home markets. However, unlike the case for U.S. ADRs, Ahn et al. (1998) find that trades of cross-listed shares executed on the TSE have smaller bid-ask spreads and higher trading volumes than same-firm trades executed in the major U.S. trade venues. Kryzanowski and Zhang (2002) find that superior trade price execution performance of the TSE for Canadian share trades executed on the TSE relative to the same firm share trades executed on the U.S. trade venues occurs before the TSE decimalization and becomes inferior afterwards, except for share trades executed on the NASDAQ in which the TSE advantage remains but is narrower.

One possible explanation for these differences between ADRs and TSE-listed shares cross-listed in U.S. trade venues is that Canadian companies that list their shares in U.S. markets have a more developed and liquid domestic market than do the firms that list ADRs. These ADR-listing firms are more likely to find a large pool of international (U.S.) investors who are more informed, and therefore are more willing to trade ADRs relative to the underlying shares in the issuers' home markets. In contrast, the Canadian stock market is already quite liquid (e.g., high market share turnover) and competitive in terms of trade costs relative to the major U.S. trade venues. Thus, Canadian firms that list on the U.S. trade venues usually want to improve their visibility in order to increase their investor base and liquidity. A likely outcome of such cross-listing is lower trade costs (bid-ask spreads), and thereby enhanced share liquidity.

While cross-listing may enhance liquidity, it also may increase market competition for order flow for the same-firm cross-listed shares across trade venues. The trade behavior of cross-listed shares executed in the domestic stock market may influence the size of trade costs and/or the relative share of transacted order flow (average investor holding period) in the rival international trade venue, and vice-versa. Thus, the Amihud and Mendelson proposition can be generalized for internationally cross-listed shares in integrated markets to produce an *international trade-venue clientele effect*. In equilibrium, assets with increasing (decreasing) *relative* spreads across trade venues are held in portfolios with the same or expected increasing (decreasing) *relative* holding periods. Thus, a decrease in relative trade costs as measured by the effective spread in favor of the U.S. versus the TSE trade venue will result in a decrease in relative holding periods (increase in relative volume turnovers) on the U.S. trade venue relative to that on the TSE for the same-firm shares.

The existence of an international trade-venue clientele effect implies a win-lose situation for order flow execution shares across trade venues. A smaller ratio of the holding periods between the U.S. trade venue and the TSE for the same-firm cross-listed shares implies that trading volume (share turnover) has increased on the U.S. trade venue relative to that on the TSE. In turn, this change normally is associated with a higher decrease (or lower increase) in effective spreads on the U.S. trade venue relative to the lower decrease (or higher increase) in effective spreads on the TSE. If the synchronized increase (decrease) in the ratio of holding periods for the shares cross-listed on the U.S. trade venue and the TSE is associated with a synchronized increase (decrease) in effective spreads for the same-firm shares on the U.S. trade venue and the TSE, no international trade-venue clientele effect occurs. This would suggest that markets are becoming highly competitive, and that the differentials in trade costs and holding periods across trade venues would tend to disappear. In turn, this would lead to the full integration of the Canadian and U.S. stock markets. [5]

Damodaran and Subrahmanyam (1992) and Coughenour and Shastri (1999) review various studies, which find that option trading decreases information asymmetry and enhances market efficiency for the underlying shares. This is reflected in a decrease in market volatility, an increase in the market liquidity of the underlying shares through a decrease in the bid-ask spread, and an increase in trading volume and market depth. Thus, internationally cross-listed shares with options traded on them should have lower bid-ask spreads and shorter holding periods than their counterparts without options traded on them, everything else held constant.

The primary objective of this chapter is to test whether or not an international trade-venue clientele effect exists for Canadian firms cross-listed on the TSE and on either of the three major U.S. listing venues. As such, this study is the first to use international (Canadian) cross-listed shares to test whether or not an 'international trade-venue clientele' effect exists for the same-firm shares with(out) options traded on them across international trade venues using effective spreads and holding periods. The study also examines the impact of the TSE decimalization on order flow execution and trade-venue clientele behavior. The objective of the TSE decimalization, which occurred on April 15, 1996, was to decrease the minimum share price increments (tick size) in order to increase TSE trading volumes. An empirical cross-sectional model is estimated to identify the determinants of holding periods and share turnover separately and jointly across trade venues. The sample is separated by various trade venues to test the robustness of results.

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[5] Important studies on stock market integration between Canada and the U.S. include Jorion and Schwartz (1986), Mittoo (1992a) and Koutulas and Kryzanowski (1994).

Our empirical findings support the trade-venue clientele hypothesis of international listing. The first major finding is that the ratio of effective spreads for international trade venue pairings is positively associated with the ratio of their corresponding holding periods for the share trades executed in the AMEX, NYSE with(out) options traded on them and the NASDAQ, and for the same-firm share trades executed on the TSE, primarily after the TSE decimalization that intensified the inter-venue competition for order flow execution. The second major finding is that the Amihud and Mendelson proposition does not hold systematically for each trade venue for the cross-listed shares. Specifically, the relationship between holding periods and effective spreads does not hold during the pre-decimalization period for the Canadian shares cross-listed on the NYSE with(out) options traded on them for trades executed on the TSE. During the post-decimalization period, the same relationship does not hold for the Canadian cross-listed share trades executed in the AMEX and the NYSE with options traded on them. The third major finding is that, for most time lags considered, the ratio of holding periods Granger causes the ratio of effective spreads for the TSE shares cross-listed in the AMEX, NYSE with(out) options traded on them and NASDAQ. This supports that TSE decimalization, whose objective was to reduce the bid-ask spread, was a reaction to the TSE's decreasing share of the executed order flow for cross-listed shares. The decrease in relative executed order flow was also assisted by the minimum quotation increment reductions (MQIRs) implemented by the AMEX, NYSE and NASDAQ after the TSE MQIR. However, these events did not consistently have the desired effect of decreasing trade costs for the cross-listed shares across trade venues, since effective spreads on average increased for the cross-listed shares in the AMEX and the NASDAQ. The final major finding is that no systematic determinants of turnover volume are identified for the cross-listed share trades executed on the TSE and the same-firm share trades executed on the AMEX, NYSE with(out) options traded on them, or the NASDAQ. This finding holds for share trades executed on the TSE, for same-firm share trades executed on the U.S. trade venues, and for share trades when both markets are considered jointly.

The remainder of this chapter is organized as follows. The hypothesis to be tested is presented in the next section. The sample and the data are described in section 2.3. The general test methodology is introduced in section 2.4. The empirical results are reported and analyzed in section 2.5. Section 2.6 concludes the chapter.

2.2 HYPOTHESIS

The following hypothesis is tested to determine whether or not an international trade venue clientele effect exists for Canadian shares cross-listed on the TSE and U.S. trade venues:

> For trades of Canadian cross-listed shares of the same firm in integrated capital markets, increases (decreases) in the ratio of the effective spreads for share trades executed on the TSE relative to those executed in U.S. trade venues are positively associated with their corresponding ratio of holding periods, all else equal.

This hypothesis implies that an increasing (decreasing) holding period ratio for the cross-listed shares of the same-firm share trades executed on the TSE relative to those executed on the U.S. trade venues is positively associated with an increasing (decreasing) ratio of their corresponding effective spreads. To illustrate, an increasing (decreasing) ratio of the holding periods between two trade venues occurs if the holding period for the share trades executed on the TSE increases (decreases) faster than that for the U.S. trade venue.[6] In turn, the ratio of the share turnover on the TSE relative to those on the competing U.S. trade venue decreases (increases) with an increase (decrease) in the ratio of their respective holding periods. The TSE (U.S. trade venue) loses (wins) in terms of decreasing (increasing) relative share turnover (liquidity). This relative decrease (increase) in share turnover for the TSE is associated with a higher ratio

[6] Other possible combinations include that the holding period decreases proportionally less on the U.S. trade venue relative to the TSE; and that the holding period for the share trades executed on the U.S. trade venue increase while the holding period for the same-firm share trades executed on the TSE decrease. The same combinations can occur for the effective spreads.

between the effective spreads for the share trades executed on the TSE relative to that of U.S. trade venue. Thus, whether a particular trade venue wins or loses in terms of liquidity (share turnover) or trade costs depends on the direction and relative magnitude of the changes in their respective ratios.

This hypothesis is based on a number of theoretical models. The clientele model of Amihud and Mendelson (1986) states that higher bid-ask spreads are associated with longer holding periods. The Merton (1987) investor recognition model implies that cross-listing may reduce information asymmetry by increasing the investor base and thereby enhancing liquidity by increasing share turnover and decreasing trade costs. The inter-market competition model of Chowdhry and Nanda (1991) states that by attracting more firms (issuers) and investors, more liquid markets originate inter-market competition for order flow among suppliers of immediacy. Atkins and Dyl (1997a) report evidence supporting the Amihud and Mendelson hypothesis for shares traded in the NYSE and NASDAQ.

2.3 SAMPLE AND DATA

The sample consists of 117 TSE firms of which 22 firms are cross-listed on the AMEX (all without options traded on them), 50 firms are cross-listed on the NYSE (21 with options traded on them), and 45 firms are cross-listed on the NASDAQ (two with options traded on them). The sample includes Canadian firms that listed on the TSE and on U.S. major exchanges before and/or after January 1, 1994. The time period examined is from January 4, 1994 to December 31, 1998. This time period provides a sufficient number of monthly observations to analyze changes in the behavior of the effective spreads and holding periods during the pre- and post-TSE-decimalization periods. Daily trade information for the TSE (AMEX, NYSE and NASDAQ) is obtained from the TSE Western (Trade and Quote) Database.[7]

[7] Foreign issuers are not reported in the CRSP database.

Based on a careful inspection of the data for NASDAQ in the Trade and Quote (TAQ) database, various minimum trading volumes of 100's are found (which is the minimum trade size allowed). This indicates that volume is already adjusted for double counting.[8] The numbers of shares outstanding, which are assumed to be available for trading on the three U.S. listing venues studied herein, are also obtained from the TSE Western database. This assumption is based on the argument by Kryzanowski and Zhang (2002) that investors should have no major technical difficulties in trading any amount of cross-listed shares on the TSE or the three major U.S trade venues. Monthly averages of daily transactions are used. Monthly averaging helps to reduce the 'noise' that is pervasive in daily data and provides more efficient coefficient estimates by substantially reducing the high autocorrelation present in daily data. This occurs particularly on the NASDAQ, in which many cross-listed shares have trading days with no trades.

The matching of the daily trades of cross-listed shares on the TSE and the AMEX, NYSE and NASDAQ considers only the calendar days when both the TSE and the U.S. listing venues simultaneously are open for trading. The sample includes only those stocks that have at least one transaction in a given month. If no trade occurs in a given month for a specific stock, the period prior to the last discontinuity is eliminated and only the sample period where no discontinuities occur up to the end of the sample period are considered. If for any reason a price is missing on a given day for which traded volume is reported, this error is corrected by using the quote mid-spread as a proxy for the missing price.

2.4 METHODOLOGY

The first test examines whether or not the Amihud and Mendelson (1986) relationship between effective spreads and holding periods holds for the Canadian share trades executed on the TSE and for the same-firm share trades executed on U.S. trade venues grouped by listing

[8] Atkins and Dyl (1997b) document that on the NASDAQ National Market System trading volume is double-counted.

venue. The methodology for testing this relationship is a modified version of the Atkins and Dyl (1997a) empirical model. Unlike Atkins and Dyl, the modified model uses effective instead of quoted spreads,[9] includes the mid-spread,[10] and accounts for whether or not shares have options traded on them.

The model that investigates the relationship between holding periods and effective spreads is stated as follows:

$$HP_{iT} = b_0 + b_1 ES_{iT} + b_2 MV_{iT} + b_3 VAR_{iT} + b_4 MS_{iT} + \varepsilon_{iT} \qquad (2\text{-}1)$$

HP_{iT} is the holding period in years of the average investor for firm i during month T. It is obtained by dividing the number of shares outstanding by the annualized daily trading volume for firm i. The average holding period for the common stock of firm i is calculated as HP_{iT} = [Number of Shares Outstanding /Annualized Daily Trading Volume]. As noted by Atkins and Dyl, this measure of holding period is approximate. We do not have information on the share float nor the number of investors and their individual trading volumes executed in either the TSE or U.S. trade venues to determine more accurately how long an investor in each trading venue holds the shares of the same underlying firm. Having this information would undoubtedly provide a more reliable measure of the average investor's holding period. However, since the objective is to evaluate holding periods for the shares cross-listed across trade venues for the same firm, our measure (although somewhat noisy) provides a meaningful comparative indicator if, as we assume, the same number of shares are available for trade across trade venues. Also, it is reasonable to assume that trading per-capita is higher in the market with lower trade costs. Therefore, HP_{iT} is a fairly plausible measure of an average investor's holding period when

[9] Effective spreads are a better proxy for actual trade costs (than quoted spreads) since some investor trades are inside the spread (Petersen and Fialkowski, 1994; Huang and Stoll, 1996; and Eleswarapu, 1996).
[10] Kryzanowski and Zhang (2002) find that the mid-spread is an important variable in explaining the difference in trade costs between the shares cross-listed on the TSE and the same-firm share trades executed in various U.S. trade venues.

considering longer horizons and their relationship with liquidity costs. An advantage of using this measure of holding period is that its reciprocal serves as a better proxy for trading volume relative to other proxies (see Lo and Wang, 2000).

ES_{iT} is the daily proportional effective half-spread for firm i. It corresponds to the monthly average of the daily liquidity premium (percent) or the actual cost for shares traded. It is obtained as the monthly average of the daily absolute value of the difference of the closing price and the closing average bid-ask spread, divided by the closing price. Thus, the daily proportional effective half-spread for firm i for day k, ES_{ik}, is equal to $|P_k - MS_k|/P_k$ where P_k is the closing transaction price on day k, and MS_k is the closing mid-spread. The mid-spread corresponds to the ask quote plus the bid quote, divided by two (i.e., mid-spread = [ask + bid]/2). The monthly average of the daily market capitalization of firm i's shares is MV_{iT}. It is obtained by multiplying the shares outstanding by the daily closing price. VAR_{iT} is the daily return variability of the quote mid-spread. It is equal to the monthly average of the daily variances of the mid-spread returns of firm i's stock for a period of up to one year updated to the previous day. The use of mid-spread returns in the calculation of the variance avoids volatility noise due to the bid-ask bounce. The inclusion of the mid-spread (MS_k) follows the Kryzanowski and Zhang (2002) decomposition of trade price/cost differences between trade venues as consisting of a mid-spread differential and an effective spread differential.

The sign of the estimated coefficient of ES_{iT} is expected to be positive because higher spreads imply higher transaction costs that in turn are expected to encourage investors to hold the stock longer (trading less). The estimated coefficient of MV_{iT} is expected to be positive since large firms are well known, mature, stable, low risk, with low volatility in cash flows and have a long listing history. The sign for the coefficient of VAR_{iT} is expected to be negative since higher volatility normally implies heterogeneity in trader beliefs that may encourage share trading and therefore shorter holding periods. Also it may be attributable to private information (Stoll and

Whaley, 1990; Chalmers and Kadlec, 1998). The sign of the mid-spread is expected to be negative, based on the direct relationship of mid-spread with price, which normally is negatively correlated with effective spreads. That is, higher mid-spreads may be associated with lower effective spreads, which may induce higher trading volumes, and therefore lower holding periods.

The relationship between holding periods and the effective proportional bid-ask spread is expected to be statistically different after the TSE decimalization. The reason is that TSE decimalization reduced bid-ask spreads (quoted and effective) for share trades executed on the TSE in the immediate weeks after (see Ahn et al., 1998; Chung et al., 1996; Bacidore, 1997; and McKinnon and Nemiroff, 1999). Most of these studies normally examine sample time periods within three months before/after the occurrence of TSE decimalization..

Equation (2-1) is used to estimate the coefficients for the overall sample period. However, since holding periods and bid-ask spreads are likely to be simultaneously determined, the instrumental variables used by Atkins and Dyl (1997a) in addition to the mid-spread are used to estimate the ES_{iT} in (1) using Seemingly Unrelated Regressions (SUR). Specifically:

$$ES_{iT} = c_0 + c_1 ES_{iT-1} + c_2 MV_{iT} + c_3 VAR_{iT} + c_4 MS_{iT} + \varepsilon_{iT} \qquad (2\text{-}2)$$

where all the variables are as defined above. The market value of the firm, the variance of the firm's daily returns (as proxied by the variance of the mid-spread returns) and the mid-spread are used in these regressions as control variables.

To test whether or not an international trade-venue clientele effect exists in the data, we test for the difference between holding periods after accounting for differences on effective spreads and other determinants for Canadian cross-listed share trades executed on the U.S. trade venues and the same-firm share trades executed on the TSE. The following SUR model is used for this purpose:

$$HP1_{iT} - HP_{iT} = b_0 + b_1(ES1_{iT} - ES_{iT}) + b_2(VAR1_{iT} - VAR_{iT}) + b_3(MS1_{iT} - MS_{iT}) + B_4(ES1_{iT} - ES_{iT})\,D1 + B_5(VAR1_{iT} - VAR_{iT})D1 + b_6(MS1_{iT} - MS_{iT}) + \varepsilon_{iT} \quad (2\text{-}3)$$

$HP1_{iT}$, (HP_{iT}), $ES1_{iT}$ (ES_{iT}), $VAR1_{iT}$ (VAR_{iT}) and $MS1_{iT}$ (MS_{iT}) are the holding period, effective half-spread, variance of mid-spread returns and mid-spreads for the share trades executed on the U.S. trade venues (TSE), and all the other variables are defined as before. Since the variables are in natural logarithms, the differences actually correspond to the natural log of the ratios, e.g., ln (ES1/ES). If the estimated coefficient for the difference of logs (logs of ratio) in effective half-spreads is positive and significant, then this implies that an increase (decrease) in the ratio of holding periods reflects a relative increase (decrease) in holding periods for the share trades executed in the U.S and the same-firm share trades executed on the TSE, and that this is associated with a relative increase (decrease) in the ratio of their respective effective half-spreads. Equation (2-3) is a more relevant model to determine whether the Amihud and Mendelson relationship between holding periods and effective half-spreads occurs in an international cross-listed share context than examining this relationship for each trade venue separately. The reason is that an event that may affect the trading behavior of the cross-listed shares in one trade venue is also likely to affect the trading behavior of the same-firm share trades executed on another trade venue, although not necessarily by the same magnitude or in the same direction.

Statistical significance is measured throughout at the 0.05 level. If an estimate or statistic is not significant at the 0.05 level but is significant at the 0.10 level, it is referred to as marginally significant.

2.5 EMPIRICAL RESULTS FOR HOLDING PERIODS, EFFECTIVE HALF-SPREADS AND EXECUTED ORDER FLOW SHARES FOR VARIOUS TRADE VENUES

2.5.1 Descriptive Statistics for Individual Trade Venues

Summary statistics (means, medians and standard deviations) for the proportional effective bid-ask half-spreads, holding periods, market values, variances of mid-spread returns and mid-spreads for trades executed on the TSE for shares that are cross-listed on the AMEX, NYSE with(out) options traded on them and NASDAQ are reported in panels A, B, C and D of Table 2-1, respectively.

[Please place Table 2-1 about here]

Based on panel A of Table 2-1, the daily average proportional effective half-spread and holding period are 0.792 percent and 7.01 years, respectively, for trades executed on the TSE for shares cross-listed on the AMEX over the entire time period examined herein. Their corresponding average market value, average daily variance of mid-point returns and mid-spread are 1.59 billion Canadian dollars, 0.086 percent and $18.47, respectively.

Based on panels B and C of Table 2-1 for shares cross-listed in the NYSE, the average effective spread for the shares without options traded on them (Panel C) is approximately 75% higher than for the shares with options traded on them (Panel B). Since the average holding period for the shares without options traded on them is approximately 20% shorter, this suggests that investors hold the shares with options traded on them for longer periods relative to those shares with no options traded on them. A possible reason is that investors who trade shares with options traded on them may be long-term oriented (non-informed), and may trade for diversification purposes. Although the effective spreads are smaller for the shares with options traded on them, short-term (informed) investors would prefer to trade in the options markets where they can obtain lower trade costs and more leverage, avoid short sale restrictions, and profit more cheaply from their private information (Coughenour and Shastri, 1999).

For the entire time period examined herein, the average market value, return variability and mid-spread for the shares with (without) options traded on them is 6.9 (2.2) billion Canadian dollars, 0.066 (0.071) percent, and $38.30 ($20.05) Canadian dollars, respectively. This indicates that, on average, firms with options traded on them are larger with marginally lower return variances and higher mid-spreads relative to those without options traded on them. This result may not be inconsistent with the studies that find that lower bid-ask spreads are associated with lower stock return variances (Bessembinder, 1998; Jones and Seguin, 1997), and that variances are lower for larger firms (Stoll and Whaley, 1983; Lakonishok and Shapiro, 1986). The reason is that the variance of mid-spread returns examined herein is less likely to be affected by the bid and ask spread bounce than variance based on stock price returns.

For trades executed on the TSE for shares cross-listed on NASDAQ, the average effective half-spread is 1.146 percent, the average holding period is 6.36 years, the average market capitalization is 429 million Canadian dollars, the average market variance is 0.142 percent, and the average mid-spread is $11.65 Canadian dollars, respectively. The average effective half-spreads are higher for the TSE shares cross-listed on the NASDAQ relative to those cross-listed on AMEX or NYSE with or without options traded on them. The NYSE listed shares with options traded on them have the lowest average effective half-spreads. A possible reason could be that TSE shares cross-listed on NASDAQ carry a lower price (mid-spread) on average than those cross-listed in AMEX and NYSE so that their relative half-spreads are proportionally higher.

Corresponding summary statistics for the TSE cross-listed share trades executed on the U.S. trade venues, grouped by U.S. listing venue, are reported in Table 2-2. The presentation of these results mimic those in Table 2-1 on that the AMEX, NYSE with(out) options traded on them, and NASDAQ results are reported in panels A, B, C and D, respectively, of Table 2-2.

[Please place Table 2-2 about here]

Based on the results reported in panel A of Table 2-2 for trades executed on the AMEX, the mean effective half-spread increases from 0.548 to 0.792 percent and the mean (median) holding period *decreases* from 50.13 (47.32) to 42.19 (39.29) years post-TSE-decimalization. Based on the results reported in panel B of Table 2-2 for trades executed in the NYSE for TSE cross-listed shares with options traded on them, the average mean effective half-spread decreases significantly from 0.326 to 0.227 percent, and the mean holding period *increases* marginally from 9.45 to 10.2 years post-TSE-decimalization. Based on the results reported in panel C of Table 2-2 for trades executed on the NYSE for TSE cross-listed shares with no options traded on them, the mean effective half-spread decreases significantly from 0.646 to 0.488 percent, and the mean (median) holding period *increases* from 18.48 (8.59) to 38.41(37.54) years post-TSE-decimalization. This result is similar to that obtained by Ahn et al. (1996) who find that the tick size reduction from $1/8 to $1/16 for stocks priced between $1 and $5 on the AMEX on 2 September 1992 reduced effective spreads. Also, Ahn et al. do not find evidence of a significant increase in trading volume after that tick reduction. Based on the results reported in Panel D for trades of TSE cross-listed shares executed on NASDAQ, the mean effective half-spread increases from 1.782 to 1.851 percent, and the corresponding mean (median) holding period increases marginally (but significantly) from 28.79 (15.43) to 29.27 (23.98) years post-TSE-decimalization.

Based on these preliminary statistics, the positive relationship expected between effective spreads and holding periods on average is not evident. The exception is for share trades executed on the TSE and NASDAQ where the increase in effective half-spreads is associated with an increase in the holding period in the post-TSE-decimalization period (see panel D in both Tables 2-1 and 2-2). For example, for the Canadian cross-listed share trades executed on the TSE and NYSE with(out) options traded on them, the holding period actually increased even though the effective half-spreads on average decreased. In addition, for the Canadian cross-listed share trades executed in AMEX, the increase in the effective half-spread is accompanied by a decrease in holding period post-TSE-decimalization. These preliminary statistics suggest that the Amihud and Mendelson relationship may not systematically hold individually for each primary trade venue. Also, the higher effective half-spreads for the cross-listed share trades executed on the TSE and AMEX and NASDAQ fail to support the official rationale to decrease effective spreads espoused for the minimum quotation increment reductions (MQIRs) implemented by the TSE, and subsequently by NASDAQ.

2.5.2 Comparative Statistics For Various Pairings of the TSE with a U.S. Trade Venue

In this sub-section, holding periods and effective half-spreads for cross-listed share trades executed on the TSE relative to those executed on the AMEX, NYSE and NASDAQ for the pre- and post-TSE-decimalization periods, and for the entire time period are examined. The ratios of holding periods and of effective half-spreads for cross-listed share trades executed in each U.S. trade venue relative to those executed on the TSE between the pre- and post-TSE-decimalization periods also are analyzed.[11] These results are reported in Table 2-3. The latter portion of each panel reports the ratios of the average means, medians and variances of effective half-spreads, ES^{US}/ES^{TSE}, and holding periods, HP^{US}/HP^{TSE}, for the share trades executed in each member of the various pairings between the TSE and the AMEX, NYSE with(out) options traded on them and NASDAQ. The last row of each panel of Table 2-3 reports the p-values of the differences in the ratios of the means, medians and variances of effective half-spreads and holding periods between the pre- and post-TSE-decimalization periods. That is, it reports the p-values of the difference in (ES^{US}/ES^{TSE}) for the pre- and post-TSE-decimalization periods, and in (HP^{US}/HP^{TSE}) for the pre- and post-TSE-decimalization periods.

[Please place Table 2-3 about here]

Based on the results reported in panel A of Table 2-3, the mean effective half-spread (0.792 percent) and mean holding period (7.01) for the share trades executed on the TSE is higher and smaller than the mean effective half-spread (0.678 percent) and mean holding period (45.9 years), respectively, for the same-firm share trades executed on the AMEX over the entire time period examined herein. However, after TSE decimalization, the mean effective half-spread increases for the share trades executed on the TSE (AMEX) to 0.953 (0.792), and the corresponding mean holding period increases (decreases) to 7.05 (42.19) years.

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[11] Similar but unreported statistics are obtained for all the other control variables. The main inferences about the relationship between holding periods and effective half-spreads do not change significantly if they are included.

The ratio of effective half-spreads for AMEX and TSE trades, ES^{US}/ES^{TSE}, decreases from 0.917 to 0.834 post-TSE-decimalization. This change is statistically significant (p-value of 0.029). This result suggests that effective half-spreads increased faster for the share trades executed on the TSE relative to the same-firm share trades executed on the AMEX. The value of the ratio of holding periods for the AMEX and TSE trades, HP^{US}/HP^{TSE}, changes insignificantly from 7.85 to 6.67. These results indicate that the TSE lost trade cost competitiveness to AMEX post-TSE-decimalization, although the ratio of holding periods (volume turnover) remained approximately unchanged in both trade venues for the TSE shares cross-listed in AMEX.

Based on the results reported in panel B of Table 2-3 for TSE shares cross-listed on the NYSE for firms with options traded on them, the mean effective half-spreads is statistically smaller for the share trades executed on the TSE (0.282 versus 0.326 for the share trades executed in the NYSE for the same-firm shares). However, the mean effective half-spread (0.295) is significantly higher for the share trades executed on the TSE relative to the mean effective half-spread (0.227) for the same-firm share trades executed on the NYSE during the post-TSE-decimalization period. The mean holding period for the share trades executed on the TSE (NYSE) increases significantly (marginally) from 2.44 (9.45) to 6.04 (10.20) years post-TSE-decimalization.

The value of the ratio ES^{US}/ES^{TSE} (HP^{US}/HP^{TSE}) decreases from 1.158 (3.96) to 0.803 (2.04) post-TSE-decimalization. These differences are statistically significant (p-values of 0.0001 and 0.0001, respectively). This suggests that the trade cost advantage, as measured by the effective spread, decreased post-TSE-decimalization for share trades executed on the TSE (which marginally increased) relative to the same-firm share trades executed on the NYSE with options traded on them (which significantly increased). The accompanying decrease in the ratio of their holding periods indicates that the TSE's relative share of order flow executions decreased for the TSE shares cross-listed on the NYSE with options traded on them.

Based on the results reported in panel C of Table 2-3 for TSE shares cross-listed in the NYSE for shares with no options traded on them, the mean effective half-spreads and the mean holding periods are significantly smaller for trades executed on the TSE versus same-firm trades executed in the NYSE. The only exception is the insignificant difference in the effective half-spreads for the post-TSE-decimalization period. The mean effective half-spread for the share trades executed on the TSE (NYSE) decreases to 0.481 (0.488) post-TSE-decimalization, and the mean holding period increases (increases) to 4.31 (38.41) years post-TSE-decimalization.

The value of the ratio ES^{US}/ES^{TSE} (HP^{US}/HP^{TSE}) decreases (increases) to 1.074 (9.51) from 1.217 (7.04) from the pre-to-post TSE-decimalization period. The difference is statistically significant with a p-value of 0.021 (0.079). These results imply that the trade cost advantage also decreased for the share trades executed on the TSE relative to the trade costs (effective spreads) for the same-firm share trades executed on the NYSE for shares without options traded on them post-TSE-decimalization. These results are similar to those for the TSE shares cross-listed on the NYSE with options traded on them. However, unlike the TSE shares cross-listed on NYSE with options traded on them, the ratio of holding periods HP^{US}/HP^{TSE} increased post-TSE-decimalization, implying that the TSE gained executed order flow relative to the NYSE for the TSE shares cross-listed on the NYSE without options traded on them.

Based on the results reported in panel D of Table 2-3 for TSE shares cross-listed on the NASDAQ, the mean effective half-spread increases to 1.280 (1.851) from 0.994 (1.782) for the share trades executed on the TSE (NASDAQ) post-TSE-decimalization. However, the mean holding period increases from 5.13 (28.79) years to 7.44 (29.27) years for the same-firm share trades executed on the TSE (NASDAQ). Over the entire time period, the mean effective half-spreads are about 60 percent higher for the same-firm share trades executed on the NASDAQ.[12,13]

[12] According to Chordia, Roll, and Subrahmanyam (2001), the TAQ database reports 'autoquotes' (passive quotes by dealers who officially do not make the market) which inflates the bid-ask spread. They indicate this may add up to ¼ point on either side of the quote, mostly for the less traded shares. These 'autoquotes' are not specifically identified in the TAQ database. Even though the Canadian cross-listed shares on the

The value of the ratio ES^{US}/ES^{TSE} (HP^{US}/HP^{TSE}) decreases from 1.808 (6.34) to 1.468 (4.18) post-TSE-decimalization. Each difference is statistically significant with a p-value of 0.0001 (0.096). This result is similar to that obtained for the TSE shares cross-listed in NYSE with options traded on them (see panel B of Table 2-3). This suggests that the trade cost advantage as measured by effective half-spreads decreased post-TSE decimalization for the share trades executed on the TSE relative to those executed on NASDAQ. This is associated with a decrease in the ratio of holding periods, which indicates that the TSE lost executed order flow share to NASDAQ for the same-firm cross-listed shares.

Three important observations are drawn from these findings. First, the holding periods for the TSE cross-listed share trades executed on the U.S. trade venues are higher than those for the same-firm share trades executed on the TSE, even when their associated effective half-spreads are lower (as is the case for the cross-listed share trades executed on the NYSE with options traded on them). A possible explanation could be that participants in U.S. trade venues may not want to trade Canadian cross-listed shares frequently, due to their lower information awareness relative to U.S. domestic shares. This is supported by studies that find investors concentrate their ownership and trading in domestic shares (Cooper and Kaplanis, 1994; Kang and Stulz, 1997; Huberman, 2001). Another possible explanation could be the higher trade costs (bid-ask spreads) for non-U.S. share trades executed on the U.S. trade venues compared to those for domestic U.S. shares (Bacidore and Sofianos, 2002). Thus, Canadian cross-listed share trades executed on the TSE exhibit shorter holding periods (higher trading) by more informed investors relative to the same-firm share trades executed on the U.S. The latter investors are likely to hold the shares further to

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NASDAQ are less traded on the U.S. relative to their trading on the TSE, it is unlikely that the 'autoquotes' have a material impact on the effective spreads used herein.

[13] Neglect of fiduciary duty by investment dealers on NASDAQ also may be a possible explanation for this difference. Christie, Harris, and Shultz (1994) find that NASDAQ dealers implicitly collude to inflate bid-ask spreads. In addition, payment for order flow, preferencing of orders, and internalization of order flow are pervasive practices in dealer markets. For an interesting review of these practices, see Macey and O'Hara (1997).

diversify the risk of their investment portfolios.[14] These implications are consistent with the investor recognition hypothesis posited by Merton (1987), who demonstrates that investors are more likely to own and trade shares of firms they are more informed about.

Second, the results indicate that the TSE appears to have lost comparative competitiveness with respect to the effective half-spreads for the same-firm share trades executed on the U.S. trade venues post-TSE-decimalization. The ratio of effective half-spreads between the share trades executed on the U.S. trade venues and on the TSE decreased over time. As expected, this decrease generally was accompanied by a decrease in the ratio of their holding periods. The only exception is for the pairing of cross-listed share trades executed on the NYSE for shares without options traded on them and on the TSE, where the ratio actually increased significantly. These findings may have resulted from increased inter-market competition for order flow execution between the TSE and the U.S. trade venues triggered by MQIR implementations by the AMEX, NYSE and NASDAQ, approximately one year after TSE decimalization.[15]

Third, shares that have options traded on them have smaller effective half-spreads and shorter holding periods than their non-optioned counterparts. This is consistent with most theoretical studies, which demonstrate that option trading enhances liquidity (lowers effective spreads) and trading volume (lowers holding periods).

2.5.3 Determinants of Holding Periods for Individual Trade Venues

We use the Seemingly Unrelated Regression approach on cross-sectional and time series data to identify holding period determinants. By adding dummy time variables to equation (2-1), we account for the possibility of a shift in the relationship between holding periods and effective

[14] Non-informed traders are those who do not have private information or seasoned trading skills. Normally, they trade for risk diversification motives. These long-term, passive investors seek to minimize trade costs by trading less frequently. They normally invest through mutual funds that are willing and more likely to attract them (see Nanda, Narayan, and Warther, 2000).
[15] The AMEX and NYSE/NASDAQ reduced their tick size from $1/8^{th}$ to $1/16^{th}$ for issues with prices above $10 U.S. on 17 May 1997 and on 2 June 1997, respectively.

half-spreads post-TSE-decimalization for the same share trades executed on the TSE, and on the U.S. trade venues grouped by listing venue. One important advantage of using the SUR regression approach is that the regression coefficients are estimated simultaneously for the share trades executed on the TSE and the U.S. trade venues. The SUR system also accounts for heteroscedasticity and autocorrelation in the regression residuals across firms.[16] The SUR regression estimated is as follows:

$$HP_{iT} = b_0 + b_1 ES_{iT} + b_2 MV_{iT} + b_3 VAR_{iT} + b_4 MS_{iT} + b_5 ES_{iT} D1 + B_6 MV_{iT} D1 + b_7 VAR_{iT} D1$$
$$+ b_8 MS_{iT} D1 + b_9 D2_{\tau=1995} + \ldots + b_{12} D2_{\tau=1998} + \varepsilon_{iT} \qquad (2\text{-}4)$$
$$i = 1, 2, \ldots, 117$$
$$T = 1, 2, \ldots, 60$$

$D1$ is a dummy variable that equals one from the date of the TSE decimalization (15 April 1996) until the end of 1998, and is equal to zero otherwise. This dummy variable is used to facilitate a test of whether the relationship between holding periods and proportional effective half-spreads, market equity values, return variances and mid-spreads change significantly for the period after the TSE decimalization. $D2_{\tau}$ is a dummy variable used to determine whether the relationship between effective half-spreads and holding periods is related to time-specific events for each year τ (τ = 1995, 1998) during our sample period. All of the other variables are defined as before. The natural logs of all the variables, except the dummies, are used to obtain the estimates of the equation parameters.[17]

Building on equation (2-2), the empirical SUR regression used to estimate ES_{iT} with(out) time dummies is as follows:

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[16] All of the regressions are adjusted for serial autocorrelation. The highly significant values of the coefficients for the serially correlated errors (some of them up to 4 lags) increase the adjusted R^2 of the regressions.
[17] Based on the descriptive statistics, the data exhibit skewness. SUR regression estimations with the variables expressed with natural logarithms generate consistently normalized residuals.

$$ES_{iT} = c_0 + c_1 ES_{iT-1} + c_2 MV_{iT} + c_3 VAR_{iT} + c_4 MS_{iT-1} + c_5 ES_{iT-1}D1 + c_6 MV_{iT}D1 + c_7 VAR_{iT}D1 + c_8 MS_{iT-1}D1 + c_9 D2_{\tau=1995} + \ldots + c_{12} D2_{\tau=1998} + \varepsilon_{iT} \quad (2\text{-}5)$$

where all the variables HP_{iT}, ES_{iT}, MV_{iT}, VAR_{iT} and MS_{iT} are defined as before.

The estimated coefficients for the SUR regressions between holding periods and effective half-spreads, market values, variances of mid-spread returns and mid-spreads with(out) time dummies for the share trades executed on the TSE and for each U.S. trade venue are reported in 2- 4 and 2-5, respectively. [18] The objective of these regressions is to determine whether or not the relationship between holding periods and effective half-spreads holds for the same-firm share trades executed for each pairing of the TSE with each U.S. trade venue. All of the regressions are statistically significant with the lowest R^2 value being 0.561 and 0.812 in Tables 2-4 and 2-5, respectively.

[Please place Tables 2-4 and 2-5 about here]

Based on the results reported in panel A of Table 2-4 for trades executed on the TSE in shares cross-listed on the AMEX, the estimated coefficients for the effective half-spread, market value and the variance of mid-spread returns are significant and carry the expected sign for the entire time period and in the pre- and post-TSE-decimalization periods. The estimated coefficient for the mid-spread is significant with the expected negative sign during the pre-TSE-decimalization period. While the mid-spread has the only significant estimated coefficient shift dummy, its estimated coefficient is not significant post-TSE-decimalization. Nevertheless, its net effect is significant.

The results for share trades executed on the TSE for shares cross-listed in the NYSE with options traded on them are reported in panel B of Table 2-4. The variance of mid-spread returns has the only estimated coefficient that is significant (with the expected sign) during the entire and pre-TSE-decimalization periods. Although the estimated coefficients of the shift dummies are

[18] The unreported p-values of the significance of the estimated coefficients for the post-TSE-decimalization period are displayed as needed.

statistically significant for the effective half-spread, market value and return variance, only the estimated coefficients for the effective half-spread and market value are significant post-TSE-decimalization. They both carry the expected sign.

The results for the share trades executed on the TSE for the shares cross-listed on NYSE with no options traded on them are reported in panel C of Table 2-4. The estimated coefficients for the effective half-spread, market value and mid-spread are significant over the entire time period. However, the estimated coefficient for market value has an unexpected negative sign. This is consistent with Lo and Wang (2000), who unlike Atkins and Dyl (1997a) and following the Merton (1987) model, argue that large firms tend to have more diverse ownership that can lead to higher trading volumes and lower holding periods. Only the estimated coefficients of market value and return variance are significant (and negative) pre-TSE-decimalization. The estimated coefficient for the mid-spread is significant and unexpectedly positive during the entire time period and post-TSE-decimalization.[19] The coefficient estimates for the shift dummies are significant for the effective spread, market value and return variance. Similarly, the estimated coefficients for these three variables are significant post-TSE-decimalization. However, the signs of the market value and mid-spread coefficient estimates are unexpectedly negative and positive, respectively.

The results for share trades executed on the TSE for shares cross-listed on NASDAQ are reported in panel D of Table 2-4. The estimated coefficients of the effective spread and the three control variables are significant with their signs as expected for the entire time period, and pre- and post-TSE-decimalization. The lone exception is the estimated coefficient for return variance, which is significant but positive post-TSE-decimalization.

In summary, the effective half-spread is significantly associated with the expected holding period for the cross-listed share trades executed on the TSE, especially post-TSE-

[19] Angel (1997) argues that a higher stock price (mid-spread) may correspond to a higher than optimal stock price (associated with a non-optimal tick size) which may induce less trading volume and therefore a longer holding period.

decimalization. This result is robust to time-specific general economic conditions and specific events. This is consistent with the Amihud and Mendelson model for the share trades executed on the TSE that are cross-listed on the AMEX, NYSE and NADAQ.

Based on the results reported in panel A of Table 2-5 for cross-listed share trades executed on the AMEX, only the estimated coefficients for the effective half-spread and market value are positive and significant for the entire time period and pre-TSE-decimalization. Although none of the estimated coefficients for the shift dummies are significant, only the estimated coefficient for market value is significant post-TSE-decimalization.

Based on the results reported in panel B of Table 2-5 for TSE cross-listed share trades executed on the NYSE with options traded on them, only the estimated coefficients for market value and mid-spread are significant (with their expected signs) for the entire time period. Only the estimated coefficients for the effective half-spread and market value are significant pre-TSE-decimalization. Only the estimated coefficient for the shift dummy for effective half-spread is significant (and negative). Nevertheless, only the estimated coefficients for the market value and mid-spread are significant post-TSE-decimalization.

Based on the results reported in panel C of Table 2-5 for TSE cross-listed share trades executed on the NYSE for shares without options traded on them, only the estimated coefficients of the effective half-spread and return variance are significant (and positive) for the entire time period. Only the estimated coefficients for the effective half-spread and return variance (marginally) are significant pre-TSE-decimalization. The estimated coefficients for the shift dummies are significant for all variables except the return variance. The estimated coefficients for the effective half-spread and return variance are significant post-TSE-decimalization.

Based on the results reported in panel D of Table 2-5 for the TSE cross-listed share trades executed on NASDAQ, only the estimated coefficients for the effective half-spread, market value and return variance are significant for the entire time period, and pre- and post-TSE-decimalization. The estimated coefficient for the shift dummy is significant for only the mid-spread.

In summary, the relationship between holding periods and effective half-spreads, market values, return variances and mid-spreads tends to be stronger for same-firm share trades executed on the TSE and on the U.S. trade venues, post-TSE-decimalization.

2.5.4 Determinants of Holding Period Differences for Pairs of Competing Trade Venues

Building on equation (2-3), the empirical SUR regression used to identify the determinants of holding period differences for various pairs of competing trade venues is as follows:

$$HP1_{iT} - HP_{iT} = b_0 + b_1(ES1_{iT} - ES_{iT}) + b_2(VAR1_{iT} - VAR_{iT}) + b_3(MS1_{iT} - MS_{iT}) + B_4(ES1_{iT} - ES_{iT})D1 + B_5(VAR1_{iT} - VAR_{iT})D1 + b_6(MS1_{iT} - MS_{iT})D1 + B_7 D2_{\tau=1995} + \ldots + B_{10} D2_{\tau=1998} + \varepsilon_{iT} \quad (2\text{-}6)$$

where all the variables are defined as before. The regressions also are run using ratios instead of differences. Since these results are not materially different from the ones reported below, they are not presented to conserve space.

The regression results for the four U.S. categorizations of the TSE cross-listed share trades are reported in Table 2-6.[20] The results for the TSE shares cross-listed on AMEX are reported in panel A of Table 2-6. Only the estimated coefficients for the differences in effective half-spreads are significant (and positive) for the entire time period, and pre- and post-TSE decimalization. None of the estimated coefficients for the shift dummies are significant.

[Please place Table 2-6 about here]

The results for the TSE shares cross-listed on the NYSE for firms with options traded on them are reported in panel B of Table 2-6. Only the estimated coefficient for the effective half-spread differences are significant for the entire time period and post-TSE-decimalization, and

[20] Market equity (*MV*) as a proxy for firm size is not reported since it is not significant in all of the reported regressions.

none of the estimated coefficients are significant pre-TSE-decimalization. Only the estimated coefficient for the shift dummy for return variance differences is significant.

The results for the TSE shares cross-listed on the NYSE for firms without options traded on them are reported in panel C of Table 2-6. Only the estimated coefficients for the effective half-spread and return variance differences are significant for the entire time period, and post-TSE-decimalization. None of the estimated coefficients are significant pre-TSE-decimalization, and none of the estimated coefficients for the shift dummies are significant.

The results for the TSE shares cross-listed on NASDAQ are reported in panel D of Table 2-6. Only the estimated coefficients for the effective half-spread and mid-spread differences are significant for the entire time period. Only the estimated coefficients for the effective half-spread are significant pre- and post-TSE-decimalization, and none of the estimated coefficients for the shift dummies are significant.

Based on these findings, the hypothesis that an international trade-venue clientele effect exists for Canadian cross-listed share trades executed on the TSE and the same-firm share trades executed on the AMEX, NYSE and NASDAQ can not be rejected, primarily post-TSE-decimalization. Since holding period differences for a pairing of a U.S. trade venue and the TSE are positively related to effective spread differences, a decrease in effective spread differences results in a decrease in holding period differences. This indicates that the TSE lost both comparative trade cost advantage (as measured by effective spreads) and share turnover to these competing U.S. trade venues over the time period considered herein.[21] This suggests that the cross-listing motive of Canadian firms is to reap the benefits of increased visibility, including higher liquidity and lower financing costs.

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[21] These results are consistent with those obtained by Kryzanowski and Zhang (2002). They find that the TSE lost price/cost advantage for a sample of Canadian cross-listed shares traded on the TSE and the major and regional U.S. trade venues (except for NASDAQ) after the TSE decimalization. They suggest that the MQIR implemented in the major U.S. trade venues approximately one year after TSE decimalization may be the most likely reason.

2.5.5 Nature of the Granger Causality Relationship Between Holding Periods and Effective Half-spreads

The theoretical and empirical literatures have not resolved whether changes in quoted and/or effective bid-ask half-spreads are a consequence of changes in stock liquidity as measured by trading volume or vice-versa. Demsetz (1968), Tinic (1972) and Stoll (1978) argue that the magnitude of trading volume determines the size of the bid-ask spread. In contrast, Amihud and Mendelson (1986) suggest that the size of the spreads determines holding period magnitude. Using a sample of shares listed on the NYSE and NASDAQ, Atkins and Dyl (1997a) find that the Granger (1969) causality between holding periods and spreads runs in both directions. However, the non-significant change in trading volumes and the significant decrease in bid-ask spreads that most studies report after the implementation of the MQIRs by the TSE and the major U.S. exchanges suggests that bid-ask spreads do not lead trading volumes.[22]

Since the results presented in the previous sub-section indicate that a significant relationship exists between effective half-spread differences (ratios) for trade venue pairings and their holding period differences (ratios), this sub-section uses Granger causality tests to examine whether or not holding period differences (ratios) lead effective half-spread differences (ratios) or vice-versa, or whether or not feedback effects exist. The bivariate regression for the Granger causality test between the holding period (effective half-spread) ratios and effective half-spread (holding period) ratios is as follows:

$$RES_{iT} = \gamma_0 + \gamma_1 RES_{iT-1} + \ldots + \gamma_k RES_{iT-k} + \lambda_1 RHP_{iT-1} + \ldots + \lambda_k RHP_{iT-k} \quad (2\text{-}7)$$
$$RHP_{iT} = \gamma_0 + \gamma_1 RH_{iT-1} + \ldots + \gamma_k RHP_{iT-k} + \lambda_1 RES_{iT-1} + \ldots + \lambda_k RES_{iT-k}$$

[22] For the impact of the MQIR by the TSE on trading volumes and trade costs, well known studies include Kryzanowski and Zhang (1996), Bacidore (1997), Ahn et al. (1998), and McKinnon and Nemiroff (1999). For the impact of the MQIR by the AMEX, see Ahn et al. (1996), Griffiths, Smith, Turnbull, and White (1998) and Ronen and Weaver (2001). Similarly for the impact of the MQIR by the NYSE, see Goldstein and Kavajecz (2000), Jones and Lipson (20001), and for the NYSE and NASDAQ see Bessembinder (1999). For an excellent survey on decimalization, see Harris (1997).

RES_{iT} (RHP_{iT}) is equal to the ratio ES^{US}/ES^{TSE} (HP^{US}/HP^{TSE}); that is, the effective half-spread (holding period) ratios between the share trades executed on the U.S. trade venue and the same-firm share trades executed on the TSE. The letter k represents the number of months T that each variable is lagged. For robustness, the bivariate regression (2-7) is run at various lag levels (from 2 to 9). The Wald F-statistic tests the joint hypothesis $\lambda_1 = ... = \lambda_k = 0$ for each equation, where the null hypothesis is that *RHP* (*RES*) does not Granger-cause *RES* (*RHP*) in the first (second) equation.

Table 2-7 reports the Granger causality test results between the holding period and effective half-spread ratios for the four pairings of a U.S. trade venue with the TSE.[23] The table reports the Wald F-statistics and their associated probabilities for lag lengths of 2 to 9. The rows indicated with an *a* (*b*) display the F-values and their associated probabilities for a test of whether or not the holding period (effective half-spread) ratios does not Granger cause the effective half-spread (holding period) ratios for the different lag lengths. The results show that the holding period ratios predominantly lead the effective half-spread ratios for all four trade venue pairings. These results may explain why the MQIRs implemented by the TSE and the major U.S. exchanges did not affect trading volume significantly.

[Please place Table 2-7 about here]

Together with the results reported earlier in Tables 2-3 and 2-6, these results suggest the possibility that the decrease in the holding period ratios for share trades executed on the U.S. trade venue and TSE pairing Granger *causes* the relative decrease in their effective half-spread ratio for the same-firm cross-listed shares.

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[23] The results of a number of other Granger causality tests are not reported to save valuable space. Granger causality tests are carried out between the effective spreads and holding periods for the share trades executed on the TSE that are cross-listed on the AMEX, NYSE with(out) options traded on them and NASDAQ. Most of these unreported tests indicate significant feedback effects. Similarly, causality tests are conducted for the same-firm share trades for the corresponding four U.S. trade venue samples. Effective half-spreads lead holding periods for the share trades executed on the AMEX only for lag 6. For the share trades executed on the NYSE with(out) traded options on them, holding periods lead effective half-spreads for most lags. For the share trades executed on the NASDAQ, feedback effects occur for lags 5 to 9.

2.5.6 An Empirical Cross-sectional Model of Volume Turnover

The results reported in the previous two sub-sections for the SUR regressions indicate that relative trading volumes granger-cause relative trade costs. The literature on trading volume as an indicator of liquidity for domestic markets is burgeoning. Karpoff (1986) develops an interesting theory of trading value that is consistent with the empirical evidence. Karpoff (1987) provides an excellent survey of the theoretical and empirical findings for the relationship between prices and trading volume. O'Hara (1995) reviews various theories of trading volume and its role as a relevant information device in the price discovery process. Lo and Wang (2000) investigate the cross-sectional variation of trading volume and find evidence that trading volume may be explained by beta and various proxies of firm characteristics. Using a cross-sectional regression model, Chordia, Subrahmanyam, and Anshuman (2001) find that trading volume volatility is negatively correlated with stocks returns. Lo, Mamayski, and Wang (2001) develop a dynamic equilibrium model of asset prices where they demonstrate that a minimum increment in transaction costs may be reflected in severe share illiquidity.

According to Lo and Wang (2000), the measure of share turnover TO_t 'yields the sharpest empirical implications and is the most natural measure' when analyzing the relation between volume and equilibrium models of asset markets. Following Lo and Wang (2000), an empirical cross-sectional model of the share turnover (difference) for cross-listed share trades executed for a (pair of) trade venue(s) is formulated as follows:

$$TO_t = \alpha_0 + (\alpha_1 + \delta_{ES} NOP)ES_t + (\alpha_2 + \delta_{MV} NOP)MV_t + (\alpha_3 + \delta_p NOP)P_t + (\alpha_4 + \delta_A NOP)A_t + (\alpha_5 + \delta_{\beta TSE} NOP)\beta_t^{TSE} + (\alpha_6 + \delta_{SE} NOP)SE_t + (\alpha_7 + \delta_{\beta US} NOP)\beta_t^{US} + \varepsilon_t \quad (2\text{-}8)$$

$$RTO_t = \alpha'_0 + (\alpha'_1 + \delta_{RES} NOP)RES_i + (\alpha'_2 + \delta_{MV} NOP)MV_t + (\alpha'_3 + \delta_p NOP)P_t + (\alpha'_4 + \delta_{RA} NOP)RA_i + (\alpha'_5 + \delta_{R\beta TSE} NOP)R\beta_t^{TSE} + (\alpha'_6 + \delta_{RSE} NOP)RSE_i + (\alpha'_7 + \delta_{R\beta US} NOP)R\beta_t^{US} + \epsilon_i \quad (2\text{-}9)$$

TO_i is the share turnover for firm i, which is equal to the reciprocal of the holding period (i.e., $1/HP_i$), for the cross-listed share trades executed on the TSE or the U.S. trade venue. ES_i is the effective half-spread or proxy for trade costs. MV_i is the market equity of shares or proxy for firm size. P_i is the stock price. A_i, β_i^{TSE} and SE_i are the intercept coefficient, the slope coefficient and the standard error of the monthly time series regressions of stock i's return on the TSE and the CRSP (orthogonalized) market weighted return, respectively. β_i^{US} is the slope coefficient from the residuals of the time series regression of the CRSP market weighted return with the TSE market weighted return. NOP is a dummy variable that is equal to one if the share does not have options traded on them, and is zero otherwise. The ratios RES_i ... $R\beta_i^{US}$ are the ratios of the share trades executed *on* the U.S. trade venue relative to the same-firm share trades executed on the TSE for TO_i, ES_i ... β_i^{US}. MV_i and P_i are the same in equation (2-9) as in equation (2-8), since we assume that market equity and price are the same across markets for the same shares, to be consistent with the law of one price. The ratio RTO_i is equal to the share volume traded on the TSE relative to that on the U.S. for the same-firm cross-listed shares. This ratio is used to assess the impact of trading volume for the share trades executed *on* the TSE relative to that for the same-firm share trades executed on the U.S. trade venues. All of the variables are converted to natural logarithms, except A_i, β_i^{TSE}, β_i^{US}, RA_i, $R\beta_i^{TSE}$, $R\beta_i^{US}$ and the dummy variable NOP. All variables correspond to monthly averages of daily trade information, except for A_i, β_i^{TSE}, SE_i and β_i^{US}, which correspond to monthly observations.

The time series data for each variable is averaged separately for each firm for the five-year period 1994-1998. There are two shortcomings in using the model with cross-sectional data exist. First, endogeneity between holding periods and effective half-spreads may be present. Second, the regression using ratios may not properly characterize the joint behavior of the variables for share trades executed on the U.S. trade venues and the same-firm share trades executed on the TSE. The reason is that averaging of the data using the full five-time period decreases the possibility of meaningful relations between variables across trade venues compared to that with monthly averages and time series as in the SUR regressions.

The variables ES_t, MV_t and P_t were identified earlier as determinants of holding periods (i.e., reciprocal of share turnover). The included variables implicitly incorporate the possible effects of other determinants (such as trade size, quote size, number of institutional investors and number of analyst following). Huang and Stoll (1997) use trade and width size as a proxy for trading volume, and most market microstructure studies find that company size is highly associated with price, number and size of institutional investor trading and number of analyst following (Brennan and Subrahmanyam, 1998).

The inclusion of A_t, β_t^{TSE} and SE_t comes from the relevance that asset pricing models such as the CAPM and APT, have in explaining the relationship between risk and return. Their significance as determinants of share turnover may provide interesting implications for stock returns. In models of international cross-listing, the inclusion of β_t^{TSE} and β_t^{US} permits one to evaluate simultaneously the exposure of the cross-listed firm to domestic and international market risk, respectively (Foerster and Karolyi, 1999).

The sign of the determinants ES_t, and MV_t (P_t) are expected to be negative (positive) as discussed earlier.[24] The expected sign of A_t, which captures excess returns, may depend on the degree of information heterogeneity. For example, more (less) private information induces higher (lower) trading volume reducing (increasing) expected excess returns. Since β_t^{TSE}, β_t^{US} and SE_t measure systematic and idiosyncratic risk, respectively, which are components of return volatility, their expected signs are positive. Higher return volatility is expected to create more portfolio rebalancing, which in turn induces more trading volume.

The means, medians and standard deviations of the variables used as proxies for the determinants of share turnover for the TSE shares cross-listed on the U.S. are reported in Table 2-

[24] Unlike Atkins and Dyl (1997a), Lo and Wang (2000) consider that *MV* should be positively related to share turnover *TO*. They argue that large firms have more diverse ownership, which may lead to higher trading volume.

8. The values of the descriptive statistics for each variable are displayed in columns (1) through (8). The average mean (median) values of β_t^{TSE} are over 0.95 for the share trades executed on the TSE relative to the lower β_t^{TSE} values under 0.6 reported for the same-firm share trades executed on each U.S. trade venue. That is, the cross-listed share trades executed on the TSE are more sensitive to the domestic Canadian stock market than the same-firm share trades executed on the U.S. trade venues. The average mean (median) values of β_t^{US} are negative across most trade venues (except for the cross-listed share trades executed on the TSE and the same-firm share trades executed in the NYSE with options traded on them). This suggests that the Canadian shares may be a valuable hedging tool for investors who trade on the U.S. stock markets since their expected returns vary inversely with the returns on the CRSP market weighted index. The values of SE_t and RA_t do not follow a consistent pattern across trade venues.

The mean values of the ratios of ES_t and TO_t are greater than one in all panels. The mean values of the ratios of ES are similar and greater than one (approximately 1.065) for cross-listed share trades executed on the AMEX and NYSE with(out) options traded on them. For the share trades executed on NASDAQ, the average mean ES ratio is much higher (1.57). The mean values of the ratios of TO_t are 10.37, 8.88, 6.26 and 14.7 for cross-listed share trades executed on the AMEX, NASDAQ and NYSE with(out) options traded on them, respectively. These values indicate that the trading volume (effective half-spread) for the share trades executed on the TSE is higher (smaller) relative to the trading volume (effective half-spread) for the same-firm share trades executed on each U.S. trade venue, respectively. These results are consistent with those reported earlier in Table 2-3, where the holding periods and effective half-spreads for the share trades executed on the U.S. trade venues are much higher than those for the share trades executed on the TSE, except for the share trades executed on the NYSE with(out) options traded on them, where the effective half-spreads are similar or lower than those executed on the TSE.

[Please place Table 2-8 about here]

Panels A, B and C of Table 2-9 report the estimated coefficients of the cross-sectional regressions of TO_t on the various determinants for the cross-listed share trades executed on the AMEX, NASDAQ and the NYSE with(out) options traded on them, respectively. Sub-panels A1, A2 and A3 report the results for the share trades executed on the TSE, for the same-firm share trades executed on the AMEX, and for the ratios of share trades executed on the AMEX relative to the same-firm share trades executed on the TSE, respectively. Sub-panels B1, B2, B3 and C1, C2, C3 report similar results for the shares cross-listed on the NASDAQ and on the NYSE with(out) options traded on them, respectively.

[Please place Table 2-9 about here]

Panel A1 reports the results for the share trades executed on the TSE for the cross-listed shares in AMEX. The estimated coefficients of ES_t, MV_t, and β_t^{TSE} have the expected sign and are statistically significant. β_t^{US} is positive but only marginally significant. The coefficient of A_t is negative and statistically significant. This suggests that higher excess returns may be due to a liquidity premium resulting from scarce informed trading. In Panel A2, none of the estimated coefficients are significant for the share trades executed on the AMEX. Based on panel A3 for the relative share turnovers for share trades executed on the AMEX and the TSE, the estimated coefficients of P_t, RA_t and RSE_t have their expected signs and are statistically significant. This result suggests that higher prices induce more trading volume on the TSE relative to that on AMEX. Since the estimated coefficient of RA_t is positive and significant, this suggests that higher expected returns (induced by lower information) on the AMEX relative to that on TSE produce higher trading volume on the TSE relative to that on AMEX. The significant coefficient estimate for the ratio RSE_t may indicate higher perceptions of relative idiosyncratic risk for the share trades executed on the AMEX, which may induce higher trading volume on the TSE. Interestingly, the estimated coefficient for *RES* is positive but not significant.

Panel B1 of Table 2-9 displays the TO_t results for the share trades executed on the TSE for the cross-listed shares on NASDAQ. The estimated coefficients of ES_t and MV_t are negative and significant, and for β_t^{TSE} and SE are positive and marginally significant. The estimated coefficient of P_t is significant but with the wrong negative sign (-0.418). A possible reason is that NASDAQ investors prefer to trade low priced shares since this increases the actual number of shares that may be traded. The estimated coefficients for the same-firm share trades executed on the NASDAQ are reported in Panel B2 of Table 2-9. The estimated coefficients of ES_t, MV_t and SE_t have their expected signs and are significant. Panel B3 of Table 2-9 reports that the estimated coefficients for RES_t, MV_t and $R\beta_t^{US}$ have their expected signs and are significant. The positive sign of RES_t implies that higher relative effective half-spreads for share trades executed on the NASDAQ induce higher trading turnover on the TSE for the same-firm shares. The estimated coefficients for RA_t and RSE_t are significant but with the wrong sign. This is the opposite result to that reported in Panel A3 for the AMEX. The negative estimated coefficient of RA_t means that higher relative expected returns (perhaps by less informed trading) for the share trades executed on the NASDAQ relative to the same-firm share trades executed on the TSE, induce lower relative share turnover on the TSE relative to NASDAQ in the same firm shares. The negative estimated coefficient of RSE_t indicates that higher relative idiosyncratic risks for the share trades executed on the NASDAQ motivate less relative trading turnover on the TSE in the same firm shares. A possible explanation for both results is that NASDAQ trading may be mainly from 'noise' trading for cross-listed shares, which may induce more trading (herding) relative to the TSE where more investors may trade using better quality of information which usually originates in the home (Canadian in this case) market.

Panels C1 and C2 of Table 2-9 report the estimated coefficients for the share trades executed ON the TSE and the NYSE. The estimated coefficients of ES_t, MV_t, β_t^{TSE} and β_t^{US} have their expected signs and are significant for the TSE and NYSE for shares with traded options on them. The estimated coefficients of P_t are significant but have the wrong negative signs. This suggests that investors prefer to trade lower price shares, as was found for the share trades executed on the TSE for the cross-listed shares on NASDAQ. For the cross-listed shares in the NYSE without options traded on them, ES_t is the only common variable that has significant coefficient estimates for both trade venues. The unreported coefficients and p-values for the share trades executed on the TSE (NYSE without options traded on them) are −1.23 (−2.08) and 0.0001 (0.0001), respectively. The estimated coefficient of P_t (SE_t) is negative (positive) and (marginally) significant for the share trades executed on the TSE for the cross-listed shares on the NYSE without options traded on them. Based on panel C of Table 2-9, the estimated coefficient of RES_t is positive and significant for the cross-listed shares on the NYSE with(out) options traded on them. This confirms our previous findings that increasing (decreasing) relative effective half-spreads for the share trades executed on the NYSE increase (decrease) share turnover for the same-firm share trades executed on the TSE. The estimated coefficients of RA_t and RSE_t are negative and positive, respectively, and are statistically significant only for the cross-listed shares on the NYSE with options traded on them. This suggests that higher relative excess returns for the share trades executed on the NYSE for the cross-listed shares with options traded on them induces a decrease in relative share turnover on the TSE for the same-firm shares, and that higher relative idiosyncratic risks for the share trades executed on the NYSE induce higher relative share turnovers for the same-firm share trades executed on the TSE.

To summarize the findings in this sub-section, the effective half-spread or ES_t (relative effective half-spread or RSE_t) is the only significant determinant of (relative) share turnover for the share trades executed in all trade venues except for AMEX. No other variables seem to 'explain' (relative) share turnover consistently. A similar finding for the determinants of holding periods using SUR regressions was reported earlier.

2.6 CONCLUSIONS

The findings in this study are consistent with the hypothesis that an international trade-venue clientele effect exists for Canadian cross-listed share trades executed on the TSE, AMEX, NYSE and NASDAQ. The relative effective half-spreads between the Canadian cross-listed share trades executed on these U.S. trade venues and the same-firm share trades executed on the TSE are positively associated with the same or longer relative holding periods, particularly post-TSE-decimalization. Changes on effective half-spreads appear to be the only variable that is consistently associated with changes in holding periods for the various samples of cross-listed share trades examined herein.

Based on the SUR regressions and the non-parametric tests, the relative holding periods for the share trades executed on the U.S. versus TSE trade venue is decreasing, and is associated with decreasing relative effective half-spreads. This implies that the TSE has consistently lost executed order flow share to the U.S. major trade venues, and that this is due to the increasing relative effective spreads for Canadian cross-listed shares. TSE decimalization, which was implemented to avoid the future loss of trading volume to the U.S. trade venues by reducing the MQIR primarily for cross-listed shares, did not obtain the desired outcome. On the contrary, effective half-spreads increased for the share trades executed on the TSE for the cross-listed shares on the AMEX and NASDAQ, did not change significantly for the cross-listed shares on NYSE with options traded on them, and only decreased for the cross-listed shares on NYSE without options traded on them. Although the holding periods remain lower for the TSE, the ratio of holding periods for the share trades executed on the U.S. trade venues relative to the same firm share trades executed on the TSE actually narrowed. These results may have been aided by the MQIRs implemented by the AMEX, NYSE and NASDAQ one year after the TSE decimalization. However, it is difficult to say whether or not the loss of TSE competitiveness in terms of trading volume and effective half-spreads would have been more pronounced without the TSE's move to decimalization.

CHAPTER 3

VALUATION EFFECTS OF DOMESTIC AND INTERNATIONAL SEASONED CANADIAN OFFERINGS BY FIRMS CROSS-LISTED ON THE NYSE/AMEX OR NASDAQ

3.1 INTRODUCTION

This chapter analyzes the determinants of abnormal returns associated with domestic and international seasoned equity offerings (SEOs) at the announcement and issue dates. These SEOs are by Canadian companies whose shares are cross-listed on the NYSE/AMEX or NASDAQ. The chapter also examines whether or not the determinants of abnormal returns for both domestic and international SEOs are the same for the shares cross-listed on the NYSE/AMEX or NASDAQ

To study the determinants that may influence the direction and magnitude of the price impact at the announcement (issue) date for the domestic and international SEOs for Canadian cross-listed shares (CCS) is of great importance. It also is interesting to examine whether or not the determinants differ for the Canadian shares that are cross-listed on the NYSE/AMEX or NASDAQ separately for the domestic and international SEOs. Simultaneously analyzing the price impact at the announcement (issue) date for the domestic and international Canadian SEOs, and also separately by U.S. cross-listing venue (NYSE/AMEX and NASDAQ), provides valuable evidence on whether the price-impact determinants are the same regardless of the geographic location of SEO placement and cross-listing U.S. exchange.

Well-documented studies report that the trading behavior of a stock changes when the stock shifts from one exchange to another (whether domestically or internationally). For example, when a stock moves from AMEX (or NASDAQ) to NYSE, the quoted spread declines, return volatility declines, and share turnover increases. [25] Similar changes occur for shares that cross-list

[25] For example, see Hasbrouck and Schwartz (1988), Kadlec and McConnell (1994), Christie and Huang (1994), and Bessembinder (1998).

internationally in a more liquid market (e.g., non-U.S. companies listing on the U.S.).[26] The trading behavior of the stock also may be due to its special characteristics, its membership in a specific economic sector or the characteristics of the trading mechanism where the stock trades. For example, shares that are listed on the NYSE/AMEX usually belong to traditional sectors (value firms) compared to those on the NASDAQ, which usually are members of the high-tech sector (growth firms). In addition, the different trading mechanisms at the NYSE/AMEX and NASDAQ may affect the trading behavior of firms in the same sector but trading in distinct trade venues differently (see Sanger and McConnell, 1986; Affleck-Graves et al., 1994; and Huang and Stoll, 1996). Most of this evidence supports such differences for internationally cross-listed shares.

Studies that analyze the determinants of Canadian SEOs include Jog and Schaller (1993), Mittoo (1997) and Kryzanowski and Rakita (2000), who exclude Canadian cross-listed shares on the U.S. Our study is the first to analyze simultaneously the determinants of announcement and issue date price effects for the domestic and international equity seasoned (primary and secondary) offerings by Canadian companies that have shares cross-listed on the U.S.

Canadian companies that want to cross-list their shares into international markets (mostly the U.S.) may access a greater investor base by doing so. Non-U.S. firms may be able to position larger portions of their shares on the U.S. without causing the larger price drops that would occur if they issue new equity in their smaller and thinner domestic markets. Thus, international seasoned offerings by Canadian cross-listed firms may be a method to lower the cost of capital (Foerster and Karolyi, 1999, 2000; and Errunza and Miller, 2000).

The activity of non-U.S. companies on the U.S. market has grown very rapidly in terms of number of companies, market capitalization, and share volume traded. At the end of 1998, the total number of non-U.S. companies on the NYSE was 379, with a total worldwide market

[26] See Foerster and Karolyi (1998), and Doukas and Switzer (2000). In an excellent survey, Karolyi (1998) reports evidence of why companies list shares abroad.

capitalization of $3.6 trillion, and annual trading volume of $564.7 billion. This compares to 304 non-U.S. companies listed at the end of 1996, with a total market capitalization of $2.3 trillion, and annual trading volume of $335.3 billion. At the end of 1998, Canada has the largest number of firms listed on the NYSE. These 69 firms have a market capitalization of $226 billion, and annual trading volume of $76.9 billion. This is in contrast to 1996 when the 63 Canadian listings had a market capitalization of $186.4 billion, and a trading volume of $59.7 billion. At the end of 1998, 67 non-U.S. firms with a dollar trading volume of $6.3 billion were listed on the AMEX. The number of non-U.S. securities on NASDAQ at the end of 1998 was 484 with a total dollar trading volume of $215.9 billion. The non-U.S. NASDAQ-AMEX companies at the end of 1998 total 507. The two leading non-U.S. countries of company nationality with U.S. listings are Canada with 189 companies and Israel with 77 firms.

By examining the determinants of the price reaction at the announcement date, our study also provides some evidence on whether or not the price elasticity of demand is finite in that the size of the offering is the only relevant variable that explains the abnormal returns at the announcement date. A major problem encountered in analyzing the elasticity of demand for shares is to determine whether any price decline at the time of the offer announcement is due to firm-information-related effects (changes in firm fundamentals or future cash flows) or market-information-related effects (downward sloping demand curves). Most seasoned offerings are announced when the stock has had prior positive cumulative abnormal returns. The belief is that managers try to take advantage of these price run-ups to sell equity since they believe the announcement of the issue conveys less informational asymmetry to the market (Korajczyk, Lucas, and McDonald, 1990). However, investors are not fooled, and they react by adjusting the price downward for possible adverse information effects (Myers and Majluf, 1984). If a prior price run-up exists and the price impact post-announcement is proportional to the size of the offering, then the interpretation of the results is ambiguous. This pattern could result because the issue conveys adverse firm-specific information or because the demand curve is downward sloping, or both (see Hudson, Jensen and Pugh, 1993). On the other hand, Viswanath (1993) shows that a positive relationship between prior price run-up and abnormal returns at the announcement of an equity offering is interpreted by the market as the firm having future investment projects with positive net present values.

The relevant empirical results reported herein show that the determinants of abnormal returns at the announcement (issue) date are different for the SEOs of Canadian cross-listed shares, and the determinants depend mostly on the geographic placement of the SEO and the offer's U.S. listing venue. Variables that proxy for firm-information-related effects (prior changes in the abnormal effective spread and abnormal volume) are negatively related to the abnormal returns at the announcement date for the domestic SEOs. In contrast, prior changes in share turnover, good news (favorable press articles) and the offering size are positively related to the abnormal returns at the announcement date for the domestic SEOs. Similarly, prior abnormal volume and bad news (unfavorable press articles) are negatively related to the abnormal returns for the international SEOs. Volume turnover and whether the issue is primary (not secondary) are positively related to the abnormal returns at the announcement date. Prior cumulative abnormal returns (*PreCAR*), changes in *PreCAR*, and number of trades (share turnover) are negatively (positively) related to the abnormal returns at the issue date for the domestic SEOs.

When the domestic and international SEOs by U.S. listing venue (NASDAQ or NYSE/AMEX) are analyzed, we find that *PreCAR*, prior changes in *PreCAR*, prior volume turnover, and good news are the significant determinants, and are positively related to the abnormal returns at the announcement date for the domestic SEOs by issuers cross-listed on the NASDAQ. Prior changes in abnormal volume and abnormal effective spread (relative size of the offering and volume turnover) are negatively (positively) related to the abnormal returns at the announcement date for the domestic SEOs for the shares of issuers that are cross-listed on the NYSE/AMEX. No significant determinants are identified for the international SEOs for the Canadian issuers whose shares are cross-listed on either the NASDAQ or NYSE/AMEX.

For the issue dates for the domestic SEOs, the relative size of the offering, *PreCAR* and changes in *PreCAR* are the only significant determinants, and they are negatively related to the abnormal returns at the issue date for the shares cross-listed on the NASDAQ. The abnormal returns at the announcement date is the only variables that is significant and is positively related to the abnormal returns at the issue date for the shares cross-listed on the NYSE/AMEX. No determinants are significant for the international SEOs for the issuers whose shares are cross-listed on the NASDAQ or NYSE/AMEX.

These findings suggest that the determinants of the abnormal returns at the announcement (issue) date for the SEO offerings of Canadian firms whose shares are cross-listed vary significantly depending on the geographic placement of the SEO and the U.S. cross-listing venue. Contrary to expectation, the size of the offering is positively related to the abnormal returns in most regressions. This evidence together with the finding that most significant determinants are firm information related do not support the notion that the demand curves for the Canadian domestic and international SEOs are downward sloping.[27]

The remainder of this chapter is organized as follows. Section 3.2 reviews the relevant literature on the possible causes of the price impact of seasoned equity offerings, with particular emphasis on the firm-information-related and finite price elasticity of demand hypotheses. Section 3.3 describes the sample and data collection. In section 3.4, the tests for abnormal returns on the announcement and issue dates are examined. The test methodology and descriptive statistics are explained in section 3.5. Section 3.6 presents and analyzes the empirical results. Section 3.7 concludes.

[27] For theoretical and empirical evidence supporting the finite price elasticity of demand hypothesis see Allen and Postlewaite (1984), Parsons and Raviv (1985), Shleifer (1986), Bagwell (1991), Loderer et al. (1991a), Loderer, Sheehan, and Kadlec (1991b), Asquith and Mullins (1993), Hudson et al. (1993), Galloway, Loderer, and Sheehan (1998), Hodrick (1999), Switzer and Zoghaib (1999), Chaplinski and Ramchand (2000), and Kaul, Mehrotra, and Morck (2000).

3.2 FIRM-INFORMATION-RELATED VERSUS MARKET-INFORMATION-RELATED STUDIES FOR SEOS

The main findings related to the impact of seasoned equity offerings around the announcement and issue dates, which are drawn from a number of theoretical and empirical studies, are summarized in Table 3-1. The last two columns report whether the findings are due to firm-information-related effects or not, and the relationship between the price reaction at the announcement (issue) date and the offering size, respectively.

[Please place Table 3-1 about here]

No agreement exists on whether the price impact of a seasoned equity offering is unambiguously due to firm originated information or not. However, the majority of the studies suggest that seasoned equity offerings are dependent on economic conditions and firm characteristics, which is consistent with the firm-information-related hypothesis. Good economic conditions (economic expansion), good firm standing (for example, increased prior cumulative abnormal returns), and increasing liquidity (proxied by decreasing spreads) are factors normally associated with the announcement of seasoned equity offerings. The results are also consistent with lower information asymmetry at the time of the announcement. This implies that a less negative price reaction occurs if any of above situations occurs. Any inference drawn that the price impact of the offering is due only to the size of the offering (and therefore is consistent with finite price elasticity of demand) should be questioned when one or more of above conditions are met (for example, see Asquith and Mullins (1993) and Hudson et al. (1993)).

The elasticity of demand for shares is similar to that for goods and services. The percentage change in price should correspond to a negative percent change in the quantity demanded and vice-versa, other things being equal. If no information-related events are assumed to exist at the announcement of a seasoned equity offering, demand curves for CCS should exhibit a negative relationship between changes in price and quantity traded. Thus, the announcement of a stock offering should cause a decline in the price of the stock proportional to its size. The price impact should be associated with the magnitude of the price elasticity of demand for the shares. High price-elasticity of demand curves should have a minor impact on price at the announcement and listing of an equity offering (Loderer et al., 1991a).

3.3 THE SAMPLE AND DATA COLLECTION

The sample consists of all domestic and international seasoned primary (secondary) equity offerings (SEOs) by Canadian firms cross-listed on the NYSE/AMEX and NASDAQ during the period from 1993 to 1998. The specific numbers of domestic offerings by the NYSE/AMEX listed firms are 62: 49 primary and secondary SEOs, respectively, and by the NASDAQ listed firms are 54: 45 primary and 9 secondary SEOs, respectively. The corresponding numbers for the international offerings for the NYSE/AMEX listed firms are 26: 22 primary and 4 secondary, respectively, and for NASDAQ listed firms are 16: 8 primary and 8 secondary, respectively. Private equity placements, special warrants or other types of securities offerings are excluded. The international seasoned offerings are either floated in a single foreign country or simultaneously in various countries (including Canada), while the domestic issues are floated only in Canada. The domestic and international announcements for these offerings are identified in Appendix 3-A and 3-B, respectively, along with each company's ticker symbol, announcement and issue (actual or expected) dates, the market where its secondary offering was issued, and the U.S. trading venue where the firm is cross-listed. The announcement and issue dates are drawn from the National Post Data Group. About 31 percent of the domestic announcements occur during 1993. This is followed by 19 percent and 17.2 percent in 1998 and 1997, respectively. The proportion of SEOs cross-listed in 1995 and 1997 is heavily weighted to the Canadian companies that are cross-listed on the NASDAQ.

About one-third of the international SEO announcements occur in 1996. This is followed by 26.2 percent and 19.0 percent of the SEO announcements in 1997 and 1995, respectively. The proportion of Canadian SEOs for Canadian shares cross-listed on the NASDAQ is similar to that of the NYSE in 1996 and 1998. However, in 1993 and 1994, there are no and only one listing related to a CCS on NASDAQ, respectively.

Daily stock returns (adjusted for dividends and stock splits), closing prices, trading volumes and volume turnover (trading volume divided by shares outstanding, adjusted for stock splits), closing bid and ask quotes and number of trades for the Canadian cross-listed shares *traded* in the Toronto Stock Exchange are obtained from the Canadian Financial Markets Research Centre (CFMRC). Except for the Canadian risk-free rate (proxied by the monthly Canadian T-bill rate),[28] the TSE300 market weighted index and the monthly number of shares outstanding for the Canadian cross-listed shares, also are drawn from the CFMRC. The U.S. market weighted index and the daily U.S. risk-free rate, as proxied by the one-month U.S. Treasury Bill rate, are drawn from the CRSP database. The U.S. market index and the U.S. risk-free rate are converted into Canadian dollars. The daily mid-quote price is used when missing prices or zero prices occur for firm *i*, and other relevant variables such as number of trades, volumes and bid and ask quotes are available. The number of such occurrences was relatively minor. Number and type of print media articles (good news, bad news and no news) to detect pre (post) announcement information are based on the data extracted from the *Canadian News Disc via WebSPIRS, Globe & Mail CD and Winnipeg Free Press* and *ABI/Inform Global on ProQuest Direct* for 1993-1998.

3.4.1 TESTS FOR ABNORMAL RETURNS ON THE ANNOUNCEMENT AND ISSUE DATES FOR CCS

To obtain the abnormal returns around and on the announcement and issue dates we use a two factor IAPM specified in Canadian dollars. This model controls for the domestic (Canadian) market returns and the foreign (U.S.) market returns, and uses dummy variables for different event window periods before, during, and after the announcement and issue dates of the

[28] I am grateful to Dr. Lorne Switzer for providing me with the Canadian monthly T-bill rate.

international seasoned CCS offerings. The main reason to use both market indices emanates from the notion that the stock returns of international cross-listed companies may be affected not only by the domestic but also by international stock market risk (Foerster and Karolyi, 1999).

3.4.1 Test methodology

The stock price reactions at the announcement date and the other window periods for each seasoned international CCS offering are computed first. The stock price reactions are estimated using the following regression:

$$R_{it} = a_i + b_i R^{TSE}_{mt} + c_i R^{US}_{mt} + d_i R^{TSE}_{mt} {*} DI + e_i R^{US}_{mt} {*} DI + \gamma_{1i} DCAR_t + \gamma_{2i} DAD_t + \gamma_{3i} DINT_t + \gamma_{4i} DID_t + \gamma_{5i} DPOST_t + \varepsilon_{it} \quad (3\text{-}1)$$

The subscript t refers to one trading day, a_i is the intercept for firm i, and b_i and c_i are the parameter estimates for the TSE market risk premium (R^{TSE}_{mt}) and the U.S. market risk premium (R^{US}_{mt}), respectively, where the latter is orthogonalized to the TSE market risk premium R^{TSE}_{mt} is equal to the TSE300 market weighted index return minus the Canadian risk-free rate. R^{US}_{mt} is the residual of the regression between the CRSP market weighted index return minus the U.S. risk-free rate on the TSE market risk premium (R^{TSE}_{mt}). Both of these excess returns are converted to Canadian dollars. R_{it} is the excess return for the CCS trades executed on the TSE for firm i, and is equal to stock return for firm i (adjusted for dividends and splits) minus the Canadian risk-free rate. The dummy DI takes the value of one over the period one day after the announcement day (AD) and ending 25 days after the issue day (ID). The dummy variable $DCAR_t$, which corresponds to the pre announcement window period, takes on values of one over the period -25 through -2 days relative to the announcement day of the seasoned international CCS offering, i.e., [AD-25, AD-2], and is zero otherwise. We include this dummy variable to control for any positive abnormal performance prior to the announcement date.[29] DAD_t is a dummy variable that equals one on the three-day announcement date, [AD-1, AD+1], and is zero otherwise.

For the announcement (issue) date of the seasoned offerings, we use a three-day period to fully capture the market's response. For some stocks, the market reaction is best-captured one day before the announcement (issue) date, and for some others the next day after the announcement (issue) date since the price adjustment may not be completely observed until that day. The dummy variable $DINT_t$ equals one in the interim period from two days after the announcement day until two days before the three-day issue day (ID), i.e., [AD+2, ID-2], and zero otherwise. DID_t is a dummy variable taking the value of one on the issue date, [ID-1, ID+1], and zero otherwise. The dummy variable for the post listing event window period, $DPOST_t$, takes the value of one from the period starting two days after the issue day and ending 25 days after the issue day, i.e., [ID+2, ID+25], and zero otherwise.

The parameters $\gamma_{1i}, \ldots, \gamma_{5i}$ are the mean daily abnormal returns generated for the trading days in each of the event window periods for firm *i*. For example, for the announcement date, [AD-1, AD+1], the dummy variable takes the value of one. Therefore, $3\gamma_{2i}$ corresponds to the three day cumulative abnormal return by firm *i*. In the same vein, the cumulative abnormal return for the period, [AD-25, AD-2], is equal to 24 times γ_{1} The estimation period in our sample starts from 200 trading days prior to the announcement day (AD) and ends 75 trading days after the issue day (ID). Therefore, the abnormal returns relative to the two main events (announcement and issue of the seasoned international CCS offerings) and the other window periods are estimated simultaneously. For robustness, daily abnormal returns and cumulative abnormal returns prior, during and after the announcement and issue dates are obtained for

[29] Some other time periods also are considered such as [AD-75, AD-2] and [AD-50, AD-2]. No significant differences are found with respect to the period [AD-25, AD-2]. The later period is selected as more reliable to avoid any other possible company events, which are more likely to happen by using the former time periods.

different event window periods and statistically analyzed.

All cumulative abnormal returns in each of the event window periods are averaged across all firms. A Z-statistic is used to test for significance since we assume that stock returns are approximately log-normally distributed and cross-sectionally independent. This is because the announcements and the actual or expected listings (completions) of the offerings for the different firms occur at different dates.

3.4.2 Empirical Results

Tables 3-2 and 3-3 report the cumulative average abnormal returns (CAAR) for the various event window periods for the domestic and international samples, respectively, for the seasoned domestic offerings. Regression results for the domestic sample based on equation (3-1) are reported in Panel A of Table 3-2. *DCAR* is equal to 8.69 percent and is highly significant at the 1 percent level (Z-value of 5.16). The CAAR on the announcement date [AD-1, AD+1] is a non-significant –0.86 percent (Z-value of -1.50). The CAAR at the actual or expected issue date [ID-1, ID+1] is 0.24 percent and is not significant (Z-value of 0.42). The beta for the TSE market risk premium (orthogonalized CRSP) is positive (negative) and highly (marginally) significant. However, their beta shifts are not significant.

[Please place Tables 3-2 and 3-3 about here]

Panel B of Table 3-2 reports the CAAR for various event windows, including the average abnormal returns of each of the 10 days before and after the announcement and issue days. The average abnormal returns for all days before the announcement are positive and significant during [AD-25, AD-11], [AD-1, AD-2] and for days -5, -4 and -2, and negative and significant one day after the announcement day. In comparison, on the right hand side of Panel B, the average abnormal returns for [ID-25, ID-11] and days -3 and +4 around the issue date are equal to, +2.59, -0.87 and +0.70 percent, and are significant at the 5 percent level.

The results for the international sample based on equation (3-1) are reported in Panel A of Table 3-3. The CAAR on the announcement date [AD-1, AD+1] is equal to –1.99 percent and is significant (Z-value of –2.78). The average beta for the TSE (orthogonalized CRSP) market risk premium is positive and statistically significant (non-significant) at the 1 percent level. Their beta shifts are not significant. With respect to the other window intervals, the left-hand side of Panel B reports that the period before the announcement date, [AD-10, AD-2], is positive and significant at the 5 percent level, and days -7 and –4 are positive and significant at the 10 percent level. In the right-hand pane of Panel B of Table 3-7, days –3 and –1 before the issue date are positive and significant at the 10 and 5 percent level, respectively.

Based on the results reported in Panels A of Tables 3-2 and 3-3, the significance of *DCAR, DAD, DID* and *DPOST* for the domestic and international samples of domestic and international seasoned offerings do not seem to follow similar patterns. For example, *DAD* (*DID*) is negative (positive) and significant only for the international sample. Alternatively, *DCAR* (*DPOST*) is positive (negative) and significant for the domestic (international) sample only. This suggests that domestic and international SEOs are affected differently in terms of price impact before and after the announcement (issue) dates.

Tables 3-4 and 3-5 report the CAAR for the various event window intervals for the domestic samples of shares cross-listed on the NASDAQ and NYSE/AMEX, respectively. Regression results for the domestic sample with shares cross-listed on NASDAQ are reported in Panel A of Table 3-4. The prior CAAR (*DCAR*) for the pre-announcement period [AD-25, AD-2] is 9.93 percent and is statistically significant at the 1 percent level (Z-value of 4.34). The CAAR on the announcement date [AD-1, AD+1] is an insignificant (and negative) -0.42 percent (Z-value of - 0.48). The CAAR at the issue date [ID-1, ID+1] is also negative (-0.43 percent) and not significant (Z-value of -0.43). The beta for the TSE market risk premium is +0.6458 and is significant at the 1 percent level. The beta for the orthogonalized CRSP market risk premium and the beta shifts for the TSE market risk premium and the orthogonalized CRSP market risk premium are not significant.

[Please place Tables 3-4 and 3-5 about here]

Panel B of Table 3-4 reports the CAAR for various event windows, including the average abnormal return for each of the 10 days before and after the announcement and issue dates. The periods [AD-25, AD-11], [AD-10, AD-2] and day –5 before the announcement day are positive and statistically significant at the 5 percent level. Day –8 is positive and significant at the 10 percent level. However, for the first and third days after the announcement date, the abnormal returns are negative and statistically significant at the 5 percent level. In the right-hand pane of Panel B of Table 3-4 the period before the issue date, [ID-25, ID-11], and day -3 are positive and negative, respectively, and significant at the 5 percent level. Days +4 and +6 are positive and negative, respectively, and both are significant at the 10 and 1 percent levels, respectively. In addition, the window interval [ID+11, ID+25] is positive and statistically significant at the 10 percent level. The abnormal returns for all of the other days or periods are not statistically significant.

The results for the domestic sample with shares cross-listed on NYSE/AMEX are reported in Panel A of Table 3-5. The CAAR on the announcement date [AD-1, AD+1] is equal to –1.24 and is significant at the ten percent level (Z-value of –1.65). The average betas for the TSE and the orthogonalized CRSP market risk premiums are equal to 0.9305 and -0.2622, and are significant at the 1 percent level. The only significant average beta shift at the 10 percent level is a 0.1687 increase on the TSE beta.

Panel B of Table 3-5 (left-hand pane) reports that the CAARs for interval window periods, [AD-25, AD-11] and [AD-10, AD-2], and the average abnormal return for day -4 (before the announcement day) are all positive and significant at the 1 percent level. In comparison, days +1 (+4) are negative (positive) and significant at the 5 (10) percent levels. In contrast, for some days before and after the issue date, the abnormal returns alternate from negative to positive and vice versa, and are significant at various statistical levels (right-hand pane of Panel B).

Finally, Tables 3-6 and 3-7 report the CAAR for the various event window intervals for the international samples of shares cross-listed on the NASDAQ and NYSE/AMEX, respectively. Regression results for the domestic sample with shares cross-listed on NASDAQ are reported in Panel A of Table 3-6. The CAAR on the announcement date [AD-1, AD+1] is significant (and negative) at –2.50 percent (Z-value of –2.11). The CAAR at the issue date [ID-1, ID+1] is positive (3.65 percent) and significant at the 10 percent level (Z-value of –1.84). The beta for the TSE and the orthogonalized CRSP market risk premiums are +0.9390 and +0.7279, and are significant at the 1 percent level, respectively. The beta shifts are not significant. The CAAR for the window interval after the issue date [ID+2, ID+25] is negative (-10.3%) and significant at the 5 percent level (-1.98). Panel B of Table 3-6 reports that the only significant CAAR corresponds to the event window period [ID+11, ID+25], and is equal to -9.65% (p-value of –2.08) in the right-hand pane of Panel B.

[Please place Tables 3-6 and 3-7 about here]

The results for the international sample with shares cross-listed in NYSE/AMEX are reported in Panel A of Table 3-7. The CAAR on the announcement date [AD-1, AD+1] is equal to –1.67 and is significant at the ten percent level (Z-value of –1.84). The average betas for the TSE and the orthogonalized CRSP market risk premiums are equal to 0.9070 and -0.3287, and are significant at the one and ten percent levels, respectively. No beta shifts are significant.

Panel B of Table 3-7 (left-hand pane) reports that the interval window periods before the announcement date, [AD-25, AD-11] and [AD-10, AD-2], are negative and positive at the 10 and 5 percent levels, respectively. The average abnormal return for day –4 is negative and significant at the 5 percent level, and the average abnormal returns for day 0 and day +3 are positive and negative, respectively, and all of these average abnormal returns are significant at the 5 percent level. On the other hand, the window interval, [ID-10, ID-2], and days -9, -7 and -1 before the issue date are all positive and significant at the 10 percent level (right-hand pane of Panel B).

Summarizing and based on the results reported in Panels A of Tables 3-4 and 3-5, the price impact at the announcement date (*DAD*) is only significant for the domestic SEOs of the shares that are cross-listed on the NYSE/AMEX. However, for both types of cross-listed shares (NYSE/AMEX and NASDAQ), a positive and significant price run up occurs before the announcement date. On the other hand, only for the international SEOs for the shares that are cross-listed on the NASDAQ, the price impact is positive (negative) and significant at the issue (post-issue) date (see Panels A of Tables 3-6 and 3-7).

These findings suggest that the price impact at the announcement date of the domestic SEOs varies significantly between the shares cross-listed on the NASDAQ and NYSE/AMEX. For the international SEOs also the price impact varies significantly between the shares cross-listed on the NASDAQ and NYSE/AMEX, mostly for the issue date. In other words, the results reveal that the trading dynamics prior and during the announcement (issue) dates as measured by the *DCAR*, *DAD*, *DID* and *DPOST* behave differently for the samples differentiated by U.S. cross-listing venue for the domestic and international offerings even though all the trades occur on the TSE.

In the next section, we pursue this finding further by examining the determinants of the abnormal returns at the announcement (issue) dates for the domestic and international seasoned offerings, respectively, and then differentiated by whether the shares are cross-listed on the NASDAQ and NYSE/AMEX. In particular, we examine whether the variables that explain the abnormal returns of domestic and international SEOs for all sample pairs are the same.

3.5 DETERMINANTS OF THE ABNORMAL RETURNS ON THE ANNOUNCEMENT AND ISSUE DATES FOR CCS

3.5.1 Hypotheses and Methodology

Two null hypotheses are tested. The first null hypothesis is that the expected determinants of abnormal returns at the announcement (issue) date of the domestic Canadian SEOs are the same as those for the international Canadian SEOs for the shares cross-listed on major U.S. exchanges. The second null hypothesis is that the determinants of the abnormal returns at the announcement (issue) date are the same for the shares cross-listed on the NASDAQ and NYSE/AMEX separately for the domestic and international SEOs, respectively. Furthermore, if the offering size is the common determinant for all samples examined herein and is negatively related to the abnormal returns at the announcement (issue) date, this means that the demand curves slope down for the Canadian cross-listed shares regardless of SEO placement and U.S. listing exchange.

For the announcement and issue dates for firm i, we estimate the following cross-sectional regressions for the domestic and the international seasoned offerings (first hypothesis) and separately for the domestic and the international SEOs for the shares cross-listed on the NASDAQ and NYSE/AMEX, respectively (second hypothesis):

$$\begin{aligned} ADAR_i \text{ or } IDAR_i = {} & a_0 + (a_1 + \delta_{OFFSIZE}INT)OFFSIZE_i + (a_2 + \delta_{CHCAR}INT)CHCAR_i + \\ & (a_3 + \delta_{CHTO}INT)CHTO_i + (a_4 + \delta_{CHABVOL}INT)CHABVOL_i + \\ & (a_5 + \delta_{CHABESPREAD}INT)CHABESPREAD_i + (a_6 + \delta_{CHTRADES}INT)CHTRADES_i + \\ & (a_7 + \delta_{ADB}INT)ADB_i + (a_8 + \delta_{ADG}INT)ADG_i + (a_9 + \delta_{DNS}INT)DNS_i + \varepsilon_i \end{aligned} \quad (3\text{-}2)$$

where:

$ADAR_i$ = Cumulative abnormal return for the three-day announcement date, [AD-1, AD+1], which is equal to three times the estimate γ_{2i} obtained in equation (3-1).

$IDAR_i$ = Cumulative abnormal return for the three-day issue date, [ID-1, ID+1], which is equal to three times the estimate γ_{4i} obtained in equation (3-1).

$OFFSIZE_t$ = The ratio of the size of the offering announced by firm *i* to the total number of shares outstanding before the announcement (issue) date (Loderer et al., 1991a).

INT_t = Dummy variable that equals one if the announcement is international, and zero if domestic.

$PreCAR_t$ =Average of the cumulative daily differences in the returns for firm *i* and the TSE300 index following Korajczyk et al. (1990).

TO_t = Average of the daily annualized volume turnover. It is equal to the daily-annualized share volume divided by the total number of shares outstanding (Easley, Kieffer, O'Hara, and Paperman, 1996).

$ABVOL_t$ = Average of the difference of the daily actual and expected trading share volumes (Bessembinder and Seguin, 1992; Jiang and Kryzanowski, 1998).[30]

$ABESPREAD_t$ = Average of the difference of the daily actual and expected relative effective half-spreads. Modified version of the quoted spread as a proxy for partial anticipation by Tripathy and Rao (1992).

$TRADES_t$ = Average of daily number of transactions (Kryzanowski and Jiang, 1998).

ADB_t = Dummy variable that is equal to one if bad (unfavorable) news is conveyed in press articles for the period around the announcement [AD-10, AD+5] occurs, and it is zero otherwise. [31]

ADG_t = Dummy variable that is equal to one if good (favorable) news in conveyed by press articles for the period around the announcement date [AD-10, AD+5], and it is zero otherwise.

[30] For each announcement, the expected trading volume is obtained from the best-fitted ARMA model based on the actual series of trading volumes until the residuals are 'white' noise. A similar procedure is used in calculating *ABESPREAD*.

[31] Initially regressions are run with the actual number of bad news [*ADNB*], good news [*ADNG*], and no-news [*ADNN*] counts. More significant coefficient estimates and higher adjusted R^2 result with the use of the dummies *ADB* and *ADG*.

ADN_t = Dummy variable that is equal to one if the news is neither favorable nor unfavorable (no-news) around the announcement date [AD-10, AD+5], and it is zero otherwise.

DNS_t = Dummy variable that is equal to one if issue is primary SEO, and is zero if it is a secondary SEO, and

ε_t = Average error term that is assumed to be independently and normally distributed $\sim N(0,\sigma^2)$.

The variables *CHCAR, CHTO, CHABVOL, CHABESPREAD* and *CHTRADES* are defined as the change in the average value of the firm-information variables *PreCAR, TO, ABVOL, ABESPREAD* and *TRADES* (previously defined) between the period [AD-150, AD-76] and [AD-75, AD-2]. For the regressions involving *IDAR*, the changes in the average values are obtained using the same time periods. Similarly, *IDB, IDG* and *IDNN* correspond to the dummy variables for bad, good and no-news articles for the time period around the issue date [AD+6, ID+5].

We also use an alternative to equation (3-2) by replacing *CHCAR, CHTO, CHABVOL CHABESPREAD* and *CHTRADES* with the information variables *PreCAR, TO, TRADES, ABVOL* and *ABESPREAD*, which correspond to the period [AD-75, AD-2]. The purpose is to examine whether trading behavior prior to the announcement of seasoned offerings also explains the market reaction at the announcement (issue) dates.[32] Equation (3-2) should result in more solid and reliable determinants than equation (3-2) without the change variables, since the behavior of the information variables in equation (3-2) take into account changes in their average mean values between two consecutive periods prior to the announcement date. By comparison, equation (3-2) without differences takes into consideration only the average mean values for the period prior to the announcement date.

[32] Additionally, we regress equations (1) and (2) using all of the above variables based on the time periods [ID-150, ID-76] and [ID-75, ID-2] for the issue date [ID]. The results do not change materially.

For all samples analyzed, the coefficient for the size of the offering, *OFFSIZE*, is expected to be statistically significant. We also expect a strong and permanent negative abnormal return proportional to *OFFSIZE* for the announcement date compared to the issue date if markets are efficient. We assume that the expected negative abnormal return will be reversed in the days following the issue date. If this scenario is supported, and none of the firm-information variables are significant, this would suggest that the demand curves are downward slopping. On the other hand, if firm-information variables are significant (either with or without differences), the signs of the estimated coefficients are expected as follows.

The expected signs of the information variables are the same for the variables with differences (equation (3-2)) and without them. However, the expected signs for the information variables in equation (3-2) without differences will be examined since it is more intuitive to relate them to the extant theoretical and empirical literature than the changes for the same variables in equation (3-2). The estimated coefficient of *PreCAR* is mixed, as previous empirical studies have found. For example, Masulis and Korwar (1986), and Korajczyk et al. (1990) find a negative correlation between the abnormal returns at the announcement of SEOs and the cumulative abnormal returns prior to the announcements. On the other hand, a positive relationship between prior CAR and the abnormal returns at the announcement date are consistent with the empirical results found by Asquith and Mullins (1986), and Kryzanowski and Rakita (2000), and the theoretical model of Viswanath (1993). Thus, the actual sign of the estimated coefficient of *PreCAR* may be contingent on the specific samples of Canadian cross-listed offerings examined herein.

The inclusion of *TO* as a firm information variable follows Easley et al. (1996) who demonstrate that higher (lower) trading volume is associated with lower (higher) probability of informed trading, and therefore, in lower (higher) price impact at the announcement date. Thus, the expected estimated coefficient of *TO* is positive. Alternatively, Hasbrouck (1991) also reasonably argues that the innovation captures the private information of a trade. Thus, innovation in volume (*ABVOL*) is included and used as proxy variable for firm-information-related volatility (Bessembinder and Seguin, 1992; Jiang and Kryzanowski, 1998). However, abnormal (unexpected) volume also could be due to positive or negative volume shocks. Negative *ABVOL* would imply less trading volume than expected, which would suggest private information leakage or anticipation about the imminent equity offering, which may result in a lower negative price impact or lesser price impact. On the other hand, positive *ABVOL* would indicate current volume is higher than expected. In the context of equity offerings and the well-documented negative price impact, we conjecture that positive shocks to volume would predominate. That is, less favorable price impact at the announcement date will take place due to higher trading volume (i.e., higher buying by uninformed investors relative to the selling by informed (insider) investors) prior to the announcement of the SEOs.[33, 34]

Based on George, Kaul, and Nimalendran (1994), and Jiang and Kryzanowski (1998), *TRADES* is included as a proxy for firm-information-related volatility. Since positive *ABVOL* and *TRADES* may be used as substitutes, the expected coefficient of *TRADES* also is expected to be negative. That is, a higher number of trades would indicate higher informed trading resulting in lower abnormal returns at the announcement date.

ABESPREAD is included as a relevant variable to assess the magnitude of the information asymmetry faced mainly by the market maker with respect to informed traders. This variable may proxy for 'partial' anticipation (similar to negative *ABVOL*) following Tripathy and Rao (1992) who find a declining spread prior to the announcement for OTC SEOs. They argue that decreasing spreads are consistent with information asymmetry being resolved even before the public disclosure of the event. This suggests that the equity offering may be partially anticipated. *ABESPREAD* is a better proxy than the proportional quoted spread used by Tripathy and Rao

[33] For example, articles documenting insider trading before SEOs include Karpoff and Lee (1991), Gerard and Nanda (1993), Safieddine and Wilhelm (1996), and Gombola, Lee, and Liu (1999).
[34] Additionally, informed investors are more likely to disguise their trading in price run-ups, in which liquidity (noise) trading (buying) exceeds insider selling.

because it includes the effective spread, which captures what investors actually pay when trading. The expected sign for the estimated coefficient of *ABESPREAD* is negative.[35,36]

The coefficient estimate of *DNS*, i.e., if the issue is a primary (not secondary) equity offering, is expected to be more favorable (less negative) than if the issue is secondary. The reason is that equity offerings increase the investor base, and therefore increase the liquidity of the stock compared to secondary offerings where no increase in outstanding shares occurs. Additionally, selling of secondary offerings may be subject to higher adverse selection since it implies share sales by officers or directors, which the market may interpret as being more unfavorable than the selling of primary equity offerings (Mikkelson and Partch, 1985).

A significant and positive sign is expected for the coefficient estimates of the dummy variable *ADG* (*IDG*) as a proxy for good news, and a negative sign is expected for the dummy variable *ADB* (*IDB*) as a proxy for bad news at the announcement (issue) dates. On the other hand, no significant and an undetermined sign is expected for the coefficient estimate for the dummy variable (*ADN*) as a proxy for no-news. Some of the relevant article features that result in it being selected as good news before the announcement (issue) date are: (1) analysts upgrade its stock rating, (2) positive earnings announcement, (3) dividend increase announcement, (4) listing of the stock in the NYSE, AMEX or NASDAQ, (4) upgrade in credit rating, (5) spin off of a division or company business, (6) important contracts awarded in terms of higher expected revenues (profits) and (6) announcement that the underwriters sold their overallotment option entirely.

[35] Changes in the actual effective spread also are used. Although the results do not vary significantly, the problem with using effective spreads is that it is biased upward for lower priced shares, which does not occur with abnormal effective spreads.

[36] Initially, we also include market-to-book value as a firm-information variable as in Jung et al. (1996). About half of the total companies did not have this ratio or such data was incomplete during the time period of the announcements. This makes market-to-book value unsuitable to test for firm-information effects. Additionally, variables such as standard deviation of returns as a proxy for return volatility and firm size, which are considered positively and negatively related to adverse selection, respectively (see Van Ness, Van Ness, and Warr, 2001), are used but not found significant. Firm size is highly correlated with trades (0.69), and unexpectedly with *ADNB* (number of bad news) (0.51). Based on Hull and Kerchner (1996), the inclusion of the percent of the dealer's gross spread (SEO fee) as a regressor leads to insignificant estimates for all the regressions.

Article features that result in an article being classified as bad news are as follows: (1) analysts downgrade the stock, (2) an earnings announcement below expectations, (3) an announcement of production reduction, (4) a union strike, (5) a delisting from the TSE 100 Index, and (6) reports of insider selling by company executives among others. No-news articles are as follows: (1) announcement of the offering and purpose, (2) dealers accepting to underwrite the issue, (3) 'good' news reported by the company about the profitability of the new projects financed by the equity offering, (4) opinion articles about the company or the stock, and (5) articles that have no relationship to the offering nor convey good or bad news, such as the announcement of the promotion of company executives.

3.5.2 Descriptive Statistics

This section reports the descriptive statistics for the variables used as determinants in equation (3-2) with(out) differences. The table below reports the size of the offering in percent at the announcement and issue dates for Canadian domestic and international SEOs and for each U.S. cross-listing venue.

	Offering Size in Percent	
SEO Placement and U.S. Listing Venue	Announcement Date	Issue Date
Domestic	19.4	19.9
a) NASDAQ	22.6	23.1
b) NYSE/AMEX	16.7	17.2
International	18.5	20.2
a) NASDAQ	26.5	28.6
b) NYSE/AMEX	13.6	15.0

The offering size at the announcement and issue dates do not vary across SEO geographic placement and U.S. cross-listing trade venues. However, the offering size is higher for the shares cross-listed on the NASDAQ, mostly for the international SEOs and at the issue date.

Tables 3-8, 3-9 and 3-10 report descriptive statistics for the firm-information variables *PreCAR*, *TO*, *ABVOL*, *ABESPREAD* and *TRADES*. They display the average mean and medians for the domestic and international SEOs for the sample periods S1, [AD-150, AD76], and S2, [AD-75, AD-2], and the p-value for the average difference (column 3). Column 4 reports the percent of SEOs where the average mean (median) of each information variable of S2 is significant higher than S1 at the 5 percent level. The opposite is reported in column 5. By comparing the means and medians of columns (4) and (5), column (6) reports the type of information (undetermined, positive or negative) expected to predominate and its possible effect on the price impact at the announcement date (column 7). Since undetermined, positive or negative information is expected to have an undetermined, positive or negative effect on the price impact at the announcement date, column (7) should mirror column (6). These results should be seen as preliminary or crude measures of the expected price impact at the announcement date based on the analysis of the expected signs for the information variables discussed in the previous section. We assume that only the significant variations between the average mean (median) values of two contiguous samples before the announcement of the SEO may have a relevant impact on the abnormal returns, instead of using only the average mean (median) value of the sample (S2) prior to the announcement of the SEO across firms.

[Please place Tables 3-8, 3-9 and 3-10 abcut here]

In all three tables, *PreCAR* is the only variable whose difference in mean and median is positive and statistically significant at the 10 percent level, regardless of SEO geographic placement or U.S. cross-listing trade venue. This suggests significant price run-ups (as measured by *PreCAR* above 5 percent) occur before the announcement of SEOs in all samples, which is consistent with most empirical studies of SEOs. However, the information effect in the abnormal returns is undetermined based on the empirical studies previously discussed. Therefore, the direction of the relationship between prior CAR and the abnormal returns for Canadian cross-listed share offerings is an empirical one.

Panel B of Table 3-8, which reports the results for the international SEOs, shows that the expected sign of *ABVOL* is undetermined. This suggests that no significant price effect may occur. The reason is that the percent of SEOs with significantly higher means (medians) for sample S2 relative to sample S1 (and reported in column (4)) is the same as the percent of SEOs with significantly higher means (medians) for sample S1 relative to sample S2, as reported in column (5). Similarly in Panel B of Table 3-9, the expected type of information that may dominate for *ABVOL* is not unambiguous based on the disparate results between the means and medians that are reported in columns (4) and (5). Assuming that the total average mean value would predominate (as reported in column (2)), the expected effect in the abnormal returns should be negative.

Panel B of Table 3-10 reports that no sample period is expected to dominate based on the percent of the mean (medians) value of SEOs for *ABESPREAD* that are significant, as reported in columns (4) and (5). Therefore, no effect in abnormal returns is expected. For all the other firm-information variables, the expected signs and their effects on the abnormal returns are clearly identified. It also is important to emphasize that the proportion of SEOs with significant and higher *PreCAR* and *TRADES* in S2 relative to S1 is above 50 percent. It occurs to a lesser extent for *TO*. However, for *ABVOL* and *ABESPREAD*, the proportion of values that are significantly higher for S2 relative to S1 or vice-versa, is reduced greatly. A possible reason is that these variables are innovations which are more likely to exhibit more random behaviors than those which are not innovations, such as *PreCAR*, *TO* and *TRADES*.

Table 3-11 reports the absolute numbers and proportions of press articles corresponding to no-news, good news and bad news for the domestic and international SEOs around the announcement [AD-10, AD+5] and issue [AD+6, ID+5] dates, respectively. It also reports the same type of information separately for U.S. listing venue, NASDAQ and NYSE/AMEX, for the domestic and international SEOs. Although the proportion of total press articles for domestic SEOs is two thirds higher than for international SEOs, the percent of articles containing no-news and good news is evenly spread across SEO geographic placement and U.S. listing venues around the announcement and issue dates (approximately 40%). On the other hand, the proportion of articles containing bad news is much lower relative to the good news across SEO geographic placement and U.S. listing venues. The proportion of bad news is much higher for the international SEOs for the shares cross-listed on NASDAQ, and much higher for the domestic SEOs for the shares cross-listed on the NYSE/AMEX. If past behavior is a reasonable representation of future behavior, this result suggests that bad news for international SEOs is more likely for shares cross-listed on NASDAQ, and bad news for domestic SEOs is more likely for the shares cross-listed in NYSE/AMEX. Why this occurs is a topic left for further investigation.

[Please place Table 3-11 about here]

3.6 EMPIRICAL RESULTS FOR THE ABNORMAL RETURN DETERMINANTS

3.6.1 Determinants of the Abnormal Returns for the Domestic and International SEOs

In this section, we estimate equation (3-2) with(out) differences to test for the expected determinants of the abnormal returns at the announcement and issue dates for the domestic and international samples. The results for the determinants of the abnormal returns at the announcement date are simultaneously calculated for the domestic and international samples of SEOs, and are reported in Table 3-12. To save space, only the relevant equations are displayed. To provide additional insight, some unreported results are referred to as required. Panel A of Table 3-12 reports six combinations of equations, which are based on the correlation matrix between the independent variables of equation (3-2). Since *CHTRADES* and *CHABVOL* are considered substitute variables proxing for changes in volatility, they are not simultaneously used in the same equation. Similarly, *CHTO* and *CHABESPREAD* are considered as being substitute variables for information asymmetry; i.e., higher *CHTO* implies less probability of informed trading (higher liquidity) which may be associated with lower effective spreads and therefore lower *CHABESPREAD*. On the other hand, although *CHTO* and *CHTRADES* proxy for different information-related effects, they are highly correlated (0.48). Thus, the combinations of information variables are *CHTO* with *CHABVOL*, and *CHABESPREAD* with *CHTRADES*.

Panel A of Table 3-12 reports that the coefficients of *OFFSIZE* for the total (which refers to the total sample when the coefficient for *OFFSIZE*INT* is not estimated) and domestic samples are positive and significant, as reported in columns (1)-(6). The sensitivity shift for international *OFFSIZE* is negative and significant. However, the net effect of the unreported estimated coefficient for the international *OFFSIZE* (i.e., *OFFSIZE*INT*) is not significant for any of the regressions. These findings indicate that the size of the offering for the domestic sample has a positive effect on abnormal returns, instead of the negative price effect as hypothesized in the finite price elasticity of demand hypothesis.

[Please place Table 3-12 about here]

The estimated coefficients for the total *CHCAR* variable and for the domestic *CHCAR* are significant at the 10 and 5 percent levels, respectively, as reported in columns (1) and (2). The sensitivity shift for international *CHCAR* is negative and marginally significant. However, the net effect of the unreported estimated coefficient for the international *CHCAR* (i.e., *CHCAR*INT*) is not significant for any of the regressions. This finding shows that *CHCAR* is significantly related to the abnormal return at the announcement date for the domestic sample in only one regression. The other variables that are statistically significant and negatively associated with the abnormal returns for the announcement date (and only for the domestic sample) are *CHABVOL* and *CHABESPREAD* at the one and ten percent levels, respectively. The positive and significant coefficient estimate of *CHTO* indicates that lower information trading occurs and has a positive impact on the abnormal returns at the announcement date.

The significance of *CHABVOL* suggests that changes in volatility have a negative impact on abnormal returns at the announcement date. On the other hand, the estimated coefficient of *CHABESPREAD* is negative and higher, although only statistically significant at the ten percent level. This means that changes in the abnormal effective spread have a negative market reaction as captured in the abnormal returns at the announcement date. All the regressions are highly significant at the one percent level as measured by the probability of the F-statistic.[37] The estimated coefficient of domestic *DNS* is positive and significant at the 10 percent level in equations (columns) (4) and (6), and for the total *DNS* is positive and significant at the 5 percent level in equations (1) and (3), and at the 1 percent level in equation (5). The sensitivity shift is not significant in any of the regressions. The net effect of the unreported estimated coefficients for the international *DNS* are significant at the one percent level in equation (2), and at the five percent level in equations (4) and (6). The estimated coefficients (p-values) are 0.0312 (0.0051), 0.284 (0.0294) and 0.0267 (0.0429), respectively. These results suggest that primary equity offerings have a positive effect on abnormal returns for the domestic SEOs, and stronger positive effect on abnormal returns for the international SEOs. On the other hand, the estimated coefficient for the sensitivity shift for the international *ADB* (dummy for bad news) is negative and significant at the five percent level in equations (2), (4) and (6), and not significant for the domestic *ADB*. The net effect of the unreported estimated coefficients (p-values) are .-0.0377 (0.0002), –0.0383 (0.0017) and –0.0370 (0.0007) for equations (2), (4) and (6), respectively. These results indicate that unfavorable press articles affect negatively the abnormal returns at the announcement date only for the international SEOs. A possible reason is that for domestic SEOs a company's bad news may be normally leaked before the press media announcement so that the

[37] Also, we use changes in the same variables from the period before to after the announcement of the seasoned offering, i.e., [AD-75, AD-2] to [AD-1, AD+75]. The unreported results, which use the same procedure for the issue date, show that generally neither the estimated coefficients for the information variables nor *OFFSIZE* are significant.

market reaction is already reflected in the share price at the time of the announcement. A possibility that is less likely to occur for international SEOs.

Panel B of Table 3-12 reports the results of regressions using the values of the information variables *PreCAR*, *TO*, *ABVOL*, *ABESPREAD* and *TRADES* for the period [AD-75, AD-2]. The relevant variables that explain the abnormal return at the announcement date for the domestic sample are *OFFSIZE* and *ADG*. The estimated coefficients are positive and marginally significant for *OFFSIZE* in only one out of three regressions, and positive and marginally significant for *ADG* in equation (2) and positive and significant at the 5 percent level in equation (4). The relevant variables for the international sample are *TO*, *ABVOL* and *ADB*. The net effect (p-value) of the unreported estimated coefficient of the international *TO* is 0.0062 (0.0001). This suggests that higher volume turnover positively affects the abnormal returns only for the international SEOs. The net effect (p-value) of the unreported estimated coefficient of the international *ABVOL* is –4E-07 (0.0676). This indicates that unexpected information-related volatility affects negatively the abnormal returns for the international SEOs. Finally, the net effect (p-value) of the unreported estimated coefficients of the international *ADB* are -0.0419 (0.0002), -0.0420 (0.0020) and –0.0430 (0.0004), respectively. These results reveal that bad news negatively affects the expected returns only for the international SEOs, a finding consistent with the one found in panel A.

Summarizing, since the expected determinants for the domestic and international SEOs are different for the announcement date, we fail to support the null hypothesis that common determinants exist for the domestic and international SEOs. The only variable that is somewhat common is if the equity offering is primary (not secondary), which positively affects the abnormal returns at the announcement date. On the other hand, since the relationship between the abnormal returns is positively related to the size of the offering, *OFFSIZE*, positively related to the information variable, *CHTO*, and negatively related to *CHABESPREAD* and *CHABVOL* in the domestic sample, we do not find enough evidence to support the notion that the demand curves for *domestic* SEOs are downward sloping. A similar conclusion is reached for the international SEOs, since the firm-information variables *TO* and *ABVOL* are significantly related to the abnormal returns at the announcement date. The significant relationship between abnormal returns and firm-information variables suggests that an increase in information asymmetry and information-related volatility prior to the announcement date negatively affects the abnormal returns at the announcement date of the domestic and international SEOs. None of these results seems to conform to the findings of the theoretical and empirical results reported earlier in Table 3-1.

We now run tests to find whether common determinants exist to explain the abnormal returns at the issue date. Panel A of Table 3-13 reports the results for the determinants of the abnormal returns at the issue date for the domestic and international samples. These cross-sectional regression results include two additional variables, *ADAR* and *DINT*, which correspond to the abnormal returns for the announcement date [AD-1, AD+1] and for the interim period between the announcement and issue dates [AD+2, ID-2], respectively. The only variable that is statistically significant is *CHCAR* for the domestic sample. The estimated coefficient is negative and significant for all three equations at the five percent level (see columns (2), (4) and (6)). However, regression equations (4) and (6) are not statistically significant, i.e., the p-values of the regressions are not significant.

In Panel B of Table 3-13, the *PreCAR* for the domestic sample are negative and significant for all three regressions at the one percent level. The estimated coefficient of *TO* is positive and significant at the five percent level. The estimated coefficient for *TRADES* is also positive and significant at the one percent level in column (6). The estimated coefficient for the dummy *IDB* is negative and significant at the ten percent level in only one equation out of three. These results are based on regressions that are significant at the five percent level. The unreported coefficient estimate of *IDB* for the international SEOs is positive (0.0435) and not significant at

(0.1030) in equation (2) in panel A, and is positive (0.0498) and significant (0.0952) in equation (6) in panel B. The regressions are significant at the 10 and five percent levels, respectively.

[Please place Table 3-13 about here]

These estimates contrast with those found for the announcement date. At this date the variables that have significant influence on the abnormal returns for the domestic sample are different from those found at the issue date. Based on these findings, we also fail to support the hypothesis that common determinants exist for the domestic and international SEOs at the issue date. Additionally, *OFFSIZE* does not have any significant effect on the abnormal returns at the issue date for both the domestic and international samples. Thus, we do not find evidence to support the conjecture that the demand curves are downward sloping for the domestic and international SEOs when considering the issue date.

3.6.2 Determinants of the abnormal returns for the shares cross-listed on the NASDAQ and NYSE/AMEX separately for Domestic and International SEOs

This section tests for the determinants of the abnormal returns in equation (3-2) with(out) differences for the shares cross-listed on the NASDAQ and NYSE/AMEX separately for the domestic and international issues at the announcement and issue dates.

Panel A of Table 3-14 reports the results for the shares cross-listed on the NASDAQ for the domestic issues based on the determinants in equation (3-2). The estimated coefficient of *CHCAR* is positive and significant at the one percent level for the shares cross-listed on NASDAQ for the domestic issues, as reported in columns (2), (4) and (6) in Panel A of Table 3-14. *ADG* is another variable that is statistically significant and negatively associated with the abnormal returns for the announcement date, and only for the shares crosslisted on the NASDAQ sample. It is significant at the five percent level in columns (2) and (4), and at the ten percent level in column (6). The estimated coefficient of *DNS* is positive and significant at the ten percent level only in column (6). However, the unreported coefficient estimates of *DNS* for the shares cross-listed on the NYSE/AMEX are positive and significant at the ten percent level for equations (2) and (6), respectively. Their unreported coefficients (p-values) are 0.0258 (0.0815) and 0.0216 (0.0630), respectively. Similarly, *OFFSIZE*, *CHTO*, *CHABVOL*, and *CHABESPREAD* are statistically significant only for the shares cross-listed on the NYSE/AMEX based on the coefficient estimates reported in Panel A of Table 3-14, and their unreported p-values. Specifically the estimated coefficients (p-values) of *OFFSIZE* are 0.0838 (0097) and 0.088 (0.0038) for equations (4) and (6). The unreported estimated coefficients (p-values) of *CHTO*, *CHABVOL* and *CHABESPREAD* are 0.0087 (0.0545), -5E-7 (0.0324) and –0.2964 (0.0317) for columns (4) and (6), respectively. All of the regressions are highly significant at the one percent level as measured by the probability of the F-statistic.

[Please place Table 3-14 about here]

Panel B of Table 3-14 reports the results of regressions using the values of the information variables *TO*, *PreCAR*, *TRADES*, *ABVOL*, and *ABESPREAD* for the period [AD-75, AD-2]. *PreCAR*, *TO* and *ADG* are the relevant variables that explain the abnormal returns at the announcement date for the shares cross-listed on the NASDAQ sample. The estimated coefficients are positive and significant for *PreCAR* and *TO* (at the five percent level), and positive and significant at the one percent level for *ADG*. On the other hand, based on unreported coefficient estimates, variables for the shares cross-listed on the NYSE/AMEX sample that are positive and significant (at the ten percent level) are *DNS* (for regressions (2) and (4), and *OFFSIZE* for regression (4)). The estimated coefficients (p-values) for *DNS* and *OFFSIZE* are 0.0255 (0.0986), 0.0212 (0.0934) and 0.1032 (0.0934), respectively.

The results reported in Panels A and B of Table 3-14 indicate that different determinants influence the abnormal returns for the shares cross-listed on the NASDAQ and NYSE/AMEX, respectively, for the domestic SEOs. Interestingly, the variables that are relevant for the shares cross-listed on the NASDAQ represent positive information as reported by their positive and significant estimated coefficients (i.e., *CHCAR*, *ADG*, *PRECAR* and *TO*). In contrast, the variables that are relevant for the shares cross-listed on the NYSE/AMEX combine variables with positive information as reported by their positive signs (*OFFSIZE*, *CHTO* and *DNS*) and variables related with firm-information volatility (*CHABVOL*) and dealer's asymmetric information (*CHABESPREAD*). However, based on the significant and negative abnormal returns at the announcement date for the shares cross-listed in NYSE/AMEX (-1.24 with Z-value of 1.65), we infer that the *CHABVOL* and *CHABESPREAD* convey negative information, which predominates in the explanation of the negative abnormal returns for the shares cross-listed on the NYSE/AMEX. This compares to the less negative and non-significant abnormal returns at the announcement date for the shares cross-listed on the NASDAQ (-0.0042 with Z-value of –0.48).

For example, the negative coefficient of *CHABESPREAD* indicates that the higher the abnormal effective spread, the more negative is the price impact on the announcement date. In other words, the higher the average value of the actual effective spread relative to the expected effective spread during the period [AD-75, AD-2] compared to the period [AD-150, AD-76], the lower the abnormal return at the announcement date. This suggests that information asymmetry increases in the period prior to the SEO announcement for the sample of shares cross-listed on NYSE/AMEX. *CHABVOL* also is negative and statistically significant, suggesting that the actual value of the trading volume is higher than its expected value during the period [AD-75, AD-2] compared to the period [AD-150, AD-76], and has a negative price impact at the announcement of the SEO. In other words, there is a significant increase in firm-information-related volatility, which negatively affects the abnormal returns at the announcement date of the SEO.

Furthermore, the results in Panels A and B of Table 3-14 suggest that whenever there is an increase in the cumulative abnormal returns between two time periods, [AD-150, AD-76] and [AD-75, AD-2] as reported in Tables 3-2 to 3-4, the mean abnormal returns at the announcement date will be positively related to the *CHCAR* and to *PreCAR* in the period [AD-75, AD-2] as reflected in the sample of cross-listed shares on NASDAQ for domestic SEOs. This result is not consistent with Masulis and Korwar (1986) and Korajczyk et al. (1990) who find a negative correlation between the abnormal returns at the announcement of equity offerings and the cumulative abnormal returns for shorter periods (60 and 100 days) prior to the announcements, respectively. Our findings are more in line with those of Asquith and Mullins (1986) and Korajczyk et al. for U.S. SEOs, the theoretical model of Viswanath (1993), and the empirical results for Canadian SEOs by Kryzanowski and Rakita (2000). However, the former empirical results are related to price run-ups for longer periods of time (one year or more preceding the announcement). In addition, the former two studies find that the shorter the price run-ups, the more negative is the market reaction to the equity offering. We do not find this result for our sample. Viswanath (1993) also predicts that, whenever a higher price run-up prior to the announcement date of an equity offering occurs, it will be correlated positively to the price impact at the announcement date because the market interprets such run-ups as signaling the existence of future projects with positive net present values.

With respect to the shares cross-listed on the NASDAQ and NYSE/AMEX for international seasoned offerings, all of the regressions are not significant based on the high probabilities of the F-values (see Panels A and B of Table 3-15). This implies that the cross-sectional variations in abnormal returns are random. That is, the explanatory variables do not bear any relationship to the abnormal returns for the international SEOs. Therefore, the reliability of the significance of the estimates for *OFFSIZE* and the other variables is questionable.[38]

[Please place Table 3-15 about here]

Thus, based on the results summarized in Tables 3-14 and 3-15, we fail to support the hypothesis that common determinants exist for the shares that are cross-listed on the NASDAQ and NYSE/AMEX for the domestic and international SEOs. Furthermore, since *OFFSIZE* is positive or not significant for the regressions examined herein, we find no evidence that the

[38] This result should be considered in the context of the relatively small sample number of announcements for the shares cross-listed on NASDAQ (16) and the NYSE/AMEX (26).

demand curves slope down for the Canadian cross-listed shares regardless of SEO geographic placement and listing U.S. exchange.

Tables 3-16 and 3-17 report the determinants of the abnormal returns at the issue date for the shares cross-listed on the NASDAQ and NYSE/AMEX for the domestic and international SEOs, respectively. The only variables that are significant for the shares cross-listed on the NASDAQ, as reported in Panel A of Table 3-16, are *OFFSIZE* and *CHCAR*. The estimated coefficients of *OFFSIZE* are negative and significant at the five percent levels in columns (2) and (4). Also, the estimated coefficients of *CHCAR* are negative and significant at the five percent level as reported in column (2), (4) and (6), respectively. Although sensitivity shifts for *CHCAR* (or *CHCAR*XY*) are positive and marginally significant in columns (2) and (4), the unreported estimated coefficients and p-values for the net effect of *CHCAR*XY* are negative and not significant. The unreported estimated coefficients (p-values) are –0.0159 (0.5678) and –0.0127 (0.7149), respectively, obtained from unreported regressions associated with columns (2) and (4). The unreported estimated coefficients for the net effect for the variable *ADAR* for the shares cross-listed on the NYSE/AMEX (or *ADAR*XY*) are positive and significant at the 5 and 10 percent levels, respectively. The net effect of the estimated coefficients of *ADAR*XY* (p-values) are 0.2434 (0.0102), 0.2655 (0.0129) and 0.1500 (0.0926), respectively, based on unreported regressions associated with columns (2), (4) and (6).

[Please place Table 3-16 about here]

Panel B of Table 3-16 reports that the significant variables associated with the abnormal returns at the issue date for the shares cross-listed on the NASDAQ are *OFFSIZE*, *PreCAR*, *ABVOL* and *TRADES*. *OFFSIZE* is negative and significant only at the ten percent level as displayed in column (4). The estimated coefficients of *PreCAR* are negative and significant at the one percent level as reported in columns (2), (4) and (6), respectively. The estimated coefficients of *ABVOL* and *TRADES* are positive and significant at the ten percent level as reported in columns (4) and (6), respectively. These results suggest that price run-ups, as proxied by *PreCAR*, have a negative impact on the abnormal returns at the issue date. In contrast, the positive estimated coefficients of *ABVOL* and *TRADES* suggest that they proxy for positive firm-information-related volatility, which is associated with positive abnormal returns at the issue date.

On the other hand, the sensitivity shift for the variable *ADAR*XY* is positive and significant at the ten percent level as reported in columns (2), (4) and (6). The unreported net effect of the estimated coefficients for the variable *ADAR*XY* is also positive and significant at the five percent level. The estimated coefficients (p-values) are 0.2434 (0.0102), 0.2655 (0.0129) and 0.2392(0.0220), which are associated with regressions reported in columns (2), (4) and (6), respectively. These results are consistent with those in Panel A of Table 3-16. That the estimated coefficient of *ADAR* is positive and significantly related to the abnormal returns at the issue date suggest possible underreaction by investors for the shares cross-listed on the NYSE/AMEX for the domestic SEOs. In contrast, *PreCAR* and *CHCAR* are negative and significantly related to the abnormal returns at the issue date, which suggests the possible overreaction by investors for the shares cross-listed on the NASDAQ.

With respect to the shares cross-listed on the NASDAQ and NYSE/AMEX for the international SEOs, no regressions are found to be significant based on the high probability of the F values, as reported in Panels A and B of Table 3-17. Therefore, the reliability of the significant estimates is dubious.

[Please place Table 3-17 about here]

Based on the results reported in Tables 3-16 and 3-17, the hypothesis that the common determinants of the abnormal returns at the issue date exists for the shares that are cross-listed on the NASDAQ and NYSE/AMEX for the domestic and international SEOs, respectively, is not supported. Furthermore, although *OFFSIZE* is found negative and significant for the shares cross-listed on the NASDAQ, other firm information variables are also significant. Therefore, no evidence exists to support the conjecture that the demand curves slope down for the Canadian cross-listed shares regardless of SEO geographic placement and U.S. listing exchange for the issue date.

Summarizing, the empirical results as reported in Tables 3-12 to 3-17 fail to support the hypotheses that common determinants for the abnormal returns exists for the domestic and international SEOs, and separately for the domestic and international SEOs for the shares cross-listed on the NASDAQ and NYSE/AMEX at the announcement (issue) date. Based on these results, we conclude that the expected determinants are idiosyncratic to the SEO geographic placement and U.S. cross-listing venue. What is striking is that in most regressions examined herein, the estimated coefficients of the offering size are positive and sometimes significant. This is puzzling since no theoretical or empirical studies about SEOs report similar evidence up until now (see Table 3-1). Also, this result fails to support any possible evidence that the demand curves for Canadian cross-listed shares for SEOs are downward sloping, assuming no information related effects are present at the announcement (issue) date.

The only result, which seems to fit the Viswanath (1993) model corresponds to the sample of domestic SEOs for the shares cross-listed on the NASDAQ at the announcement date. That is, the variables that are a statistically significant are *PreCAR* (+), *CHCAR* (+) and *TO* (+), which proxies for favorable (less) private information, and *ADG* (+) which proxy for favorable public information. The accumulation of positive (private and public) information prior to the announcement of domestic SEOs for the shares cross-listed on the NASDAQ appears to be taken by the market as a signal of future positive NPV projects. Firms appear to use such knowledge to float equity offerings that have minimum price impact.

3.7 CONCLUDING REMARKS

The issue of whether there are common determinants of abnormal returns at the announcement and issue date for seasoned equity offerings (SEOs) has been studied in the finance literature. We extend the literature by empirically examining whether common determinants of abnormal returns at the announcement and issue dates exist for the Canadian cross-listed shares of domestic and international SEOs, respectively, and for the Canadian shares that are cross-listed on the NASDAQ and NYSE/AMEX separately for the domestic and international SEOs. When interpreting our results, we address the subject of whether Canadian cross-listed shares have downward sloping demand curves.

Our main conclusion is that no common determinants exist for the abnormal returns at the announcement (issue) date for the sample of SEOs examined herein. Specifically, the variables (and the signs of their estimated coefficients) that are significant for the domestic SEOs for the Canadian cross-listed shares are *ADG* (+), *OFFSIZE* (+), *CHTO* (+), *CHABVOL* (-), and *CHABESPREAD* (-). Furthermore, if the SEO is a primary secondary equity offering, *DNS* (+) is also a significant determinant. Similarly, the variables that are significant for the international SEOs for the Canadian cross-listed shares are *ADB* (-), *DNS* (+), *TO* (+) and *ABVOL* (-). The qualitative variable *DNS* is the only variable that seems to be common for the domestic and international SEOs.

No common determinants are found for the abnormal returns at the issue date for the domestic and international SEO samples, respectively. The variables that are significant (and their signs) for the domestic SEOs are *CHCAR* (-), *PreCAR* (-), *TRADES* (+), *IDB* (-) and *TO* (+). *IDB* (+) is the only variable that is significant, but to a lesser extent, for the international SEOs.

No common determinants of the abnormal returns for the announcement and issue dates are identified for the Canadian shares cross-listed on the NASDAQ and NYSE/AMEX separately for the domestic and international SEOs. Particularly, the determinants (and their signs) of the abnormal returns at the announcement date for the domestic shares that are cross-listed on NASDAQ are *CHCAR* (+), *PreCAR* (+), *ADG* (+), *TO* (+) and to lesser extent *DNS* (+). Correspondingly, *OFFSIZE* (+), *CHTO* (+), *CHABVOL* (-), *CHABESPREAD* (-) and *DNS* (+) are the variables that are significant for the shares cross-listed on the NYSE/AMEX. With respect to the international SEOs, no regressions are significant. Therefore, the significant common determinants identified for the shares cross-listed in both the NASDAQ and NYSE/AMEX are unreliable.

In the same vein, no common determinants of the abnormal returns at the issue date are found for the Canadian shares cross-listed on the NASDAQ and NYSE/AMEX separately for the domestic and international SEOs. Specifically, the variables that are significant (and their signs) for the shares cross-listed on the NASDAQ for the domestic SEOs are *OFFSIZE* (-), *CHCAR* (-), *PreCAR* (-), *ABVOL* (+) and *TRADES* (+). Similarly, for the Canadian shares cross-listed on the NYSE/AMEX, the relevant variables (and their signs) are *ADAR* (+), *CHABESPREAD* (-), and to lesser extent *IDB* (-). A comparison of these results with those obtained for the same cross-listed shares at the announcement date and their association with abnormal returns suggests that investor overreaction (underreaction) for the shares that are cross-listed on the NASDAQ (NYSE/AMEX) occurs. That is, the variables change sign for the shares cross-listed on the NASDAQ at the issue date and are positively associated with the abnormal returns at the issue date (e.g., the abnormal returns at the announcement and issue dates for the shares cross-listed in NASDAQ are –2.5 and 3.66 percent, respectively). In contrast, investor underreaction seems to occur for the shares cross-listed on the NYSE/AMEX, since *ADAR* is positively and significantly related with the abnormal returns at the issue date. With respect to the determinants for the shares that are cross-listed on the NASDAQ and NYSE/AMEX for international SEOs, all regressions are not significant based on the F test. Therefore, any identified significant determinants are not reliable.

In short, the determinants of the abnormal returns at the announcement and issue dates for the Canadian cross-listed shares seem to be idiosyncratic to the SEO geographic placement and U.S. listing venue. Since the offering size as a determinant of abnormal returns at the announcement (issue) date is mostly positive in all the regressions analyzed herein, we fail to provide evidence supporting the hypothesis that the demand curves slope down for the samples of Canadian cross-listed share offerings examined herein. The only results that seem to support a model for the determinants of the abnormal returns at the announcement date are for the sample of domestic SEOs for the shares cross-listed on the NASDAQ. They seem to fit the Viswanath (1993) predictive model, in which prior share price run-ups signal positive information to the market about future projects with positive NPVs.

CHAPTER 4

DETERMINANTS OF UNDERWRITING FEES FOR DOMESTIC AND NON-DOMESTIC SEASONED EQUITY OFFERINGS BY CANADIAN CROSS-LISTED SHARES

4.1 INTRODUCTION

The significant determinants of underwriter fees for seasoned equity offerings (SEOs) vary across the numerous published studies.[39] Determinants are identified by offer type (firm commitment, shelf or not shelf registration), method of underwriter selection (negotiated or competitive), issuer industrial sector (industrials or utilities), underwriter type (commercial bank holding company or investment bank) and country of issue.[40] The determinants identified in most studies, and the signs of their estimated coefficients include the log of gross proceeds (-) and stock return volatility (+), as proxied by the standard deviation of returns.

To our knowledge, no study has analyzed whether the determinants of underwriting fees for SEOs differ for domestic and non-domestic issues by listing venue for shares cross-listed internationally. The purpose of this study is two-fold: first, to examine if the determinants of underwriter fees differ for domestic and non-domestic SEOs for Canadian shares cross-listed on the NYSE/AMEX or NASDAQ, and second, to test if the U.S. listing venue has an impact on underwriting fees after controlling for the effect of other relevant fee determinants.

We find that the determinants of underwriter fees differ for the domestic and non-domestic SEOs for Canadian issuers with shares cross-listed on the U.S. The log of gross proceeds, firm size, the volatility of stock returns, the relative size of the offering and the

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[39] Underwriter fees also are known as gross spreads, syndicate spreads, or underwriter commissions. Underwriting fees compensate the underwriter(s) for bearing price and distribution (inventory) risk at the time of the offering. We adhere to the Investment Dealers Association of Canada or IDA definition (see Syndicate Practices Handbook, 1996) of underwriter fee as referring to gross (%) spreads herein.
[40] This literature includes Hansen and Torregrossa (1992) and Bae and Levy (1996) for firm commitment SEOs, Bhagat, Marr, and Thompson (1985) for shelf and not shelf registration SEOs, Bhagat and Frost (1986) for negotiated versus competitive SEO deals, Eckbo and Masulis (1992) for rights offerings and the SEOs for industrials and utilities, Gande, Puri, and Sanders (1999), Roten and Mullineaux (2000) and Ursel (2000) for the type of underwriter (commercial bank holding company or investment bank), and Slovin et al. (2000) and Bühner and Kaserer (2000) for SEO flotation methods and country of issue placement.

overallotment option are the main determinants of underwriter fees for domestic SEOs, regardless of whether these Canadian issuers are cross-listed on the NYSE/AMEX or NASDAQ. In contrast, firm size, number of underwriters, type of equity (primary or secondary) offering,[41] and U.S. listing venue are the main determinants of underwriter fees for non-domestic SEOs issued by firms cross-listed on the U.S. After controlling for the other relevant determinants, underwriter fees are significantly higher for the non-domestic SEOs by issuers whose shares are cross-listed on NASDAQ compared to that on the NYSE/AMEX.

The remainder of the chapter is organized as follows. Section 4.2 examines the sample and data. Section 4.3 presents the hypothesis to be tested and describes the test methodology. The empirical results are reported and analyzed in section 4.4. Section 5 concludes the chapter.

4.2 THE SAMPLE AND DATA

The initial sample consists of 255 domestic and non-domestic seasoned (primary and secondary) equity offerings (SEOs) by Canadian issuers cross-listed on the NYSE, AMEX or NASDAQ, as identified using the National Post Data Group Database for the period 1993-1998. The total sample is reduced to 146 SEOs by eliminating 109 SEOs that were withdrawn or not completed, had no fees reported, were not included in the Canadian Financial Markets Research Centre (CFMRC) Database, or had no return data before the SEO announcement. The final sample of 146 SEOs (116 primary (PE) and 30 secondary equity offerings) includes 70 firm commitment (FC), 12 best efforts (BE) and 64 bought deals (BD).

Descriptive statistics for the total, domestic and non-domestic samples of SEOs for each year from 1993 to 1998 are reported in panels A, B and C, respectively, of Table 4-1. The descriptive statistics by year include the number of SEOs by issue location, issuer listing venue and type of underwriter commitment, and the mean values for the % fees, the dollar gross

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[41] Primary equity offering refers to the sale of new equity to the public by a firm (i.e., there is an increase in outstanding shares). In a secondary issue no new equity is sold to the public, only shares owned by the existent shareholders are sold to the public (i.e., the number of outstanding shares remains the same).

proceeds and issuer firm size. The monetary values are stated in Canadian dollars as of December 1998 based on the Canadian Consumer Price Index as reported by the Canadian Economic Observer.

[Please place Table 4-1 about here]

Of the 109 domestic SEOs, 57 and 52 are by Canadian issuers who are cross-listed on the NYSE/AMEX and NASDAQ, respectively. Of the 37 non-domestic SEOs, 23 and 14 are by firms cross-listed on the NYSE/AMEX and NASDAQ, respectively.[42] Except for 1994 when no non-domestic SEOs were floated, the SEOs exhibit no noticeable bunching by year for the total, domestic and non-domestic SEOs. Gross proceeds and firm size are consistently higher for non-domestic compared to domestic SEOs for all the years in which both types of offerings are made.

Table 4-2 reports the relative frequencies and mean fees, gross proceeds and firm sizes for various constant-dollar gross proceed categories for the total, domestic and non-domestic SEO samples. For most of the categories of gross proceeds, the underwriting fees are consistently higher for the non-domestic compared to the domestic SEOs. As Chen and Ritter (2000) find for U.S. SEOs, underwriting fees are not clustered at any specific percent.[43]

[Please place Table 4-2 about here]

4.3 HYPOTHESES AND TEST METHODOLOGY

The null hypothesis to be tested is that the determinants of underwriting fees do not differ for domestic and non-domestic SEOs and by U.S. listing venue for internationally cross-listed shares. We test this hypothesis by estimating the following relationship: [44]

[42] In the total sample of SEOs, there are only two simultaneous domestic and non-domestic issues. They are classified separately as domestic and non-domestic issues.
[43] In contrast, Chen and Ritter (2000) and Kryzanowski and Rakita (1999) find that fees for IPOs are clustered at seven percent (U.S.) and six percent (Canada), respectively.
[44] The model is also estimated using dummy variables to identify the terms of the SEO (i.e., firm commitment, best efforts or bought deal). None of the estimated regression coefficients for these dummy variables is significant.

$$FEE_i = \beta_0 + (\beta_1 + \lambda_{NASD} GLO) NASD_i + (\beta_2 + \lambda_{LnGP} GLO) LnGP_i + (\beta_3 + \lambda_{ME} GLO) ME_i + (\beta_4 + \lambda_{STD3} GLO) STD3_i + (\beta_5 + \lambda_{OFFSIZE} GLO) OFFSIZE_i + (\beta_6 + \lambda_{NOFFSC} GLO) NOFFSC_i + (\beta_7 + \lambda_{NU} GLO) NU_i + (\beta_8 + \lambda_{OAO} GLO) OAO_i + (\beta_9 + \lambda_{DNS} GLO) DNS_i + \varepsilon_i \quad (4\text{-}1)$$

where

FEE_i is the underwriter fee in percent for issue i, and is equal to $[(P^o - P^i)/P^o]*100$, where P^o is the price offered to the market and P^i is the price paid to the issuer firm for issue i.

$NASD_i$ is a dummy variable that indicates whether or not the shares of the issuer of issue i are cross-listed on NASDAQ. This dummy is equal to one if the shares are cross-listed on NASDAQ and is equal to zero if they are cross-listed on the NYSE/AMEX.

GLO_i is a dummy variable that is equal to one if issue i is a non-domestic seasoned offering, and zero otherwise.

$LnGP_i$ is the natural logarithm of gross proceeds for issue i (i.e., the dollar amount of the offering size), and is equal to the number of shares floated times the offering price. It does not include the amount associated with the exercise of any overallotment option since whether or not this option will be exercised is not known at the time of the offering.

ME_i is the market value (in billions of dollars) of the equity of the issuer of issue i. This proxy for firm size is measured by multiplying the offering price by the number of shares outstanding prior to the SEO announcement, as in Hansen and Torregrossa (1992).

$STD3_i$ is the standard deviation of daily stock returns for the shares of the issuer of issue i during the three months prior to the SEO announcement.[45] The volatility of stock returns is used as a measure of price uncertainty or price risk.

[45] The time periods used to measure daily return volatility range from two years (Ursel, 2000) to 20 days prior to the issue (Yeoman, 2001). Our time period is similar to that used by Bae and Levy (1990). We find that our results are robust when we measure the daily standard deviation of stock returns using the data for both the month and the six months prior to the announcement.

$OFFSIZE_i$ is the relative size of offer i as measured by the number of shares offered divided by the outstanding shares prior to the offering, as in Altinkilic and Hansen (2000), and Bae and Levy (1990).

$NOFFSC_i$ corresponds to the number of SEOs floated by the lead underwriter, where the number of non-domestic issues is adjusted to be comparable with those for domestic issues.[46] It is a proxy for underwriter prestige. This proxy is preferred over the dummy variable proxy used by Roten and Mullineaux (2000) and Ursel (2000) because our proxy captures more variability in underwriter reputation.

NU_i is the number of underwriters of Canadian issue *i* by issuer cross-listed on the U.S. This variable proxies for underwriter effort where a higher number of underwriters is associated with higher NU_i.

OAO_i is a dummy variable that is equal to one if issue i has an overallotment option and is zero otherwise.

DNS_i is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering.

The determinants, $LnGP_i$ and ME_i, are expressed in Canadian dollars as of December 1998 using the Canadian Consumer Price Index. Furthermore, unless stated otherwise, significance is measured throughout at the 5 percent level.

To simplify interpretation and exposition of the regression results, we also estimate the following equation that is obtained by replacing $NASD_i$ by $NYAM_i$ and GLO_i by DOM_i in equation (4-1):

[46] This is because the sample size is different for domestic (109) and non-domestic (37) SEOs; otherwise the $NOFFSC_i$ for non-domestic would be biased downwards. In addition, the underwriters that subscribe domestic issues are usually Canadian investment dealers and those who subscribe non-domestic issues are usually U.S. investment dealers. See the Appendix 4-A for the complete list of lead underwriters for the domestic and non-domestic Canadian SEOs, respectively.

$$FEE_i = \beta_0 + (\beta_1 + \lambda_{NYAM}DOM)\,NYAM_i + (\beta_2 + \lambda_{LnGP}DOM)LnGP_i + (\beta_3 + \lambda_{ME}DOM)\,ME_i + (\beta_4 + \lambda_{STD3}DOM)STD3_i + (\beta_5 + \lambda_{OFFSIZE}DOM)OFFSIZE_i + (\beta_6 + \lambda_{NOFFSC}DOM)\,NOFFSC_i + (\beta_7 + \lambda_{NU}DOM)NU_i + (\beta_8 + \lambda_{DNS}DOM)DNS_i + (\beta_9 + \lambda_{DNS}DOM)DNS_i + \varepsilon_i \quad (4\text{-}2)$$

where

$NYAM_i$ is a dummy variable that indicates whether or not the shares of the issuer of issue i are cross-listed on NYSE/AMEX. This dummy is equal to one if the shares are cross-listed in NYSE/AMEX and is equal to zero if they are cross-listed on the NASDAQ.

DOM_i is a dummy variable that is equal to one if issue i is a domestic seasoned equity offering and is zero otherwise.

All the other terms are as defined above.

The variable that captures the U.S. listing venue, $NASD_i$ or $NYAM_i$, is included to examine if the fixed portion of underwriting fees for non-domestic issues is significantly higher if the Canadian non-domestic SEO is for shares that are cross-listed on the NASDAQ compared to that on the NYSE/AMEX. This expectation is based on an extension of the imputed noncompetitive behavior of NASDAQ dealers for order handling to SEO underwritings during the 1993-1998 time period examined herein. Christie, Harris and Schultz (1994), amongst others, document the relatively higher costs for order handling by dealers on NASDAQ. Since gross proceeds is significantly higher for non-domestic issues, particularly for issuers cross-listed on NASDAQ, this variable may also proxy somewhat for gross proceeds.

The $LnGP_i$ variable is selected because it measures the impact of potential economies of scale to the investment dealer in placing larger issues. It is used in most empirical studies dealing with the determinants of underwriter fees and normally is negatively related to fee size (for a condensed review see Bühner and Kaserer, 2000).

To control for firm size, ME_i is included. Usually, the larger is the issue, the larger is the firm. Larger firms are associated with lower expected fees because larger firms are considered less risky. They are deemed to have less information asymmetry since they are closely followed by analysts and are more widely held. This is consistent with lower marketing and certification costs by the underwriter (Hansen and Torregrossa, 1992). On the other hand, as the issue size increases, underwriters may require larger fees to persuade wealthy or institutional investors to add additional same-firm shares to their already large holdings of the issuing firm (Merton, 1987). Additionally, larger issues usually result in larger price drops at the announcement date (Korajczyk et al., 1990).

The expectation is that fees and the relative size of the offering, $OFFSIZE_t$, are positively related. Larger quantities of shares offered relative to firm size may decrease the price of the outstanding shares. In turn, this increases the risk of the offering, and therefore the underwriter fee. In addition, the larger the issue, the more the need for the underwriter to support the issue and therefore the larger the gross spread or fee (Asquith and Mullins, 1986; Bae and Levy, 1990). This adheres to the concept of variable costs rising as more capital is raised, everything else held equal, and supports the notion of U-shaped fees (Altinkilic and Hansen, 2000).

The relationship between fees and return volatility, as measured by the prior standard deviation of returns or $STD3_t$, is expected to be positive. Higher return volatility should increase the risk of the offering, and therefore increase the required underwriter compensation. In other words, higher standard deviations of returns increase the possibility that the underwriters may face higher price risk at the time of and after the offering, so that they have to liquidate their long positions at market prices that are lower than the offered prices. This variable is identified as a significant determinant of fees in most studies. The expectation is that fees are positively related with the quality of the underwriter because higher quality underwriters certify, market and monitor more credibly seasoned offerings (Chemmanur and Fulghieri, 1994).

The expected coefficient of the number of underwriters is expected to be positive. This assessment is based on empirical findings for IPOs. For example, Chung, Kryzanowski and Rakita (2000) find that, when a higher effort in issue marketing and distribution is needed for Canadian IPOs, the underwriter group needs to be compensated accordingly with higher fees.

The relationship between the inclusion of an overallotment option and fees is undetermined. Ellis, Michaely and O'Hara (2000) argue that, if the market is 'hot' for IPOs, a higher possibility exists that the underwriter will exercise the overallotment option to increase its total fee revenues. They also add that, since the *OAO* reduces inventory risk, a lower percent underwriter fee is expected. On the other hand, the issuer may be willing to pay higher fees to obtain higher total proceeds by granting the *OAO* to the underwriter as an incentive to oversell the issue (Pichler and Wilhelm, 2001). Ritter (1998) claims that the *OAO* may serve as a signal or marketing device to convince investors that the issue is not overpriced. Assuming that the signal is credible, then the issuer is willing to compensate the underwriter with higher fees.

The relationship between fees and type of offering (primary or secondary) is an empirical issue. Although intuitively it is expected to be positive in both cases, the impact of both types of offerings may not be similar when considering domestic and non-domestic SEOs for cross-listed shares. Both types of issues may be perceived differently by investors who trade domestic issues in the Canadian market relative to those who trade non-domestic issues in U.S. markets. Thus, the relationship between fees and type of offering may be positive (positive or negative) and significant (non-significant or significant) for the type of offering that is perceived as having the higher (lower) information asymmetry by investors.[47]

The means and medians of the fees and ex-ante determinants for the total, domestic and non-domestic samples of SEOs, and the p-values of the differences in the means and medians for the domestic and non-domestic samples of SEOs are reported in Table 4-3. Based on columns (1) through (4), the mean fees of 4.44 percent for the total sample of SEOs is lower than the mean

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[47] Asquith and Mullins (1986) and Korajczyk et al (1990) find a lower price impact for secondary relative to primary equity offerings at the announcement date. This may suggest the existence of lower information asymmetry for SEOs. Myers and Majluf (1984) suggest that firms use primary equity offerings when the value of growth opportunities is higher relative to the assets in place discounted by the possible negative price effects of such issues. Viswanath (1993) and Cooney and Kalay (1993) find that a non-negative price impact of equity offerings may arise from positive firm information. The likelihood of these results is higher for issues where investors are more likely to be better informed (i.e., for domestic issues), as implied by the investor recognition model of Merton (1987).

fees of 5.44 percent for U.S. SEOs, as reported by Lee, Lochhead and Ritter (1996). The mean (median) fees of 4.32 (4.00) percent for the domestic SEOs is significantly lower than the corresponding values of 4.82 (4.75) percent for the non-domestic SEOs. The mean gross proceeds (firm size) of $89.4 ($856.7) million for the domestic SEO is also statistically smaller than the corresponding values of $201.0 ($1,566.6) for the non-domestic SEOs. Similar inferences are drawn using the medians, which have smaller values than the means. In contrast, the mean number of underwriters of 2.85 for the domestic SEOs is higher and marginally significant compared to the corresponding value of 2.29 for the non-domestic SEOs. No statistically significant differences are found in both the means and medians for return volatility, *STD3*, the relative size of the offering, *OFFSIZE*, and the proxy for underwriter reputation, *NOFFSC*, for the domestic and non-domestic SEO samples.

[Please place Table 4-3 about here]

Similar statistics are reported by U.S. listing venue (NYSE/AMEX and NASDAQ) for the domestic and non-domestic SEOs in columns (5) through (7) and (8) through (10), respectively. Approximately the same numbers of issuers of domestic SEOs are cross-listed on the NYSE/AMEX (57) as on NASDAQ (52). Based on column (7) of Table 4-3, the mean and median differences for fees and most of the fee determinants are statistically significant. The exceptions include the mean difference for *STD3*, and both the mean and median differences for *NOFFSC* and *NU*. The mean and median values of *FEE*, *STD3* and *OFFSIZE* are statistically lower for the domestic SEOs by Canadian issuers with shares cross-listed on the NYSE/AMEX relative to those cross-listed on the NASDAQ (except for the mean of *STD3* which is significant only at the 10 percent level). Gross proceeds (*GP*) and firm size (*ME*) are significantly larger in value for the domestic SEOs by Canadian issuers with shares cross-listed on the NYSE/AMEX relative to those cross-listed on the NASDAQ.

Based on column (10) of Table 4-3, the mean and median differences for fees and all fee determinants are statistically significant. The mean and median values of *FEE*, *STD3* and

OFFSIZE are significantly lower for the non-domestic SEOs of issuers with shares cross-listed on the NYSE/AMEX relative to those cross-listed on the NASDAQ. The mean and median values of *GP*, *ME*, *NOFFSC* and *NU* are significantly higher for the non-domestic SEOs of Canadian issuers with shares cross-listed on the NYSE/AMEX relative to those cross-listed on the NASDAQ.

4.4 EMPIRICAL RESULTS

The regression results for the estimations of equations (4-1) and (4-2) are reported in Table 4-4.[48] Based on their F-values, the two regressions are statistically significant. The explanatory power (as measured by the R-square value) is equal to 0.47 for both regressions.

[Please place Table 4-4 about here]

To assess if the determinants are the same for the domestic and non-domestic SEOs, equation (4-1) uses the dummy variable *GLO* to determine the marginal impact of non-domestic SEOs on the individual slope coefficients for the fee determinants of domestic SEOs. Equation (4-2) uses the dummy variable *DOM* to assess the marginal impact of domestic SEOs on the individual slope coefficients for the fee determinants of the non-domestic SEOs. The regression results for equations (4-1) and (4-2) are reported in columns (1) and (2) of Table 4-4, respectively.

The estimated constants of 4.6899 and 5.0916 percent reported in columns (1) and (2) of Table 4-4 for equations (4-1) and (4-2), respectively, are both significant. The estimated coefficient of the constant change dummy (β_1) for undifferentiated SEOs by issuers cross-listed on NASDAQ is positive (0.2240) but insignificant (p-value of 0.1045). The estimated coefficient of the constant change dummy for non-domestic SEOs by issuers cross-listed on NASDAQ is

[48] To examine the stability of the coefficient estimates, the regressions also are run using each independent variable until all the ex-ante determinants are included. Based on unreported results, the estimates of the coefficients for the two types of regressions, which are estimated with and without dummies, do not change significantly.

both positive (0.9217) and significant (p-value of 0.0007). The estimated coefficient of the constant change dummy for undifferentiated SEOs by issuers cross-listed on NYSE/AMEX is negative (-1.0484) and significant (p-value of 0.0000). The estimated coefficient of the constant change dummy for domestic SEOs by issuers cross-listed on NYSE/AMEX is both positive (0.8243) and significant (p-value of 0.0028). These results suggest that the fixed portion of underwriter fees is significantly higher (lower) for non-domestic versus domestic SEOs for Canadian issuers whose shares are cross-listed on NASDAQ (NYSE/AMEX), and that the fixed portion of underwriter fees is significantly lower (higher) for non-domestic SEOs for Canadian issuers whose shares are cross-listed on NYSE/AMEX (NASDAQ).

The estimated coefficient of the log of gross proceeds, *LnGP*, is negative (-0.3721) and significant (p-value of 0.0000) for domestic SEOs, and negative (-0.0884) but not significant (p-value of 0.4366) for non-domestic SEOs. The estimated coefficient of the log of gross proceeds times the dummy variable used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant, *LnGP*GLO*, is both positive (0.2118) and marginally significant (p-value of 0.0745). Thus, the stylized inverse relationship between underwriter fees and gross spreads is significantly negative only for domestic SEOs, and is significantly less negative for non-domestic versus domestic SEOs for the sample studied herein.

The estimated coefficient of the market value of equity, *ME*, is positive (0.0001) and significant (p-value of 0.0171) for domestic SEOs, and is negative (-0.0003) and significant (p-value of 0.0000) for non-domestic SEOs. The estimated coefficient of the market value of equity times the dummy variable used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant, *ME*GLO*, is both negative (-0.0004) and significant (p-value of 0.0000). Thus, a significant positive (negative) relationship exists between underwriter fees and market value of equity for domestic (non-domestic) SEOs, and the relationship is significantly different for domestic versus non-domestic SEOs.

The estimated coefficient of the return volatility, *STD3*, is positive (13.9554) and significant (p-value of 0.0219) for domestic SEOs, and is positive (13.9554) but insignificant (0.4744) for non-domestic SEOs. The estimated coefficient of the return volatility times the dummy variable used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant is negative (-15.4573) but only marginally significant (p-value of 0.0899). Thus, fees and return volatility are positively and significantly related only for domestic SEOs.

The estimated coefficient of the relative size of the offering, *OFFSIZE*, is positive (0.7304) and significant (p-value of 0.0102) for domestic SEOs, and negative (-0.7727) but not significant (p-value of 0.2937) for non-domestic SEOs. The estimated coefficient of the relative offer size times the dummy variable used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant, *OFFSIZE*GLO*, is negative (-1.5892) and significant (p-value of 0.0350). Thus, the relationship between underwriter fees and relative offer size is only significant relationship for domestic SEOs, and is significantly different for domestic versus non-domestic SEOs for the sample studied herein.

The estimated coefficient of the proxy for underwriter prestige, *NOFFSC*, is positive but insignificant (p-values of 0.4939 and 0.5097) for the domestic and non-domestic SEOs, respectively. The estimated coefficient of underwriter prestige times the dummy variable used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant, *NOFFSC*GLO*, is negative (-0.0065) but insignificant (p-value of 0.7186). Thus, no significant relationship exists between underwriter fees and underwriter prestige even if SEOs are differentiated by location of issue as being domestic or non-domestic.[49]

The estimated coefficient of syndicate size, *NU*, is positive (0.0007) but insignificant (p-value of 0.9840) for domestic SEOs, and positive (0.3329) and significant (p-value of 0.0000) for non-domestic SEOs. The estimated coefficient of the syndicate size times the dummy variable

[49] The market share of the lead underwriter as a proportion of total proceeds, for both domestic and non-domestic issues for the sample period 1993-1998, was also used as a proxy for underwriter prestige. No significant results were found for this measure.

used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant, *NU*GLO*, is positive (0.3304) and significant (p-value of 0.0000). Thus, a significant (and positive) relationship between underwriter fees and syndicate size exists only for non-domestic SEOs, and the relationship between underwriter fees and syndicate size is significantly different for domestic versus non-domestic SEOs.

The estimated coefficient of the overallotment option dummy, *OAO*, is positive (0.3563) and significant (p-value of 0.0264) for domestic SEOs, and is positive (0.2914) but not significant (p-value of 0.1506) for non-domestic SEOs. The estimated coefficient of the overallotment option times the dummy variable used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant is negative (-0.1647) but insignificant (p-value of 0.5138). Thus, the relationship between underwriter fees and the inclusion of an overallotment option is significant (and positive) only for domestic SEOs.

The estimated coefficient of the dummy for primary offerings, *DNS*, is positive (0.0912) but not significant (p-value of 0.6910) for domestic SEOs, and is positive (0.2529) and marginally significant (p-value of 0.0560) for non-domestic SEOs. The estimated coefficient of the dummy variable for primary equity offering times the dummy variable used to capture the marginal impact on fees of non-domestic SEOs for this fee determinant is positive (0.1363) but insignificant (0.5875). Thus, the relationship between underwriter fees and the type of the offering (primary) is significant (and positive) only for non-domestic SEOs.

Thus, the log of gross proceeds, *LnGP*, firm size, *ME*, the standard deviation of returns, *STD3*, offer size, *OFFSIZE* and the inclusion of an overallotment option, *OAO*, are significant determinants of underwriter fees for our sample of domestic SEOs by Canadian issuers with shares cross-listed in U.S. markets. The estimated signs for *LnGP*, *STD3* and *OFFSIZE* are consistent with the findings of Bae and Levy (1990) and Eckbo and Masulis (1992). A possible explanation for the positive relationship between fees and firm size may be due to the difficulty of selling domestic SEOs of larger Canadian firms into the domestic Canadian market because of their relatively high proportion of market capitalization relative to the average firm in the Canadian stock market. In addition, targeted large investors (such as pension funds) may already hold a significant proportion of the share float of these firms in their investment portfolios (i.e., less portfolio diversification). This conjecture is consistent with the predictions of the Merton (1987) model, in which a higher weight on the same stock should be associated to a higher expected return. Thus, underwriters may require higher compensation for issues by larger Canadian issuers for domestic SEOs. The positive relationship between underwriter fees and the inclusion of an overallotment option is consistent with the findings for Canadian IPOs by Chung et al (2000). It also is consistent with the argument by Pichler and Wilhelm (2001) and Ritter (1998) that higher fees paid to the investment bank may be more than compensated by the successful sale of a larger issue (measured in terms of net proceeds to the issuer).

A possible reason for the non-significance of *NOFFSC* is that relatively little information asymmetry needs to be resolved by the investment dealer for SEOs compared to IPOs (where fees are higher). Cross-listed SEO issuers generally have a well-known trading history, and are often followed by a large number of analysts. As a result, there is much less need for high certification and monitoring (and therefore for higher underwriter reputation), as is the case for IPOs (McLaughlin, Safieddine, and Vasudevan, 2000).[50,51] The insignificance of syndicate size, *NU*, as a determinant of underwriter fees is consistent with the findings of Chung et al (2000) for Canadian IPOs.

In contrast, market value of equity, *ME*, syndicate size, *NU*, and type of offering (*primary*) and U.S. listing venue, *NYAM*, are significant determinants of underwriter fees for our

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[50] Ursel (2000) finds that underwriter prestige is negatively related to fees and is not statistically significant. Roten and Mullineaux (2000) find that, counter to a priori expectations, the coefficient of underwriter prestige is negative and statistically significant. Bae and Levy (1990) use the number of lead managing underwriters as a proxy for underwriter prestige. They find that the estimated coefficient of this variable is positive and statistically significant but highly correlated with the size of the offering. Based on the unreported correlation matrix, this is not the case herein.

[51] Kryzanowski and Rakita (2001) find that underwriter reputation is marginally significant as a determinant of underwriter fees for Canadian IPOs.

sample of non-domestic SEOs by Canadian firms cross-listed in U.S. markets. This result indicates that the variable portion of underwriter fees for non-domestic SEOs by Canadian issuers with shares cross-listed on the U.S. decreases with increasing firm size, increases with syndicate size, and increases if the issue is a primary offering. The fixed portion of underwriting fees is lower for shares cross-listed on the NYSE/AMEX compared to that for the NASDAQ, all else held equal.

A number of separate unreported regressions are run to test for the robustness of the findings reported above. When the dummies for exchange and for the dummy for exchange times the dummy *GLO* are omitted, the estimated coefficients of *LnGP*, *STD3* and *OAO* become significant with their expected signs for the non-domestic SEOs, and the estimated coefficient of *DNS* becomes insignificant. This suggests that the exchange dummy captures the impact of these variables on underwriter fees for non-domestic SEOs. To further assess the impact of the NASDAQ and the NYSE dummies, we first regress the dummy *NASD*GLO* on the variables, *LnGP*GLO*, *ME*GLO*, *STD3*GLO*, *OAO*GLO* and *DNS*GLO*. We then regress the dummy *NYAM* on the same independent variables. Except for *ME*GLO*, the estimated coefficients for the regressions are all significant but with opposite signs. Specifically, the coefficients for the determinants of *NASD*GLO* (*NYAM*) are - (+) for *LnGP*, + (-) for *STD3*GLO*, + (-) for *OAO*GLO* and – (+) for *DNS*GLO*. The results for *STD*GLO* and *OAO*GLO* suggest that the dummy variable *NASD* (*NYAM*) is a proxy for higher (lower) risk so that higher (lower) relative underwriter fees are required. On the other hand, the larger the *LnGP*, the less likely the SEO is non-domestic for an issuer cross-listed in *NASD* compared to *NYAM*. Similarly, primary (secondary) offerings are less (more) likely to be floated on the *NASD* (*NYAM*). This is consistent with the empirical finding that larger issues are more likely to be primary than secondary, and are more likely to floated for firms cross-listed on NYSE/AMEX than on NASDAQ.[52]

Based on these findings, it is less costly to raise non-domestic equity for same-size firms with shares cross-listed on the NYSE/AMEX than for those cross-listed on the NASDAQ. Why this occurs is a subject left for future investigation.

4.5 CONCLUDING REMARKS

It is well documented that the empirical determinants of underwriter fees (gross spreads) differ somewhat across various samples. Determinants generally identified as being significant are the characteristics of the issue (types and terms of the offering) and the issuer (size, risk and so forth), the type of underwriter (bank-owned underwriter or independent investment bank), and country of issue placement.

This paper makes an important contribution to the existing empirical literature by analyzing the determinants of the underwriter fees for both domestic and non-domestic seasoned equity offerings (SEOs) by Canadian issuers whose shares are cross-listed on the NYSE/AMEX and NASDAQ. The significant determinants of the variable portion of underwriter fees and their signs for our sample of domestic SEOs are the natural log of gross proceeds (-), the size of the firm or market equity capitalization (+), the standard deviation of prior returns (+), the relative size of the offering (+) and the inclusion of an overallotment option (+). The significant determinants of the variable portion of underwriter fees and their signs for our sample of non-domestic SEOs are firm size (-), syndicate size (+) and if the issue is a primary (not a secondary) offering (+). The fixed portion of underwriter fees are significantly higher for non-domestic versus domestic SEOs for Canadian issuers whose shares are cross-listed on NASDAQ versus the NYSE/AMEX, and are significantly higher for non-domestic SEOs for Canadian issuers whose shares are cross-listed on NASDAQ versus the NYSE/AMEX.

[52] The correlation matrix and these regression results are available upon request.

These results clearly indicate that the determinants of underwriter fees are dependent on whether the SEO is domestic or non-domestic, and on the U.S. listing venue where the foreign shares are cross-listed. Our findings are robust since we control for the same explanatory variables for both types of SEOs. Our findings appear to unambiguously demonstrate that the same common determinants of SEO underwriter fees do not exist internationally, at least for the domestic and non-domestic SEOs for our sample of Canadian issuers whose shares are cross-listed on the U.S. Further study is warranted since the possibility remains that one or more important explanatory variables are missing from the empirical evidence presented herein.

CHAPTER 5

CONCLUDING REMARKS AND VENUES FOR FUTURE RESEARCH

This thesis contributes to the finance literature by its empirical analyses of various aspects for Canadian shares cross-listed on the TSE and in the NYSE, AMEX and NASDAQ. Particularly, it extends the literature by studying the trading behavior of Canadian shares cross-listed on the TSE and on the U.S. primary trade venues, and also by studying issues that have been neglected previously, such as the study of Canadian seasoned offerings placed internationally. The main aspects of the three chapters examined in this thesis together with their major findings are presented next. This is followed by a discussion of directions for future research.

5.1 Major Findings

Whether an international trade-venue clientele effect exists for Canadian shares cross-listed in the United States was examined in chapter 2. Our major finding is that the TSE has consistently lost its share of executed order flow (share turnover) relative to the U.S. primary trade venues, and that this loss is associated with an increased relative trade cost on the TSE. We find that holding periods (effective half-spreads) for share trades executed on the U.S. trade venues significantly decreased over time relative to investor holding periods (effective spreads) for the same-firm share trades executed on the TSE, primarily for the period after the TSE decimalization. This contrasts with prior studies that report that TSE decimalization did not have a significant impact on trade liquidity.[53] This finding is corroborated with the findings from Granger causality tests that trade volume significantly causes trade costs (relative effective spreads) for all the samples of Canadian cross-listed shares analyzed herein. Since the data studied is for the 1993-1998 period, we do not know if the negative trend of decreasing trade

[53] For example, see Chung et al. (1996), Bacidore (1997), Ahn et al. (1998), and McKinnon and Nemiroff (1999).

volume on the TSE relative to the trade volume for the same-firm shares on the U.S. for Canadian cross-listed shares has worsened since 1997. During mid-1997, the NYSE, AMEX and NASDAQ lowered their tick sizes on most stocks from eighths to sixteenths, and subsequently on January and March 2001, the NYSE and NASDAQ converted all their issues to decimalization, respectively (Chung, Van Ness, and Van Ness, 2001).

The determinants of the price impact at the announcement and issue dates for domestic and international seasoned primary and secondary equity offerings (SEOs) for Canadian shares cross-listed on the TSE and on the NYSE/AMEX and NASDAQ were studied in chapter 3. In this chapter, we also analyzed whether the determinants are the same for shares cross-listed on the NYSE/AMEX and NASDAQ for domestic and international SEOs. For all of the samples studied, different determinants are identified for the announcement date relative to the issue date, and for the announcement (issue) date for domestic and international SEOs. Different private (firm specific) and public information related variables are systematically found to explain the abnormal returns observed at the announcement (issue) date, and this observation is strongest for the samples of domestic Canadian SEOs analyzed herein. These results indicate that the determinants of the market reaction at the announcement (issue) date for the SEOs of Canadian cross-listed shares are unambiguously dependent on the SEO placement location and cross-listing U.S. trade venue.

Interestingly, offer size is positively related to abnormal returns for most samples. Thus, our evidence does not support the notion that the demand curves slope down for the samples of Canadian SEOs examined herein. The Viswanath (1993) model seems to explain the lower non-significant market reaction at the announcement date for the Canadian equity offerings for the shares cross-listed on the NASDAQ. Specifically this model predicts that a positive market reaction may be associated with firms with price run-ups prior to the announcement of the SEOs, which the market interprets as indications of future investment projects with positive net present values. This finding is consistent with the notion that growth firms populate the NASDAQ.

The determinants of underwriter fees for domestic and non-domestic SEOs by Canadian shares cross-listed on the TSE and on the NYSE/AMEX and NASDAQ were studied in chapter 4. Gross proceeds, firm size, return volatility, relative size of the offering and the inclusion of an overallotment option are identified as the determinants of fees for domestic SEOs. In contrast, firm size, number of underwriters, type of offering and U.S. listing venue are identified as the determinants of underwriting fees for non-domestic SEOs. After controlling for differences in other relevant determinants, underwriter fees for non-domestic SEOs are significantly higher for Canadian shares cross-listed on the NASDAQ compared to those cross-listed on the NYSE/AMEX.

These results unambiguously show that the determinants of underwriter fees are dependent upon SEO geographic placement and U.S. listing venue. This is a similar finding to that reported in chapter 3 for the determinants of the abnormal returns of Canadian SEOs. This finding is consistent with most documented studies that find that transaction costs are higher for firms listed on the NASDAQ relative to firms with similar characteristics listed in the NYSE.[54]

5.2 Future Research Venues

Extensions to chapter 2 include an examination of the period from the beginning of 1998 to the end of 2001, in order to examine the impact of the NASDAQ and NYSE decimalization that occurred in full on April 2001 to assess if the TSE has continued to lose market share to the U.S. trade venues for its cross-listed shares. Additionally, it would be relevant to investigate the impact on trading volume, return volatility, trade costs and other microstructure variables if the TSE formed a strategic alliance or merged with the NYSE. Under this scenario, non-Canadian

[54] Issue 1 of volume 45 of the *Journal of Financial Economics* is devoted exclusively to an examination of the NASDAQ case. More recently, Chung et al. (2001) find that the trade costs for a sample of firm listed on NASDAQ are still higher than a similarly matched sample of shares traded on the NYSE after the NASDAQ and NYSE decimalizations in 2001. Aggarwal and Angel (1997) develop an interesting model of why firms prefer to cross-list on NASDAQ rather than the alternative exchanges such as the AMEX or NYSE, although the trade costs are higher on NASDAQ.

firms that trade on the NYSE would also trade on the TSE (or 'TSE-NYSE'). This important issue could be addressed using predictive and simulation modeling, similar to the model developed by Harris (1994). This model allegedly has successfully predicted the effects of the reduction of the minimum price increments implemented by the TSE, the Stockholm Stock Exchange and major U.S. exchanges on stock market liquidity.[55]

The non-significant relationships identified between abnormal returns and their expected determinants reported in chapter 3 for the non-domestic SEOs, primarily for the shares cross-listed on the NYSE/AMEX and NASDAQ, may be due to a small sample size of only 42 non-domestic SEOs. Thus, the testing should be revisited using a larger sample of Canadian non-domestic SEOs.

Another topic that would be interesting to pursue in future work is to include determinants such as joint-firm specific events that occur prior to the announcement of the SEOs, such as reports on or the trading behavior of insiders (John and Mishra, 1990), and analyst forecast dispersion and earnings announcements (Richardson, 1998). These joint event variables may capture credibly the type of private information that is being conveyed to the market prior to the announcement of the SEOs. Normally, earnings announcements, dividend announcements and stock splits are considered to be possible predictors of equity offerings, since they may decrease the information asymmetry and therefore smooth the negative price reaction of the announcement of the issue. However, in the study by Guo and Mech (2000), firm-specific information event variables only predict 4% of their sample of SEOs, and are not related to the market reaction at the announcement date.

Why the underwriting fees for non-domestic SEOs for shares cross-listed on the TSE and on the NASDAQ are much higher than those for the shares cross-listed on the TSE and on the NYSE/AMEX could be studied. Aggarwal and Angel (1997) argue that (smaller) firms prefer to

[55] Goldstein and Kavajecz (2000) cite various empirical studies that confirm the predictions of Harris (1994).

list on NASDAQ because of its marketing and visibility advantage, which more than compensates for the higher trade costs incurred on NASDAQ. However, this is unlikely to be the reason why these firms also pay higher size-adjusted underwriting fees for their seasoned offerings.

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Appendix 3-A

List of the 116 Domestic Seasoned Equity offerings on the TSE by Canadian cross-listed shares on the NYSE, AMEX and NASDAQ over the period from 1993 to 1998. The number and percentage of total offerings by year are: 36 offerings (31.0%) in 1993, 15 offerings (12.9%) in 1994, 11 offerings (9.5%) in 1995, 12 offerings (10.3%) in 1996, 20 offerings (17.2%) in 1997, and 22 offerings (19.0%) in 1998.

Year	Announcement No.	TSE Ticker	Announcement Date	Issue Date[a]	Cross-listed in
1993	1	BCB	4-Feb-93	9-Mar-93	NASDAQ
	2	MX	4-Feb-93	22-Feb-93	NASDAQ
	3	CN	11-Feb-93	25-Feb-93	NASDAQ
	4	GLG	18-Feb-93	18-Feb-93	NYSE
	5	MLT	18-Feb-93	16-Mar-93	NYSE
	6	SU	5-Apr-93	5-Apr-93	NYSE
	7	ENL	8-Apr-93	9-Jul-93	NYSE
	8	ENL	28-Apr-93	31-May-93	NYSE
	9	SU	30-Apr-93	21-May-93	NYSE
	10	GSC	25-May-93	25-May-93	AMEX
	11	TLM	18-Jun-93	21-Jun-93	NYSE
	12	K	26-Jun-93	8-Jul-93	NYSE
	13	NII	28-Jun-93	28-Jun-93	NASDAQ
	14	IQI	30-Jun-93	30-Jun-93	NYSE
	15	W	30-Jun-93	13-Jul-93	NYSE
	16	ECO	8-Jul-93	14-Jul-93	AMEX
	17	TGO	9-Jul-93	20-Jul-93	NYSE
	18	K	22-Jul-93	7-Oct-93	NYSE
	19	MXP	26-Jul-93	20-Aug-93	AMEX
	20	MLT	28-Jul-93	25-Aug-93	NYSE
	21	A	12-Aug-93	8-Sep-93	NYSE
	22	ENL	18-Aug-93	31-Aug-93	NYSE
	23	LWN	26-Aug-93	23-Sep-93	NYSE
	24	PNT	26-Aug-93	10-Sep-93	NASDAQ
	25	MB	9-Sep-93	30-Sep-93	NASDAQ
	26	POT	9-Sep-93	27-Sep-93	NYSE
	27	TEO	17-Sep-93	30-Nov-93	NASDAQ
	28	CN	22-Sep-93	23-Nov-93	NASDAQ
	29	FLY.B	29-Sep-93	23-Nov-93	NASDAQ
	30	RPC	2-Nov-93	16-Nov-93	NASDAQ
	31	JN	8-Nov-93	6-Dec-93	NASDAQ
	32	BRA	10-Nov-93	3-Dec-93	NASDAQ
	33	RIC	18-Nov-93	10-Dec-93	AMEX
	34	TEK.B	13-Dec-93	31-Dec-93	AMEX
	35	PDI	14-Dec-93	31-Dec-93	NYSE
	36	N	16-Dec-93	18-Jan-94	NYSE
1994	1	FSV	21-Jan-94	3-Feb-94	NASDAQ
	2	AAC.A	4-Feb-94	3-Mar-94	NASDAQ
	3	MLT	9-Mar-94	31-Mar-94	NYSE
	4	LAN	10-Mar-94	21-Mar-94	NASDAQ
	5	MAE	11-Mar-94	7-Apr-94	NASDAQ
	6	A	22-Mar-94	18-Apr-94	NYSE
	7	ITW	16-May-94	7-Jun-94	NYSE
	8	K	18-May-94	16-Jun-94	NYSE
	9	LWN	6-Jul-94	4-Aug-94	NYSE
	10	CID	12-Jul-94	5-Aug-94	AMEX

	11	UDI	17-Aug-94	6-Sep-94	NYSE
	12	NCT	28-Nov-94	15-Dec-94	NYSE
	13	LAN	1-Dec-94	15-Dec-94	NASDAQ
	15	PAA	31-Dec-94	31-Dec-94	NASDAQ
1995	1	DXX	10-Feb-95	23-Feb-95	NASDAQ
	2	PNT	4-Apr-95	26-Apr-95	NASDAQ
	3	K	17-May-95	6-Jun-95	NYSE
	4	MLT	24-May-95	13-Jun-95	NYSE
	5	TEK.A	20-Jun-95	6-Jul-95	AMEX
	6	CRW	28-Jun-95	6-Jul-95	NASDAQ
	7	BLD	11-Aug-95	29-Aug-95	NASDAQ
	8	PL	15-Aug-95	29-Aug-95	NASDAQ
	9	CN.B	18-Oct-95	8-Nov-95	NASDAQ
	10	NCT	17-Nov-95	12-Dec-95	NYSE
	11	K	9-Jan-96	31-Jan-96	NYSE
1996	1	LWN	4-Mar-96	20-Mar-96	NYSE
	2	LQW	8-Mar-96	29-Mar-96	NASDAQ
	3	PD	15-Mar-96	29-Mar-96	NYSE
	4	NCT	15-Apr-96	30-Apr-96	NYSE
	5	TEK.B	23-Apr-96	23-Apr-96	AMEX
	6	TLM	1-May-96	30-May-96	NYSE
	7	SDI	27-May-96	2-Jul-96	NASDAQ
	8	AEC	13-Jun-96	9-Jul-96	NYSE
	9	NCT	16-Sep-96	30-Sep-96	NYSE
	10	G.A	16-Oct-96	5-Nov-96	NYSE
	11	PNT	28-Oct-96	13-Nov-96	NASDAQ
	12	GLG	14-Nov-96	5-Dec-96	NYSE
1997	1	ALG	27-Jan-97	18-Feb-97	NASDAQ
	2	NCT	19-Feb-97	11-Mar-97	NYSE
	3	IMX	20-Feb-97	12-Mar-97	NASDAQ
	4	VEN	25-Feb-97	18-Mar-97	NASDAQ
	5	DMM.A	6-Mar-97	10-Apr-97	AMEX
	6	ADL	13-Mar-97	13-Mar-97	NASDAQ
	7	TLC=LZR	20-Mar-97	27-Mar-97	NASDAQ
	8	GSC	24-Apr-97	5-May-97	AMEX
	9	TSM.A	29-Apr-97	5-Jun-97	NASDAQ
	10	IMX	4-Jun-97	20-Jun-97	NASDAQ
	11	FTM	12-Jun-97	27-Jun-97	NASDAQ
	12	LDM	16-Jun-97	2-Jul-97	NYSE
	13	PNT	3-Sep-97	29-Sep-97	NASDAQ
	14	PNT	4-Sep-97	29-Sep-97	NASDAQ
	15	FLY.A	5-Sep-97	25-Sep-97	NASDAQ
	16	TEO	11-Sep-97	30-Sep-97	NASDAQ
	17	FTM	19-Sep-97	30-Sep-97	NASDAQ
	18	GRE	1-Oct-97	21-Oct-97	NASDAQ
	19	MWK	7-Oct-97	21-Oct-97	NASDAQ
	20	AAC.A	17-Oct-97	5-Nov-97	NASDAQ
1998	1	CBJ	19-Jan-98	3-Feb-98	AMEX
	2	ABX	20-Jan-98	3-Feb-98	NYSE
	3	K	10-Feb-98	3-Mar-98	NYSE
	4	BCX	24-Feb-98	12-Mar-98	NYSE
	5	ATP	25-Feb-98	16-Mar-98	AMEX
	6	STT	30-Mar-98	15-Apr-98	NASDAQ
	7	VEN	6-Apr-98	23-Apr-98	NASDAQ
	8	VEN	17-Apr-98	23-Apr-98	NASDAQ
	9	AGE	23-Apr-98	14-May-98	NYSE

10	BGO	23-Apr-98	14-May-98	AMEX
11	ABZ	7-May-98	3-Jun-98	NASDAQ
12	NCT	20-May-98	20-May-98	NYSE
13	FFF	5-Jun-98	18-Jun-98	NASDAQ
14	MLT	30-Jun-98	23-Jul-98	NYSE
15	QLT	13-Jul-98	28-Jul-98	NASDAQ
16	AAC.A	5-Aug-98	5-Aug-98	NASDAQ
17	GRE	17-Aug-98	3-Sep-98	NASDAQ
18	AEC	17-Sep-98	2-Oct-98	NYSE
19	ENB	20-Oct-98	10-Nov-98	NASDAQ
20	W	23-Oct-98	13-Nov-98	NYSE
21	AAC.A	3-Nov-98	19-Nov-98	NASDAQ
22	PDI	5-Nov-98	24-Nov-98	NYSE

[a] Actual or expected issue date.

Appendix 3-B

List of the 42Global Seasoned Equity offerings by Canadian cross-listed shares on the NYSE, AMEX and NASDAQ during the period from 1993 to 1998. The number and percentage of total offerings by year are: 4 offerings (9.5%) in 1993, 1 offering (2.4%) in 1994, 8 offerings (19.0%) in 1995, 14 offerings (33.3%) in 1996, 11 offerings (26.2%) in 1997, and 4 offerings (9.5%) in 1998.

Year	Announcement No.	TSE Ticker	Announcement Date	Issue Date [a]	Issued in [b]	Cross-listed in
1993	1	DMM.B	19-Feb-93	30-Mar-93	E	AMEX
	2	GLG	19-May-93	19-May-93	U	NYSE
	3	AGE	6-Jul-93	15-Jul-93	U	NYSE
	4	ECO	8-Jul-93	14-Jul-93	U	AMEX
1994	1	HUM	31-Oct-94	8-Dec-94	U	NASDAQ
1995	1	LWN	20-Apr-95	25-May-95	U	NYSE
	2	LAN	27-Apr-95	13-Jun-95	N	NASDAQ
	3	ALG	24-May-95	12-Jul-95	N	NASDAQ
	4	GOU	31-May-95	20-Jun-95	N	NYSE
	5	GLG	11-Jul-95	11-Jul-95	U	NYSE
	6	HUM	24-Jul-95	15-Aug-95	U	NASDAQ
	7	POT	26-Oct-95	10-Nov-95	U	NYSE
	8	IQI	13-Nov-95	14-Dec-95	N	NYSE
1996	1	UDI	5-Jan-96	15-Feb-96	N	NYSE
	2	W	18-Jan-96	7-Feb-96	N	NYSE
	3	BCH	6-Feb-96	28-Feb-96	N	NASDAQ
	4	CID	7-Feb-96	22-Feb-96	N	AMEX
	5	DXX	18-Mar-96	23-Apr-96	N	NASDAQ
	6	QLT	1-Apr-96	25-Apr-96	N	NASDAQ
	7	ATP	2-Apr-96	30-Apr-96	N	AMEX
	8	NET.A	22-Apr-96	21-May-96	N	NASDAQ
	9	MG.A	24-May-96	25-Jun-96	N	NYSE
	10	CIF.B	10-Jun-96	3-Jul-96	U	NASDAQ
	11	AAC.B	10-Jul-96	7-Aug-96	N	NASDAQ
	12	LAN	31-Jul-96	31-Jul-96	U	NASDAQ
	13	PD	21-Oct-96	20-Nov-96	G	NYSE
	14	GOU	30-Dec-96	30-Dec-96	N	NYSE
1997	1	FSH	10-Jan-97	12-Feb-97	N	NYSE
	2	ITW	5-Mar-97	1-Apr-97	N	NYSE
	3	AGE	17-Mar-97	15-Apr-97	N	NYSE
	4	TZH	24-Mar-97	30-Apr-97	N	NYSE
	5	LWN	5-May-97	5-Jun-97	U	NYSE
	6	NMR	7-May-97	2-Jul-97	N	NASDAQ
	7	GOU	25-Jun-97	10-Jul-97	N	NYSE
	8	NCT	14-Aug-97	26-Aug-97	N	NYSE
	9	RYG	9-Oct-97	30-Oct-97	N	NYSE
	10	FSV	22-Oct-97	26-Nov-97	U	NASDAQ
	11	NCT	17-Nov-97	3-Dec-97	N	NYSE
1998	1	TLC	18-Mar-98	17-Apr-98	N	NASDAQ
	2	ITW	26-May-98	24-Jun-98	N	NYSE
	3	MNC	28-May-98	29-Jul-98	N	NASDAQ
	4	MG.A	12-Jun-98	24-Jun-98	N	NYSE

(a) Actual or expected issue date.

(b) C =Canada; E = Europe; G= Global; N= North America; U=United States.

Appendix 4-A

List of lead underwriters for the Domestic and Non-domestic seasoned (primary and secondary) equity offerings (SEOs) for Canadian issuers with crosslisted shares on the NYSE, AMEX and NASDAQ for the time period, 1993-1998. Panel A and B report in alphabetical order the names of the lead underwriters for the Domestic and Non-domestic SEOs, respectively

Panel A: Domestic SEOS
Bunting Warburg Inc.
CIBC Wood Gundy Securities Inc.
First Marathon Securities Limited
Goepel, Shields & Partners Inc.
Gordon Capital Corporation
Griffiths McBurney & Partners
Levesque Beaubien Geoffrion Inc.
Loewen, Ondaatje, McCutcheon Limited
McLean McCarthy Inc.
Midland Walwyn Capital Inc.
Nesbitt Burns Inc.
Newcrest Capital Inc.
Pollitt, Bertrand & Co. Inc.
RBC Dominion Securities Inc.
Richardson Greenshields of Canada Limited
ScotiaMcLeod Inc.
Sprott Securities Ltd.
UBS Ltd.
Yorkton Securities Inc.

Panel B: Non-domestic SEOs
CIBC Wood Gundy Securities Inc.
Cowen & Company
Credit Suisse First Boston Corporation
Donaldson, Lufkin & Jenrette Securities
Furman Selz Inc.
Goldman, Sachs & Co.
Hambrecht & Quist Inc.
Howard, Weil, Labouisse, Friedrichs Inc.
Levesque Beaubien Geoffrion Inc.
Loewen, Ondaatje, McCutcheon Limited
Merrill Lynch & Co.
Morgan Stanley Canada Limited
Nesbitt Burns Inc.
Nomura International Ltd.
PaineWebber Incorporated
RBC Dominion Securities Inc.
Richardson Greenshields of Canada Limited
Salomon Smith Barney Canada Inc.

Table 2-1

This table reports the daily averages of the proportional effective bid-ask half-spreads, holding periods, market values, variances of mid-spread returns and mid-spreads for the Canadian share trades executed on the Toronto Stock Exchange for firms cross-listed on the AMEX, NYSE and NASDAQ. Panel A reports the results for the Canadian share trades executed on the TSE that are cross-listed on the AMEX for the pre-TSE-decimalization or Pre-dec. period (from January 1994 to April 1996), the post-TSE-decimalization or Post-dec. period (from May 1996 to December 1998) and the entire period (1994 to 1998). Panels B and C report the results for the share trades executed on the TSE that are cross-listed on the NYSE with and without options traded on them, respectively. Panel D report the results for the share trades executed on the TSE. The average proportional effective half-spread corresponds to the daily average across all shares during a year. The average holding period is calculated by dividing the number of shares outstanding by the annualized daily trading volume during each year for each firm across all shares. The market value of equity of the firm is the average of daily share price times the outstanding shares during the year as reported on the TSE Western database. The volatility of mid-spread returns is the annual average daily variance of mid-spread returns updated to the previous day. The mid-spread is equal to the average of the daily closing ask and bid quotes. The observations correspond to monthly averages. Market value is in Canadian dollars. N indicates the number of firms.

			Effective Half-spreads (Percent)			Holding Periods (Years)			Market Value Million (Cdn$)			Variance Of Mid-spread (Percent)			Mid-spreads		
Period	N	Exchange	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
Panel A: Canadian share trades executed on the TSE for firms with shares that are cross-listed on the AMEX (all firms without options traded on them)																	
Pre-dec.	20	TSE	0.608	0.615	0.072	6.97	6.67	2.38	1,694	1,682	117	0.047	0.043	0.011	20.06	20.11	0.93
Post-dec.	22	TSE	0.953	0.778	0.409	7.05	6.54	2.52	1,504	1,461	254	0.12	0.089	0.066	17.08	18.68	3.73
1994-1998	22	TSE	0.792	0.678	0.347	7.01	6.64	2.43	1,592	1,599	222	0.086	0.066	0.061	18.47	19.45	3.16
Panel B: Canadian share trades executed on the TSE for firms with shares that are cross-listed on the NYSE with options traded on them																	
Pre-dec.	20	TSE	0.282	0.279	0.022	2.44	2.32	0.57	6,141	5,959	504	0.035	0.033	0.008	34.03	32.63	3.34
Post-dec.	21	TSE	0.295	0.275	0.067	6.04	4.89	3.16	7,547	7,347	580	0.093	0.067	0.076	42.03	41.32	2.99
1994-1998	21	TSE	0.289	0.279	0.051	4.36	3.06	2.95	6,890	6,981	890	0.066	0.043	0.062	38.30	39.29	5.10
Panel C: Canadian share trades executed on the TSE for firm that are cross-listed on the NYSE without options traded on them																	
Pre-dec.	25	TSE	0.534	0.533	0.079	2.57	2.53	0.63	1,729	1,549	375	0.046	0.045	0.0102	16.45	15.64	1.84
Post-dec.	29	TSE	0.481	0.493	0.116	4.31	3.99	1.39	2,595	2,588	285	0.093	0.067	0.076	23.19	23.86	2.64
1994-1998	29	TSE	0.506	0.509	0.103	3.50	3.20	1.40	2,190	2,325	545	0.071	0.053	0.060	20.05	20.20	

Table 2-1 (Continued)

Panel D: Canadian share trades executed on the TSE for firms that are cross-listed on the NASDAQ (2 firms with options traded on them)																	
Pre-dec.	37	TSE	0.994	1.016	0.113	5.13	5.11	2.23	477	361	241	0.142	0.157	0.035	10.78	9.60	2.80
Post-dec.	45	TSE	1.28	1.175	0.322	7.44	7 09	2.00	388	375	54	0.143	0.142	0.02	12.42	12.56	1.89
1994-1998	45	TSE	1.146	1.075	0.285	6.36	6.33	2.40	429	373	174	0.142	0.143	0.028	11.65	10.77	2.48

Table 2-2

This table reports the daily averages of the proportional effective bid-ask half-spreads, holding periods, market values, variances of mid-spread returns and mid-spreads for the Canadian cross-listed share trades executed on the AMEX, NYSE, and NASDAQ. Panel A reports results for the share trades executed on the AMEX for the pre-TSE-decimalization or Pre-dec. period (January 1994 to April 1996), the post-TSE-decimalization or Post-dec. period (May 1996 to December 1998), and the entire time period (1994 to 1998). Panel B (C) reports the results for the share trades executed on the NYSE for firms with(out) options traded on them. Panel D displays the results for the share trades executed on the NASDAQ. The average proportional effective half-spread corresponds to the daily average across all shares during each year. The average holding period is calculated by dividing the number of shares outstanding by the annualized daily trading volume during each year for each firm across all shares. The market value of the firm is the average of the daily share price times the outstanding shares during the year as reported in the TSE Western database. The variance of mid-spread returns is the annual average of the daily variance of mid-spread returns updated to the previous day. The mid-spread is equal to the average of the daily closing ask and bid quotes. The observations correspond to monthly averages. Market value is in Canadian dollars. N indicates the number of firms.

			Effective Half-spreads (Percent)			Holding Periods (Years)			Market Value Million (Cdn$)			Variance Of Mid-spread (Percent)			Mid-spreads (Cdn$)		
Period	N	Exchange	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
Panel A: Canadian cross-listed share trades executed on the AMEX (All firms without options traded on them)																	
Pre-dec	16	AMEX	0.548	0.561	0.058	50.13	47.32	18.43	1,694	1,681	118	0.327	0.321	0.06	20.06	20.17	0.95
Post-dec	22	AMEX	0.792	0.585	0.376	42.19	39.29	13.02	1,521	1,461	294	0.353	0.331	0.089	17.12	18.68	3.72
1994-1998	22	AMEX	0.678	0.567	0.301	45.90	42.01	16.14	1,601	1,595	243	0.341	0.331	0.078	18.49	19.46	3.14
Panel B: Canadian cross-listed share trades executed on the NYSE for firms with options traded on them																	
Pre-dec	16	NYSE	0.326	0.312	0.045	9.45	9.42	4.20	6,138	5,958	502	0.058	0.051	0.02	34.00	32.63	3.32
Post-dec	21	NYSE	0.227	0.228	0.048	10.20	10.0	2.62	7,567	7,346	587	0.219	0.144	0.147	42.67	42.10	3.42
1994-1998	21	NYSE	0.273	0.276	0.068	9.85	9.66	3.44	6,900	6,980	901	0.144	0.085	0.134	38.62	39.27	5.49
Panel C: Canadian cross-listed share trades executed on the NYSE for firms without options traded on them																	
Pre-dec	15	NYSE	0.646	0.638	0.087	18.48	8.59	18.44	1,729	1,551	375	0.051	0.05	0.0108	16.45	15.63	1.849
Post-dec	29	NYSE	0.488	0.492	0.066	38.41	37.54	10.74	2,613	2,592	296	0.219	0.144	0.147	23.64	24.18	2.85
1994-1998	29	NYSE	0.562	0.552	0.11	29.11	28.51	17.80	2,200	2,331	555	0.141	0.075	0.136	20.29	20.24	4.35

Table 2-2 (Continued)

Panel D: Canadian cross-listed share trades executed on the NASDAQ (Two firms with options traded on them)																		
Pre-dec	27	NASDAQ	1.782	1.758	0.230	28.79	15.43	34.06	478	361	242	0.614	0.554	0.221	10.78	9.65	2.82
Post-dec	45	NASDAQ	1.851	1.673	0.414	29.27	23.98	18.06	393	374	58	0.634	0.625	0.071	12.56	12.55	2.06
1994-1998	45	NASDAQ	1.819	1.742	0.339	29.05	20.27	26.50	432	373	174	0.624	0.595	0.158	11.73	10.76	2.58

Table 2-3

This table reports the average means, medians, and standard deviations of the effective half-spreads and holding periods for the share trades executed on the TSE and the same-firm share trades executed on the AMEX, NYSE, and NASDAQ. It also reports the ratios of effective half-spreads (holding periods) between the share trades executed on each U.S. trade venue and the same-firm share trades executed on the TSE. Panel A reports these values for the cross-listed share trades executed on the TSE and the AMEX. Panels B, C and D report the results for the cross-listed share trades executed on the TSE, NYSE with(out) traded options on them and NASDAQ, respectively. This is for the pre-(post-)TSE-decimalization and the entire time periods. The observations correspond to the monthly averages across all shares of the daily effective half-spreads and the annualized daily holding periods. The 'p-value for difference' report the p-values for the tests of the differences in means (t-test) and medians (Wilcoxon/Mann-Whitney test). Last row of each panel reports the 'p-value for ratio difference' which correspond to p-values of the differences in means (t-test) and medians (Wilcoxon/Mann-Whitney test) in effective half-spreads (holding periods) for the ratios between the share trades executed on each U.S. trade venue and the same-firm share trades executed on the TSE, ES^{US}/ES^{TSE} (HP^{US}/HP^{TSE}) between the pre- and post-TSE-decimalization periods. That is, it reports the p-values of the difference between $(ES^{US}/ES^{TSE})^{pre\text{-}decimalization}$ and $(ES^{US}/ES^{TSE})^{post\text{-}decimalization}$ and between $(HP^{US}/HP^{TSE})^{pre\text{-}decimalization}$ and $(HP^{US}/HP^{TSE})^{post\text{-}decimalization}$, respectively. *, **, and *** correspond to levels of significance of 10, 5 and 1 percent, respectively. Num. indicates the number of monthly observations.

		Trade Venue	Effective Half-spreads (Percent)			Holding Periods (Years)		
Period	Num.	Amex	Mean	Median	Std Dev	Mean	Median	Std Dev
Panel A: Canadian share trades executed on the TSE and the AMEX (22 firms without options traded on them)								
Pre-dec	28	TSE	0.608	0.615	0.072	6.97	6.67	2.38
		AMEX	0.548	0.561	0.058	50.13	47.32	18.43
		p-value for difference	0.001***	0.001***	0.251	0***	0***	0***
Post-dec	32	TSE	0.953	0.778	0.409	7.05	6.54	2.52
		AMEX	0.792	0.585	0.376	42.19	39.29	13.02
		p-value	0.105	0.034**	0.637	0***	0***	0***
1994-1998	60	TSE	0.792	0.678	0.347	7.01	6.64	2.43
		AMEX	0.678	0.567	0.301	45.90	42.01	16.14
		p-value for difference	0.056*	0.001***	0.280	0***	0***	0***
Pre-dec	28	AMEX/TSE	0.917	0.904	0.175	7.85	6.85	3.56
Post-dec	32	AMEX/TSE	0.834	0.826	0.112	6.67	5.71	3.17
		p-value for ratio difference	0.029**	0.079*	0.022**	0.181	0.108	0.541
Panel B: Canadian share trades executed on the TSE and the NYSE (21 firms with options traded on them)								
Pre-dec	28	TSE	0.282	0.279	0.022	2.44	2.32	0.57
		NYSE	0.326	0.312	0.045	9.45	9.42	4.20
		p-value for difference	0***	0.0003***	0.0003***	0***	0***	0***
Post-dec	32	TSE	0.295	0.275	0.067	6.04	4.89	3.169
		NYSE	0.227	0.228	0.048	10.20	10.08	2.626
		p-value for difference	0***	0***	0.062	0***	0***	0***
1994-1998	60	TSE	0.289	0.279	0.051	4.36	3.06	2.95
		NYSE	0.273	0.276	0.068	9.85	9.66	3.44
		p-value for difference	0.1400	0.3098	0.032**	0***	0***	0***

Table 2-3 (Continued)

		Trade Venue	Effective Half-spreads (Percent)			Holding Periods (Years)		
Period	Num.	Amex	Mean	Median	Std Dev	Mean	Median	Std Dev
Pre-dec	28	NYSE/TSE	1.158	1.155	0.155	3.96	3.39	1.99
Post-dec	32	NYSE/TSE	0.803	0.736	0.252	2.04	1.91	0.93
		p-value for ratio difference	0.000***	0.000***	0.010**	0.000***	0.000***	0.000***
Panel C: Canadian share trades executed on the TSE and the NYSE (29 firms without options traded on them)								
Pre-dec	28	TSE	0.534	0.533	0.079	2.57	2.53	0.63
		NYSE	0.646	0.638	0.087	18.48	8.59	18.44
		p-value for difference	0***	0***	0.6134	0***	0***	0***
Post-dec	32	TSE	0.481	0.493	0.116	4.31	3.99	1.39
		NYSE	0.488	0.492	0.066	38.41	37.54	10.74
		p-value for difference	0.7516	0.6432	0.002***	0***	0***	0***
1994-1998	60	TSE	0.506	0.509	0.103	3.50	3.20	1.40
		NYSE	0.562	0.552	0.11	29.11	28.51	17.80
		p-value for difference	0.005***	0.018**	0.646	0***	0***	0***
Pre-dec	28	NYSE/TSE	1.217	1.200	0.102	7.04	3.81	6.89
Post-dec	32	NYSE/TSE	1.074	0.983	0.304	9.51	8.77	3.47
		p-value for ratio difference	0.021**	0.006***	0.000***	0.079*	0.001***	0.001***
Panel D: Canadian share trades executed on the TSE and the NASDAQ (Two firms with options traded on them)								
Pre-dec	28	TSE	0.994	1.016	0.113	5.13	5.11	2.23
		NASDAQ	1.782	1.758	0.230	28.79	15.43	34.06
		p-value for difference	0***	0***	0.0005***	0.0006***	0***	0***
Post-dec	32	TSE	1.280	1.175	0.322	7.44	7.09	2.00
		NASDAQ	1.851	1.673	0.414	29.27	23.98	18.06
		p-value for difference	0***	0***	0.1699	0***	0***	0***
1994-1998	60	TSE	1.146	1.075	0.285	6.36	6.33	2.400
		NASDAQ	1.819	1.742	0.339	29.05	20.27	26.50
		p-value for difference	0***	0***	0.180	0***	0***	0***
Pre-dec	28	NASDAQ/TSE	1.808	1.735	0.257	6.34	3.67	6.61
Post-dec	32	NASDAQ/TSE	1.468	1.422	0.203	4.18	3.03	2.80
		p-value for ratio difference	0.000***	0.000***	0.214	0.096*	0.22	0.000***

Table 2-4

This table reports the results of the regressions of the holding period (HP_{iT}) on the proportional effective bid-ask half-spread (ES_{iT}), market value (MV_{iT}), mid-point return variance (VAR_{iT}) and the mid-spread (MS_{it}) for the Canadian share trades executed on the TSE for firms that are cross-listed on the AMEX (Panel A), the NYSE (Panels B and C), and NASDAQ (Panel D). The table reports the results for the entire time period and the entire time period with dummies to capture the post-TSE-decimalization period (May 1996 to 1998). The dummy variable $D1$ takes the value of one if ES_{iT}, MV_{iT}, VAR_{iT} and MS_{iT} correspond to the sample period after the TSE decimalization on April 25, 1996, and zero otherwise. The dummy $D2$ takes the value of one for each year (1995 to 1998), and is zero otherwise. The variables MV_{it}, VAR_{it} and MS_{iT} are used as control variables. The following SUR system is estimated:

$$HP_{iT} = b_0 + b_1 ES_{iT} + b_2 MV_{iT} + b_3 VAR_{iT} + b_4 MS_{iT} + b_5 ES_{iT} D1 + B_6 MV_{iT} D1 + b_7 VAR_{iT} D1 + b_8 MS_{iT} D1 + b_9 D2_{\tau=1995} + \ldots + b_{12} D2_{\tau=1998} + \varepsilon_{iT}$$

where

$$ES_{iT} = c_0 + c_1 ES_{iT-1} + c_2 MV_{iT} + c_3 VAR_{iT} + c_4 MS_{iT-1} + c_5 ES_{iT-1} D1 + c_6 MV_{iT} D1 + c_7 VAR_{iT} D1 + c_8 MS_{iT-1} D1 + c_9 D2_{\tau=1995} + \ldots + c_{12} D2_{\tau=1998} + \varepsilon_{iT}$$

The fitted values of ES_{iT} obtained from the second equation are included as an instrumental variable for the ES_{iT} in the first equation to avoid the endogeneity between HP and ES. The coefficients b_0, $b_1, \ldots b_{12}$, c_0, c_1, … and c_{12} are the parameters to be estimated. Panel A reports the values for the Canadian share trades executed on the TSE for firms with cross-listed shares on the AMEX. Panel B (C) reports the results for the Canadian share trades executed on the TSE for firms with cross-listed shares on the NYSE with(out) options traded on them. Panel D displays the results for the Canadian share trades executed on the TSE for firms with cross-listed shares on NASDAQ. The observations are monthly averages of daily trades. The cells report the estimated coefficients and their associated p-values in parentheses based on tests for significance using Newey and West robust t-statistics. *, **, and *** indicate significance at levels of 10, 5, and 1 percent, respectively. The adjusted R square values are reported in the last column. All variables are in natural logarithms (except the dummies). N denotes the number of firms.

	Constant	*ES*	*MV*	*VAR*	*MS*	*ES*D1*	*MV*D1*	*VAR*D1*	*MS*D1*	
N	b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8	R^2 adj
			Panel A: Canadian share trades executed on the TSE for firms that are cross-listed on AMEX							
22	-0.0071	0.5252	0.1925	-0.2202	-0.0371					0.561
	(0.975)	(0)***	(0)***	(0.036)**	(0.599)	-	-	-	-	
22	0.3390	0.5088	0.2047	-0.2202	-0.3717	-0.0329	-0.0200	0.1482	0.3784	0.595
	(0.322)	(0)***	(0.024)**	(0.036)**	(0.026)**	(0.726)	(0.793)	(0.170)	(0.023)**	
Panel B: Canadian share trades executed on the TSE for firms that are cross-listed on NYSE with options traded on them										
21	0.3546	0.1675	0.0767	-0.0298	0.0721					0.659
	(0.333)	(0.001)***	(0.133)	(0.330)	(0.339)	-	-	-	-	
21	0.2975	-0.0342	-0.0418	-0.1515	0.1659	0.3183	0.1870	0.1163	-0.1442	0.663
	(0.411)	(0.714)	(0.538)	(0.010)**	(0.183)	(0.002)***	(0.003)***	(0.045)**	(0.279)	
	Panel C: Canadian share trades executed on the TSE for firms that are cross-listed on NYSE without options traded on them									
29	2.7833	0.1591	-0.3093	-0.0508	0.2185					0.592
	(0)***	(0.001)***	(0)***	(0.340)	(0.003)***	-	-	-	-	
29	2.9148	-0.0805	-0.4556	-0.3896	-0.0258	0.3123	0.1842	0.4216	0.2991	0.592
	(0)***	(0.579)	(0)***	(0)***	(0.894)	(0.033)**	(0.010)**	(0)***	(0.126)	
			Panel D: Canadian share trades executed on the TSE for firms that are cross-listed on NASDAQ							
45	0.5884	0.3192	0.2064	-0.0104	-0.1840					0.584
	(0)***	(0)***	(0)***	(0.669)	(0)***	-	-	-	-	
45	0.7443	0.3074	0.1747	-0.1890	-0.3806	0.0784	0.0289	0.2595	0.3157	0.564
	(0)***	(0)***	(0)***	(0)***	(0)***	(0.141)	(0.477)	(0)***	(0)***	

Table 2-5

This table reports the results of the regressions of the holding period (HP_{iT}) on the proportional effective bid-ask half-spread (ES_{iT}), market value (MV_{iT}), mid-point return variance (VAR_{iT}) and the mid-spread (MS_{it}) for the Canadian cross-listed share trades executed on the AMEX (Panel A), the NYSE (Panels B and C), and NASDAQ (Panel D). The table reports the results for the entire time period and the entire time period with dummies to capture the post-TSE-decimalization period (May 1996 to 1998). The dummy variable $D1$ takes the value of one if ES_{iT}, MV_{iT}, VAR_{iT} and MS_{iT} correspond to the sample period after the TSE decimalization on April 25, 1996, and zero otherwise. The dummy $D2$ takes the value of one for each year (1995 to 1998), and is zero otherwise. The variables MV_{it}, VAR_{it} and MS_{iT} are used as control variables. The following SUR system is estimated:

$$\begin{aligned} HP_{iT} = {} & b_0 + b_1 ES_{iT} + b_2 MV_{iT} + b_3 VAR_{iT} + b_4 MS_{iT} + b_5 ES_{iT} D1 + B_6 MV_{iT} D1 + b_7 VAR_{iT} D1 \\ & + b_8 MS_{iT} D1 + b_9 D2_{\tau=1995} + \ldots + b_{12} D2_{\tau=1998} + \varepsilon_{iT} \end{aligned}$$

where

$$\begin{aligned} ES_{iT} = {} & c_0 + c_1 ES_{iT-1} + c_2 MV_{iT} + c_3 VAR_{iT} + c_4 MS_{iT-1} + c_5 ES_{iT-1} D1 + c_6 MV_{iT} D1 + c_7 VAR_{iT} D1 \\ & + c_8 MS_{iT-1} D1 + c_9 D2_{\tau=1995} + \ldots + c_{12} D2_{\tau=1998} + \varepsilon_{iT} \end{aligned}$$

The fitted values of ES_{iT} obtained from the second equation are included as an instrumental variable for the ES_{iT} in the first equation to avoid the endogeneity between HP and ES. The coefficients b_0, $b_1, \ldots b_{12}$, c_0, c_1, … and c_{12} are the parameters to be estimated. Panel A reports the values for the Canadian share trades executed on the TSE for firms with cross-listed shares on the AMEX. Panel B (C) reports the results for the Canadian share trades executed on the TSE for firms with cross-listed shares on the NYSE with(out) options traded on them. Panel D displays the results for the Canadian share trades executed on the TSE for firms with cross-listed shares on NASDAQ. The observations are monthly averages of daily trades. The t-statistics are in parentheses. *, **, and *** indicate significance at levels of 10, 5, and 1 percent, respectively. The adjusted R square values are reported in the last column. All variables are in natural logarithms (except the dummies). N denotes the number of firms.

N	*Constant* b_0	*ES* b_1	*MV* b_2	*VAR* b_3	*MS* b_4	*ES*D1* b_5	*MV*D1* b_6	*VAR*D1* b_7	*MS*D1* b_8	R^2 *adj*
Panel A: Canadian cross-listed share trades executed on AMEX										
22	-1.410 (0.268)	0.147 (0.012)**	0.4714 (0.010)**	0.0195 (0.639)	-0.1788 (0.367)	-	-	-	-	0.875
22	-1.630 (0.213)	0.2101 (0.057)*	0.4987 (0.014)**	-0.0215 (0.696)	-0.4117 (0.142)	-0.1486 (0.251)	-0.0450 (0.576)	0.0284 (0.608)	0.1700 (0.410)	0.876
Panel B: Canadian cross-listed share trades executed on the NYSE for firms with options traded on them										
21	-1.480 (0.177)	0.0149 (0.734)	0.5575 (0)***	0.0026 (0.947)	-0.4179 (0.029)**	-	-	-	-	0.882
21	-1.484 (0.175)	0.1989 (0.033)**	0.5492 (0.001)***	0.0146 (0.793)	-0.3600 (0.147)	-0.2281 (0.028)**	0.0030 (0.966)	-0.0197 (0.733)	-0.0947 (0.604)	0.882
Panel C: Canadian cross-listed share trades executed on the NYSE for firms without options traded on them										
29	4.255 (0.022)**	0.1387 (0.004)***	-0.1230 (0.528)	-0.1563 (0)***	0.2637 (0.222)	-	-	-	-	0.873
29	3.273 (0.063)*	0.1686 (0)***	0.1967 (0.361)	-0.1915 (0.109)	-0.5646 (0.061)*	0.2642 (0.072)*	-0.2666 (0.007)***	0.0367 (0.753)	0.8721 (0)***	0.874
Panel D: Canadian cross-listed share trades executed on the NASDAQ (two firms with options traded on them)										
45	-0.1221 (0.854)	0.3070 (0)***	0.6666 (0)***	-0.0265 (0.482)	-0.4790 (0)***	-	-	-	-	0.813
45	-0.0984 (0.883)	0.2996 (0)***	0.7743 (0)***	-0.0424 (0.404)	-0.7673 (0)***	0.0068 (0.920)	-0.1371 (0.014)	0.0302 (0.575)	0.3716 (0.004)***	0.812

Table 2-6

This table reports the results of the regressions of the differences in the holding periods ($HP1_{iT}$-HP_{iT}) for the same-firm share trades executed on AMEX, NYSE, or NASDAQ, and in the TSE. The difference in holding periods is regressed on the proportional differences in effective half-spreads ($ES1_{iT}$ - ES_{iT}), and mid-point return variances ($VAR1_{iT}$ - VAR_{iT}). Panel A reports the results for the cross-listed share trades executed on the AMEX and TSE. Panels B and C report the values for the share trades executed on the NYSE with and without traded options on them, respectively, and TSE. Panel D reports the results for the share trades executed on the NASDAQ and TSE. The table reports the results for the entire time period with and without dummies for the post-TSE-decimalization period (May 1996 to 1998). The dummy variable $D1$ takes the value of one if the ($ES1_{iT}$ - ES_{iT}) and ($VAR1_{iT}$ - VAR_{iT}) correspond to the sample period after the TSE decimalization on April 25, 1996, and is zero otherwise. The dummy $D2$ takes the value of one for each year (1995 to 1998), and is zero otherwise. The variable ($VAR1_{iT}$ - VAR_{iT}) is a control variable. The following SUR system is estimated:

$$HP1_{iT} - HP_{iT} = b_0 + b_1(ES1_{iT} - ES_{iT}) + b_2(VAR1_{iT} - VAR_{iT}) + b_3(MS1_{iT} - MS_{iT}) + B_4(ES1_{iT} - ES_{iT})D1 + B_5(VAR1_{iT} - VAR_{iT})D1 + B_6(MS1_{iT} - MS_{iT})D1 + B_7D2_{\tau=1995} + \ldots + B_{10}D2_{\tau=1998} + \varepsilon_{iT}$$

where
$$ES_{iT} = c_0 + c_1ES_{iT-1} + c_2MV_{iT} + c_3VAR_{iT} + c_4MS_{iT-1} + c_5ES_{iT-1}D1 + c_6MV_{iT}D1 + c_7VAR_{iT}D1 + c_8MS_{iT-1}D1 + c_9D2_{\tau=1995} + \ldots + c_{12}D2_{\tau=1998} + \varepsilon_{iT}$$

The fitted values of $ES1_{iT}$ (ES_{iT}) obtained from the second equation are included as an instrumental variable for the $ES1_{iT}$ (ES_{iT}) in the first equation to avoid the endogeneity between HP and ES. The coefficients b_0, b_1...B_6, and c_0,c_1 ...c_8 are the parameters to be estimated. The t-statistics are in parentheses. *, **, and *** indicate significance at levels of 10, 5, and 1 percent, respectively. The adjusted R^2 values are reported in the last column. All variables are in natural logs (except the dummies). N denotes the number of firms.

N	b_0 Constant	b_1 (ES1-ES)	b_2 (VAR1-VAR)	b_3 (MS1-MS)	b_4 (ES1-ES)* D1	b_5 (VAR1-VAR)*D1	b_6 (MS1-MS)*D1	R^2 adj
Panel A: Canadian cross-listed share trades executed on the AMEX and the TSE								
22	-1.151	0.2042	-0.0793	0.7905				0.846
	(0.043)*	(0)***	(0.148)	(0.141)		-	-	
22	-1.172	0.2330	-0.1159	-2.248	-0.0410	0.0697	3.137	0.846
	(0.040)**	(0.008)***	(0.116)	(0.732)	(0.686)	(0.395)	(0.634)	
Panel B: Canadian cross-listed share trades executed on the NYSE and the TSE (21 firms with options traded on them)								
21	0.4538	0.0918	-0.0138	0.4658				0.886
	(0.379)	(0.001)***	(0.758)	(0.248)	-	-	-	
21	0.5581	0.0723	0.1020	5.582	0.0280	-0.1635	-5.205	0.886
	(0.286)	(0.166)	(0.139)	(0.253)	(0.636)	(0.027)**	(0.288)	
Panel C: Canadian cross-listed share trades executed on the NYSE and the TSE (29 firms without options traded on them)								
29	0.6345	0.1031	0.0788	0.0840				0.881
	(0.270)	(0.004)***	(0.043)**	(0.940)	-	-	-	
29	0.6363	-0.0120	0.1619	-15.897	0.13261	-0.0812	16.244	0.881
	(0.265)	(0.909)	(0.380)	(0.119)	(0.206)	(0.659)	(0.113)	
Panel D: Canadian cross-listed share trades executed on the NASDAQ and the TSE (only 2 firms with options traded on them)								
45	-1.177	0.2876	0.0586	-0.9356				0.841
	(0.002)***	(0)***	(0.120)	(0.013)**	-	-	-	
45	-1.267	0.2719	0.0097	-1.583	0.030	0.0710	0.6539	0.840
	(0.001)**	(0)***	(0.857)	(0.302)	(0.648)	(0.166)	(0.679)	

Table 2-7

This table reports Granger causality tests between the ratio of holding periods and the ratios of effective half-spreads for the share trades executed on the AMEX, NYSE with(out) options traded on them and the NASDAQ. The bivariate regression for the Granger causality used is as follows:

$$RES_{iT} = \gamma_0 + \gamma_1 RES_{iT-1} + \ldots + \gamma_k RES_{iT-k} + \lambda_1 RHP_{iT-1} + \ldots + \lambda_k RHP_{iT-k}$$
$$RHP_{iT} = \gamma_0 + \gamma_1 RHP_{iT-1} + \ldots + \gamma_k RHP_{iT-k} + \lambda_1 RES_{iT-1} + \ldots + \lambda_k RES_{iT-k}$$

RES_{iT} (RHP_{iT}) is equal to the ratio ES^{US}/ES^{TSE} (HP^{US}/HP^{TSE}) and corresponds to the ratio of effective half-spreads (holding periods) between the share trades executed on the U.S. trade venue and the same-firm share trades executed on the TSE. The letter k represents the number of months T each variable is lagged. The Wald F-statistic tests the joint hypothesis $\lambda_1 = \ldots = \lambda_k = 0$ for each equation, where the null hypothesis is that *RHP* (*RES*) does not Granger cause *RES* (*RHP*) in the first (second) equation. The highlighted rows shown with an *a* indicate: Ratio Holding Periods (*HP1/HP*) does not Granger-cause Ratio Effective Half-spreads (*ES1/ES*); and the rows shown with a *b* indicate: Ratio Effective Half-spreads (*ES1/ES*) does not Granger-cause Ratio Holding Periods (*HP1/HP*). The Wald F-statistic and its associated probability are reported for lags 2 to 9. *, **, and *** display significance at levels of 10, 5, and 1 percent, respectively.

		AMEX		NYSE w/Options		NYSE w/o Options		NASDAQ	
Lags	Direction of Causality	F-stat	Prob	F-stat	Prob	*F-stat*	Prob	*F-stat*	*Prob*
2	*a*	6.40	0.002 ***	12.80	0.000 ***	15.68	0.000 ***	60.89	0.000 ***
	b	0.31	0.733	1.23	0.294	0.35	0.708	3.59	0.028 **
3	*a*	3.34	0.019 **	5.83	0.001 ***	7.50	0.000 ***	27.48	0.000 ***
	b	0.67	0.568	0.92	0.430	0.62	0.603	0.56	0.639
4	*a*	2.33	0.05 *	4.17	0.002 ***	5.59	0.000 ***	15.16	0.000 ***
	b	1.76	0.135	1.17	0.324	0.54	0.707	0.95	0.436
5	*a*	2.96	0.012 **	2.77	0.017 **	5.12	0.000 ***	11.20	0.000 ***
	b	1.90	0.092 *	1.25	0.285	0.75	0.587	0.60	0.704
6	*a*	2.28	0.035 **	4.11	0.000 ***	4.52	0.000 ***	9.94	0.000 ***
	b	1.80	0.097 *	1.03	0.403	0.30	0.935	0.50	0.812
7	*a*	2.15	0.037 **	4.27	0.000 ***	3.86	0.000 ***	7.91	0 ***
	b	1.58	0.137	0.81	0.582	0.82	0.572	1.08	0.374
8	*a*	2.06	0.038 **	3.89	0.000 ***	4.53	0.000 ***	7.24	0.000 ***
	b	1.68	0.099 *	0.79	0.607	0.57	0.807	3.24	0.0011 ***
9	*a*	1.50	0.143	3.49	0.000 ***	2.02	0.035 **	5.85	0 ***
	b	1.83	0.059 *	0.86	0.558	1.10	0.358	2.38	0.011 **

Table 2-8

This table reports means, medians and standard deviations for the expected determinants of share turnover. The description of each proxy variable used as a determinant is as follows: TO_i is share turnover for firm i, and is equal to the reciprocal of the holding period (i.e., 1/HP) for the cross-listed share trades executed on the TSE or the U.S. trade venue. ES_i is the effective half-spread and is a proxy for trade costs. MV_i is the market equity of shares and proxies for firm size. P_i is the stock price. A_i, β_i^{TSE} and SE_i are the intercept coefficient, the slope coefficient and the standard error of the monthly time series regressions of stock i's return on the TSE and the CRSP (orthogonalized) market weighted return, respectively. β_i^{US} is the slope coefficient from the residuals of the time series regression of the CRSP market weighted return with the TSE market weighted return. The values of the means, medians and standard deviation of returns for ES_i,... β_i^{US} are displayed in columns (1)...(8), respectively. Panels A, B, C and D report the descriptive statistics of the various determinants for the shares cross-listed on the AMEX, NASDAQ and the NYSE with(out) options traded on them, respectively. Sub-panels A1, A2 and A3 report the results for the share trades executed on the TSE for the same-firm share trades executed on the AMEX and for the ratios of share trades executed on the AMEX relative to the same-firm share trades executed on the AMEX, respectively. Sub-panels B1, B2 and B3, and C1, C2 and C3 report similar results for the share trades executed on the NASDAQ and the NYSE with(out) options traded on them, respectively. The ratios of each explanatory variable, ES_i ... β_i^{US}, are the ratios of the share trades executed on the U.S. trade venue relative to the same-firm share trades executed on the TSE. The ratio for the share turnover TO_i is equal to the share volume traded on the TSE relative to trading volume on the U.S. for the same-firm cross-listed shares.

(1) TO	(2) ES	(3) MV	(4) P	(5) A	(6) β^{TSE}	(7) SE	(8) β^{US}
			Panel A: TSE Canadian shares cross-listed on AMEX				
			Panel A1: Share trades executed on the TSE				
0.271	0.903	1,222	15.05	-0.00033	0.9680	0.0066	-0.8157
0.187	0.890	344	11.36	-0.00047	0.8584	0.0054	-0.4957
0.197	0.533	2,348	12.90	0.00090	0.6497	0.0041	1.0629
			Panel A2: Share trades executed on AMEX				
0.291	0.851	1,222	15.05	-0.00041	0.5626	0.0061	-0.9412
0.103	0.750	344	11.36	-0.00033	0.5275	0.0045	-0.5245
0.408	0.589	2,348	12.90	0.00143	0.3989	0.0047	1.1426
			Panel A3: Ratios of share trades executed on the AMEX and TSE				
10.369	1.063	1,222	15.05	0.22299	0.6152	0.9045	2.0311
2.447	1.035	344	11.36	0.72180	0.5857	0.8945	1.0225
21.454	0.512	2,348	12.90	2.87192	0.2963	0.1674	4.6574
			Panel B: TSE Canadian shares cross-listed on NASDAQ				
			Panel B1: Share trades executed on the TSE				
0.294	1.336	355	11.36	0.00008	1.0969	0.0084	-0.0833
0.234	1.100	141	8.72	-0.00010	0.9580	0.0068	-0.0985
0.200	0.918	534	8.82	0.00152	0.6461	0.0054	1.2427
			Panel B2: Share trades executed on NASDAQ				
0.406	1.826	355	11.36	-0.00076	0.5735	0.0067	-0.1819
0.122	1.640	141	8.72	-0.00042	0.5394	0.0063	-0.0776
0.706	0.997	534	8.82	0.00163	0.4586	0.0029	0.9914

Table 2-8 (Continued)

Panel B3: Ratios of share trades executed on the NASDAQ and TSE.							
8.880	1.577	355	11.36	-8.51372	0.4739	0.9307	1.1591
1.732	1.590	141	8.72	0.66042	0.4996	0.9458	0.6249
18.044	0.704	534	8.82	58.38066	0.4778	0.3323	4.3670
Panel C: TSE Canadian shares cross-listed on NYSE with options traded on them							
Panel C1: Share trades executed in the TSE							
0.487	0.288	5,885	38.13	-0.00006	0.9599	0.0043	-0.1010
0.510	0.230	4,466	34.21	-0.00009	1.0007	0.0041	-0.1663
0.212	0.171	4,721	13.30	0.00098	0.3846	0.0018	0.7064
Panel C2: Share trades executed on the NYSE with options traded on them							
0.470	0.271	5,885	38.13	0.00085	0.4784	0.0088	0.1620
0.308	0.210	4,466	34.21	0.00005	0.4521	0.0061	0.1775
0.487	0.165	4,721	13.30	0.00240	0.2700	0.0106	0.9498
Panel C3: Ratios of share trades executed on the NYSE with options traded on them and TSE							
6.258	1.059	5,885	38.13	0.65481	0.8435	2.0578	1.3535
1.394	1.063	4,466	34.21	0.74484	0.4774	1.0031	0.5067
13.143	0.438	4,721	13.30	5.86635	1.4371	2.3502	4.6146
Panel D: TSE Canadian shares cross-listed on NYSE without options traded on them							
Panel D1: Share trades executed in the TSE							
0.420	0.492	2,698	23.91	-0.00035	0.9778	0.0048	-0.1871
0.375	0.430	1,438	22.11	-0.00042	0.8814	0.0039	-0.0349
0.266	0.302	3,447	13.72	0.00078	0.4706	0.0023	0.8167
Panel D2: Share trades executed on the NYSE without options traded on them							
0.214	0.466	2,698	23.91	0.00043	0.5452	0.0088	-0.5848
0.127	0.340	1,438	22.11	-0.00001	0.5177	0.0076	-0.1204
0.240	0.262	3,447	13.72	0.00269	0.5248	0.0075	1.8453
Panel D3: Ratios of share trades executed on the NYSE without options traded on them and TSE							
14.703	1.070	2,698	23.91	1.10040	0.5633	1.9027	-0.6226
2.891	1.048	1,438	22.11	0.75564	0.5611	1.4306	0.3205
23.390	0.480	3,447	13.72	5.10973	0.4738	1.3670	4.1909

Table 2-9

This table reports results of the cross-sectional model of (relative) share turnover on various expected determinants for the shares cross-listed on the TSE, AMEX, NYSE with(out) traded options on them and NASDAQ. The two versions of the model are as follows:

$$TO_i = \alpha_0 + (\alpha_1 + \delta_{ES} NOP)ES_i + (\alpha_2 + \delta_{MV} NOP)MV_i + (\alpha_3 + \delta_p NOP)P_i + (\alpha_4 + \delta_A NOP)A_i + (\alpha_5 + \delta_{\beta TSE} NOP)\beta_i^{TSE} + (\alpha_6 + \delta_{SE} NOP)SE_i + (\alpha_7 + \delta_{\beta US} NOP)\beta_i^{US} + \varepsilon_i$$

$$RTO_i = \alpha'_0 + (\alpha'_1 + \delta_{RES} NOP)RES_i + (\alpha'_2 + \delta_{MV} NOP)MV_i + (\alpha'_3 + \delta_p NOP)P_i + (\alpha'_4 + \delta_{RA} NOP)RA_i + (\alpha'_5 + \delta_{R\beta TSE} NOP)R\beta_i^{TSE} + (\alpha'_6 + \delta_{RSE} NOP)RSE_i + (\alpha'_7 + \delta_{R\beta US} NOP)R\beta_i^{US} + \varepsilon_i$$

TO_i is share turnover for firm i, and is equal to the reciprocal of the holding period (i.e., 1/HP) for the cross-listed share trades executed on the TSE or the U.S. trade venue. ES_i is the effective half-spread and proxies for trade costs. MV_i is the market equity of shares and proxies for firm size. P_i is the stock price. A_i, β_i^{TSE} and SE_i are the intercept coefficient, the slope coefficient and the standard error of the monthly time series regressions of stock i's return on the TSE and the CRSP (orthogonalized) market weighted return, respectively. β_i^{US} is the slope coefficient from the residuals of the time series regression of the CRSP market weighted return with the TSE market weighted return. NOP is a dummy variable that is equal to one if the share does not have options traded on them, and it is zero otherwise. $RES_i \ldots R\beta_i^{US}$ are the ratios of the share trades executed on the U.S. trade venue relative to the same-firm share trades executed on the TSE for TO_i, $ES_i \ldots R\beta_i^{US}$. The ratio RTO_i is equal to the share volume traded *on* the TSE relative to trading volume on the U.S. trade venues for the same-firm cross-listed shares. α_0 and α'_0 are the intercepts (Const.) for the regressions TO and RTO, respectively. The estimated coefficients $\alpha_1 \ldots \alpha_7$ ($\delta_{ES} \ldots \delta_{\beta US}$) correspond to the variables $ES_i \ldots \beta_i^{US}$ for shares with(out) options traded on them. The estimated coefficients $\alpha'_1 \ldots \alpha'_7$ ($\delta_{ES} \ldots \delta_{\beta US}$) correspond to the variables of $RES_i \ldots R\beta_i^{US}$ for shares with(out) options traded on them. Panels A, B and C report the estimated coefficients of the cross-sectional regressions of TO on the various determinants for the cross-listed share trades executed on the AMEX, NASDAQ and the NYSE with(out) options traded on them. Sub-panels A1, A2 and A3 report the results for the share trades executed on the TSE for the same-firm share trades executed on the AMEX, and for the ratios of share trades executed on the AMEX relative to the same-firm share trades executed on the AMEX, respectively. Sub-panels B1, B2 and B3, and C1, C2 and C3 report similar results for the shares cross-listed on the NASDAQ and the NYSE with(out) options traded on them, respectively. All the variables are converted to natural logarithms, except A_i, β_i^{TSE}, β_i^{US}, RA_i, $R\beta_i^{TSE}$, $R\beta_i^{US}$ and the dummy variable NOP. All variables are monthly averages of daily trade information, except for α_i, β_i^{TSE}, SE_i and β_i^{US}, which are monthly observations. The time series data for each variable is averaged for the five-year period 1994-1998. The cells report the estimated coefficients (Coeff.) and their associated p-values (p-value) in parenthesis based on tests for significance using Newey and West robust t-statistics. The adjusted R^2 and the probability (F-statistic) values are reported in the last two rows. *, ** and *** indicate significance at levels of 10, 5, and 1 percent, respectively.

Panel A: TSE Canadian cross-listed shares on AMEX

Panel A1: Share trades executed on the TSE

	Const.	*ES*	*MV*	*P*	*A*	β^{TSE}	*SE*	β^{US}		
	α_0	δ_{ES}	δ_{MV}	δ_p	δ_A	$\delta_{\beta TSE}$	δ_{SE}	$\delta_{\beta US}$	R^2 adj	F-prob
Coeff.	4.256	-1.789	-0.715	-0.178	-218.0	0.739	0.432	0.232		
p-value	(0.004) ***	(0.001) ***	(0.001 ***	(0.32) **	(0.041) **	(0.001) ***	(0.16)	(0.061) *	0.613	0.002

Table 2-9 (Continued)

Panel A2: Share trades executed on AMEX

Coeff.	1.164	-1.376	-0.460	-0.305	-537.7	1.619	0.419	-0.583	0.240	0.136
p-value	(0.897)	(0.133)	(0.286)	(0.538)	(0.109)	(0.368)	(0.79)	(0.259)		

Panel A3: Ratios of share trades executed on the AMEX and TSE

	Const.	*RES*	*MV*	*P*	*RA*	$R\beta^{TSE}$	*RSE*	$R\beta^{US}$		
	α'_0	δ_{RES}	δ_{MV}	δ_p	δ_{RA}	$\delta_{R\beta TSE}$	δ_{RSE}	$\delta_{R\beta US}$	R^2 adj	F-prob
Coeff.	-0.451	0.899	-0.257	1.413	0.199	0.220	4.174	-0.049	0.309	0.083
p-value	(0.795)	(0.285)	(0.561)	(0.028) **	(0.019) **	(0.796)	(0.00) **	(0.591)		

Panel B: TSE Canadian shares cross-listed on NASDAQ

Panel B1: Share trades executed on the TSE

	Const.	*ES*	*MV*	*P*	*A*	β^{TSE}	*SE*	β^{US}		
	α_0	δ_{ES}	δ_{MV}	δ_p	δ_A	$\delta_{\beta TSE}$	δ_{SE}	$\delta_{\beta US}$	R^2 adj	F-prob
Coeff.	2.680	-1.707	-0.358	-0.418	-29.220	0.265	0.314	-0.019		
p-value	(0.007) ***	(0) ***	(0.005) ***	(0.004) ***	0.617	(0.076) *	(0.09) *	(0.679)	0.519	0

Panel B2: Share trades executed on NASDAQ

Coeff.	0.136	-3.114	-1.213	-0.325	39.104	-0.410	1.344	-0.222		
p-value	(0) ***	(0) ***	(0) ***	(0.289)	(0.675)	(0.303)	(0.02) ***	(0.137)	0.625	0.000

Panel B3: Ratios of share trades executed on the NASDAQ and TSE.

	Const.	*RES*	*MV*	*P*	*RA*	$R\beta^{TSE}$	*RSE*	$R\beta^{US}$		
	α'_0	δ_{RES}	δ_{MV}	δ_p	δ_A	$\delta_{R\beta TSE}$	δ_{RSE}	$\delta_{R\beta US}$	R^2 adj	F-prob
Coeff.	-3.215	2.905	0.463	-0.051	-0.005	0.409	-0.73	0.134		
p-value	(0.001) ***	(0) ***	(0.043) **	(0.893)	(0) ***	(0.213)	(0.02) **	(0.001) ***	0.669	0.000

Table 2-9 (Continued)

Panel C: TSE Canadian shares cross-listed on NYSE with(out) options traded on them

Panel C1: Share trades executed on the TSE

	Const.	*ES*	*MV*	*P*	*A*	β^{TSE}	*SE*	β^{US}	*ES* NOP*	*MV* NOP*	*P* NOP*	*A* NOP*	β^{TSE}* *NOP*	*SE* NOP*	β^{US}* *NOP*		
		α_1	α_2	α_3	α_4	α_5	α_6	α_7	δ_{ES}	δ_{MV}	δ_p	δ_A	$\delta_{\beta TSE}$	δ_{SE}	$\delta_{\beta US}$	R^2 adj	F-prob
Coeff.	1.026	-1.955	-0.373	-0.545	118.600	0.670	0.051	0.301	0.726	0.428	0.041	-256.01	-0.528	0.367	-0.326		
p-value	(0.431)	(0) ***	(0.022) **	(0.00) ***	(0.123)	(0.0005) ***	(0.77)	(0.036) **	(0.024) **	(0.012) **	(0.859)	(0.132)	(0.02) **	(0.06) *	(0.06) *	0.775	0

Panel C2: Share trades executed on the NYSE with(out) options traded on them

	Const.	*ES*	*MV*	*P*	*A*	β^{TSE}	*SE*	β^{US}	*ES* NOP*	*MV* NOP*	*P* NOP*	*A* NOP*	β^{TSE}* *NOP*	*SE* NOP*	β^{US}* *NOP*	R^2 adj	F-prob
Coeff.	2.939	-3.598	-0.372	-1.814	-513.5	1.913	0.161	0.398	1.521	-0.085	0.691	289.9	-1.574	-0.009	-0.516		
p-value	(0.304)	(0.004) ***	(0.062) *	(0.094) *	(0.001) ***	(0.056) *	(0.55)	(0.005) ***	(0.25)	(0.79))	(0.541)	(0.240)	(0.125)	(0.984)	(0.127)	0.34	0.006

Panel C3: Ratios of share trades executed on the NYSE with(out) options traded on them and TSE.

	Const.	*RES*	*MV*	*P*	*RA*	$R\beta^{TSE}$	*RSE*	$R\beta^{US}$	*RES* NOP*	*MV* NOP*	*P*NOP*	*RA* NOP*	$R\beta^{TSE}$ **NOP*	*RSE* NOP*	$R\beta^{US}$* *NOP*		
	α'_0	α'_1	α'_2	α'_3	α'_4	α'_5	α'_6	α'_7	δR_{ES}	δ_{MV}	δ_p	δ_{RA}	$\delta_{R\beta TSE}$	δR_{SE}	$\delta_{R\beta US}$		
Coeff.	-1.167	1.852	0.049	0.304	-0.050	-0.038	1.254	-0.013	-0.115	0.289	-0.117	0.031	-0.838	-0.821	0.074		
p-value	(0.509)	(0.002) ***	(0.888)	(0.563)	(0.022) ***	(0.776)	(0) ***	(0.745)	(0.880)	(0.569)	(0.926)	(0.678)	(0.236)	(0.225)	(0.278)	0.372	0.003

Table 3-1

Summary of relevant theoretical and associated empirical studies showing whether the price impact of the announcement of equity seasoned offerings is due to asymmetric information (firm-originated) in: (1) intrinsic firm value, (2) cash flow, (3) planned investment, and (4) growth opportunities. Alternatively, if it is non-firm related information consistent with: (5) finite price elasticity of demand or (6) price pressure. It also reports the expected relationship between the price reaction at the announcement (issue) date and the size of the equity offering.

Theory (Authors)	Description	Empirical study by	Firm Info.	Relation of price reaction at the announcement (issue) date and offering Size
1. Asymmetric information in intrinsic firm value (Myers and Majluf, 1984).	Managers are more informed than investors are. The lower the information asymmetry, the lower the price impact.	Scholes (1972), Mikkelson and Partch (1985), Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986), Kalay and Shimrat (1987), Korajczyk et al. (1990), Tripathy and Rao (1992), Hudson et al. (1993), Choe et al. (1993), Jog and Schaller (1993) Bayles and Chaplinski (1996) and Mittoo (1997)	Yes	Negative
2. Asymmetric information in firm's cash flow (Miller and Rock, 1985).	Equity offering signals unexpected planned cash flow.		Yes	Negative
3. Agency, overinvestment Jensen (1986), (Jensen and Meckling, 1986), Zwiebel (1996).	Equity offerings instead of debt offerings signal overinvestment such that managers extract private rents.	De Jong and Veld (1999).	Yes	Negative
4. Growth opportunities. (Viswanath, 1993; Cooney and Kalay, 1993).	Growth firms are more likely to have positive (less negative) price impact.	Kryzanowski and Rakita (2000) and Jung, Kim, and Stulz (1996).	Yes	None
5. Finite price elasticity of demand (Allen and Postlewaite, 1984; Bagwell, 1991).	No evidence of adverse firm information.	Loderer et al. (1991a), Loderer et al. (1991b), Asquith and Mullins (1993), Hudson et al. (1993). Galloway et al. (1998) and Chaplinski and Ramchand (2000).	No	Negative
6. Price pressure. (Barclay and Litzenberger, 1988).	Price decline relates to the discount to compensate transaction costs to investors.	Barclay and Litzenberger (1988), Mittoo (1997)	No	None

Table 3-2

This table reports the cumulative average abnormal returns (CAAR) for different event window periods around the announcement and issue dates of *Domestic* seasoned Canadian cross-listed shares on the *NYSE/AMEX* and *NASDAQ*. The regression used is based on the following IAPM:

$$R_{it} = a_i + b_i R^{TSE}_{mt} + c_i R^{US}_{mt} + d_i R^{TSE}_{mt}*DI + e_i R^{US}_{mt}*DI + \gamma_{1i} DCAR_t + \gamma_{2i} DAD_t + \gamma_{3i} DINT_t + \gamma_{4i} DID_t + \gamma_{5i} DPOST_t + \varepsilon_{it}$$

R_{it} is the rate of return in excess of the Canadian daily risk-free rate (one month Canada T-bill rate) for firm *i*. R^{TSE}_{mt} is the TSE300 market return premium and is equal to the daily TSE300 market return minus the Canadian daily risk-free rate. R^{US}_{mt} is the CRSP market return premium and is equal to the difference between the CRSP market return and the U.S. daily risk-free rate (one month U.S. T-bill rate). The R^{US}_{mt} is orthogonalized to the R^{TSE}_{mt}. The dummy variable *DI* is the dummy beta shift that takes the value of one over the period one day after the announcement day (AD) and ending 25 days after the issue day, that is [AD-1, ID+25], and is zero otherwise. The dummy variable $DCAR_t$ corresponds to the pre-announcement window period, and takes the value of one over the period starting 25 days before the announcement date and ending two days before the announcement date, [AD-25, AD-2], and is zero otherwise. DAD_t is a dummy variable that equals one on the three-day announcement date, [AD-1, AD+1], and is zero otherwise. $DINT_t$ is equal to one in the interim period starting two days after the announcement date and ending two days before the issue date, [AD+2, ID-2], and is zero otherwise. DID_t is a dummy variable that equals one on the three-day issue date, [ID-1, ID+1], and is zero otherwise. $DPOST_t$ takes the value of one from the period starting two days after the issue date and ending 25 days after the issue date, [ID+2, ID+25], and is zero otherwise. The parameters $\gamma_{1i}, \ldots, \gamma_{5i}$ are the abnormal returns generated for each trading day through the event window periods for firm *i*. For example, $3\gamma_{2i}$ is the cumulative abnormal return for the 3-day announcement date for firm *i* and is equal to a CAAR of -0.0086. When the dummy variable takes on a value of one over T days, the T-day cumulative abnormal return is $T\gamma_{3i}$. For the interim period, *DINT*, T differs across firms, and the average estimate of $T\gamma_{3i}$ is computed by multiplying each individual γ_3 by the T days in firm's *i* interim period. The average time period T is 11.2 days. The estimation window period in the sample starts from 200 trading days prior to the announcement day, and ends 75 trading days after the issue day. Panel A reports the CAAR for the five window periods. Panel B reports the average abnormal returns for each of the 10 days before and after the announcement (issue) date and the CAAR for the other window periods. The statistical significance of the coefficients is given by their Z-values. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively. N indicates the number of SEOs.

Panel A: Estimates of TSE (U.S.) market betas, beta shifts, and CAAR before, during, and after the announcement (issue) dates. (N=116)

Variable	Coefficient	Event Period	Avg. Estimate	% Positive	5% percent level of significance		10% percent level of significance		Z-value
					Positive	Negative	Positive	Negative	
Constant	*a*		0.0010	65.5	10.3	0.9	13.8	5.2	3.40 ***
R^{TSE}_{mt}	*b*		0.7980	89.7	50.9	0.9	56.0	0.9	10.65 ***
R^{US}_{mt}	*c*		-0.1247	47.4	4.3	12.9	7.8	14.7	-1.78 *
$R^{TSE}_{mt}*DI$	*d*		0.1125	52.6	8.6	1.7	11.2	5.2	1.46
$R^{US}_{mt}*DI$	*e*		-0.0737	50.0	3.4	6.0	5.2	8.6	-0.82
DCAR	$24\gamma_1$	[AD-25, AD-2]	0.0869	72.4	8.6	2.6	16.4	5.2	5.16 ***
DAD	$3\gamma_2$	[AD-1, AD+1]	-0.0086	33.6	18.1	31.9	19.0	35.3	-1.50
DINT	$T\gamma_3$	[AD+2, ID-2]	-0.0034	43.4	12.4	8.8	12.4	13.3	-0.30
DID	$3\gamma_4$	[ID-1, ID+1]	0.0024	53.1	22.1	19.5	26.5	22.1	0.42
DPOST	$24\gamma_5$	[ID+2, ID+25]	-0.0207	40.5	3.4	3.4	5.2	10.3	-1.59

Table 3-2 (Continued)

Panel B: Daily average abnormal returns before and after the announcement (issue) dates and CAAR for the other window periods.

Announcement Date (a)				Issue Date (b)			
Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value	Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value
-25, -11	0.0562	62.9	3.68 ***	-25, -11	0.0259	56.0	2.07 **
-10, -2	0.0332	68.1	4.02 ***	-10, -2	-0.0099	36.2	-1.26
-10	0.0033	48.3	0.93	-10	-0.0040	41.4	-1.27
-9	0.0030	59.5	1.06	-9	0.0001	50.9	0.06
-8	0.0055	55.2	1.47	-8	0.0036	55.2	1.40
-7	0.0003	50.9	0.10	-7	0.0031	44.8	1.27
-6	0.0018	52.6	0.73	-6	-0.0007	48.3	-0.32
-5	0.0048	51.7	1.97 **	-5	0.0003	42.2	0.09
-4	0.0068	56.0	2.40 **	-4	-0.0001	38.8	-0.05
-3	0.0014	47.4	0.46	-3	-0.0087	28.4	-3.81 ***
-2	0.0069	58.6	2.00 **	-2	-0.0023	37.1	-0.69
-1	0.0032	48.3	0.94	-1	-0.0018	42.2	-0.69
0	-0.0014	45.7	-0.40	0	0.0003	46.6	0.08
+1	-0.0091	35.3	-3.06 ***	+1	0.0010	41.4	0.36
+2	0.0017	50.0	0.76	+2	0.0021	44.8	0.72
+3	-0.0032	41.4	-1.59	+3	-0.0007	47.4	-0.22
+4	0.0035	49.1	1.48	+4	0.0070	56.0	2.09 **
+5	0.0025	49.1	1.07	+5	-0.0029	46.6	-1.06
+6	0.0003	48.3	0.19	+6	-0.0023	44.8	-0.99
+7	-0.0025	42.2	-1.39	+7	-0.0024	44.8	-0.96
+8	-0.0038	31.0	-1.36	+8	-0.0046	41.4	-1.63
+9	0.0024	44.8	0.68	+9	0.0020	46.6	0.65
+10	-0.0031	40.5	-0.85	+10	-0.0032	49.1	-0.99
+2, +10	-0.0055	36.2	-0.70	+2, +10	-0.0037	41.4	-0.42
+11, +25	-0.0023	45.7	-0.19	+11, +25	-0.0231	39.7	-2.47 **

(a) Day 0 is the day of the announcement of the domestic seasoned offering.
(b) Day 0 is the issue day of the domestic seasoned offering.

Table 3-3

This table reports the cumulative average abnormal returns (CAAR) for different event window periods around the announcement and issue dates of *International* seasoned Canadian cross-listed shares on the *NYSE, AMEX* and *NASDAQ*. The regression used is based on the following IAPM:

$$R_{it} = a_i + b_i R^{TSE}_{mt} + c_i R^{US}_{mt} + d_i R^{TSE}_{mt}*DI + e_i R^{US}_{mt}*DI + \gamma_{1i} DCAR_t + \gamma_{2i} DAD_t + \gamma_{3i} DINT_t + \gamma_{4i} DID_t + \gamma_{5i} DPOST_t + \varepsilon_{it}$$

R_{it} is the rate of return in excess of the Canadian daily risk-free rate (one month Canada T-bill rate) for firm *i*. R^{TSE}_{mt} is the TSE300 market return premium and is equal to the daily TSE300 market return minus the Canadian daily risk-free rate. R^{US}_{mt} is the CRSP market return premium and is equal to the difference between the CRSP market return and the U.S. daily risk-free rate (one month U.S. T-bill rate). The R^{US}_{mt} is orthogonalized to the R^{TSE}_{mt}. The dummy variable *DI* is the dummy beta shift that takes the value of one over the period one day after the announcement day (AD) and ending 25 days after the issue day, that is [AD-1, ID+25], and is zero otherwise. The dummy variable $DCAR_t$ corresponds to the pre-announcement window period, and takes the value of one over the period starting 25 days before the announcement date and ending two days before the announcement date, [AD-25, AD-2], and is zero otherwise. DAD_t is a dummy variable that equals one on the three-day announcement date, [AD-1, AD+1], and is zero otherwise. $DINT_t$ is equal to one in the interim period starting two days after the announcement date and ending two days before the issue date, [AD+2, ID-2], and is zero otherwise. DID_t is a dummy variable that equals one on the three-day issue date, [ID-1, ID+1], and is zero otherwise. $DPOST_t$ takes the value of one from the period starting two days after the issue date and ending 25 days after the issue date, [ID+2, ID+25], and is zero otherwise. The parameters $\gamma_{1i}, \ldots, \gamma_{5i}$ are the abnormal returns generated for each trading day through the event window periods for firm *i*. For example, $3\gamma_{2i}$ is the cumulative abnormal return for the 3-day announcement date for firm *i* and is equal to a CAAR of -0.0199. When the dummy variable takes on a value of one over T days, the T-day cumulative abnormal return is $T\gamma_{3i}$. For the interim period, *DINT*, T differs across firms, and the average estimate of $T\gamma_{3i}$ is computed by multiplying each individual γ_i by the T days in firm's *i* interim period. The average time period T is 15.2 days. The estimation window period in the sample starts from 200 trading days prior to the announcement day, and ends 75 trading days after the issue day. Panel A reports the CAAR for the five window periods. Panel B reports the average abnormal returns for each of the 10 days before and after the announcement (issue) date and the CAAR for the other window periods. The statistical significance of the coefficients is given by their Z-values. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively. N indicates the number of SEOs.

Panel A: Estimates of TSE (U.S.) market betas, beta shifts, and CAAR before, during, and after the announcement (issue) dates. (N= 42)

Variable	Coefficient	Event Period	Avg. Estimate	% Positive	5% percent level of significance Positive	5% percent level of significance Negative	10% percent level of significance Positive	10% percent level of significance Negative	Z-value
Constant	*a*		0.0015	73.8	11.9	2.4	28.6	2.4	4.22 ***
R^{TSE}_{mt}	*b*		0.9192	97.6	73.8	0.0	76.2	0.0	10.2 ***
R^{US}_{mt}	*c*		0.0738	57.1	19.0	11.9	23.8	14.3	0.50
$R^{TSE}_{mt}*DI$	*d*		0.2038	66.7	9.5	9.5	21.4	11.9	1.39
$R^{US}_{mt}*DI$	*e*		0.0977	57.1	4.8	2.4	7.1	4.8	0.78
DCAR	$24\gamma_1$	[AD-25, AD-2]	0.0205	50.0	2.4	0.0	4.8	0.0	1.11
DAD	$3\gamma_2$	[AD-1, AD+1]	-0.0199	40.5	9.5	33.3	11.9	38.1	-2.78 ***
DINT	$T\gamma_3$	[AD+2,ID-2]	-0.0050	45.2	11.9	14.3	19.0	16.7	-0.25
DID	$3\gamma_4$	[ID-1, ID+1]	0.0144	57.1	31.0	19.0	40.5	19.0	1.65 *
DPOST	$24\gamma_5$	[ID+2, ID+25]	-0.0522	45.2	2.4	9.5	2.4	19.0	-2.21 **

Table 3-3 (Continued)

Panel B: Daily average abnormal returns before and after the announcement (issue) dates and CAAR for the other window periods.

Announcement Date (a)				Issue Date (b)			
Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value	Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value
-25, -11	-0.0157	38.1	-1.07	-25, -11	-0.0047	42.9	-0.36
-10, -2	0.0381	57.1	2.33 **	-10, -2	0.0197	54.8	1.06
-10	0.0050	59.5	1.15	-10	-0.0036	45.2	-0.81
-9	-0.0015	40.5	-0.31	-9	0.0051	59.5	0.77
-8	0.0039	50.0	0.98	-8	0.0000	42.9	0.00
-7	0.0057	54.8	1.74 *	-7	0.0040	61.9	1.17
-6	-0.0013	38.1	-0.28	-6	-0.0109	38.1	-1.64
-5	0.0062	52.4	1.55	-5	0.0022	52.4	0.44
-4	0.0078	57.1	1.72 *	-4	0.0069	57.1	1.61
-3	0.0032	47.6	0.78	-3	0.0096	61.9	1.94 *
-2	0.0091	42.9	1.18	-2	0.0049	38.1	0.66
-1	-0.0059	40.5	-1.31	-1	0.0103	61.9	2.13 **
0	-0.0081	31.0	-1.33	0	-0.0012	47.6	-0.28
+1	-0.0057	35.7	-1.24	+1	0.0049	42.9	1.04
+2	0.0051	52.4	1.36	+2	0.0012	59.5	0.30
+3	-0.0046	42.9	-0.95	+3	-0.0035	45.2	-0.94
+4	-0.0015	47.6	-0.31	+4	-0.0020	40.5	-0.51
+5	0.0031	54.8	0.75	+5	-0.0020	47.6	-0.59
+6	0.0005	59.5	0.13	+6	0.0003	52.4	0.06
+7	-0.0024	42.9	-0.78	+7	0.0039	57.1	0.98
+8	0.0000	54.8	0.00	+8	0.0010	47.6	0.21
+9	0.0012	50.0	0.39	+9	-0.0040	35.7	-1.12
+10	0.0039	59.5	1.00	+10	-0.0002	45.2	-0.04
+2, +10	0.0053	47.6	0.52	+2, +10	-0.0078	35.7	-0.72
+11, +25	-0.0162	45.2	-0.88	+11, +25	-0.0337	45.2	-1.37

(a) Day 0 is the day of the announcement of the domestic seasoned offering.
(b) Day 0 is the issue day of the domestic seasoned offering.

Table 3-4

This table reports the cumulative average abnormal returns (CAAR) for different event window periods around the announcement and issue dates of *Domestic* seasoned Canadian cross-listed shares on the *NASDAQ*. The regression used is based on the following IAPM:

$$R_{it} = a_i + b_i R^{TSE}_{mt} + c_i R^{US}_{mt} + d_i R^{TSE}_{mt}{*}DI + e_i R^{US}_{mt}{*}DI + \gamma_{1i} DCAR_t + \gamma_{2i} DAD_t + \gamma_{3i} DINT_t + \gamma_{4i} DID_t + \gamma_{5i} DPOST_t + \varepsilon_{it}$$

R_{it} is the rate of return in excess of the Canadian daily risk-free rate (one month Canada T-bill rate) for firm *i*. R^{TSE}_{mt} is the TSE300 market return premium and is equal to the daily TSE300 market return minus the Canadian daily risk-free rate. R^{US}_{mt} is the CRSP market return premium and is equal to the difference between the CRSP market return and the U.S. daily risk-free rate (one month U.S. T-bill rate). The R^{US}_{mt} is orthogonalized to the R^{TSE}_{mt}. The dummy variable *DI* is the dummy beta shift that takes the value of one over the period one day after the announcement day (AD) and ending 25 days after the issue date, that is [AD-1, ID+25], and is zero otherwise. The dummy variable $DCAR_t$ corresponds to the pre-announcement window period, and takes the value of one over the period starting 25 days before the announcement day and ending two days before the announcement date, [AD-25, AD-2], and is zero otherwise. DAD_t is a dummy variable that equals one on the three-day announcement date, [AD-1, AD+1], and is zero otherwise. $DINT_t$ is equal to one in the interim period starting two days after the announcement date and ending two days before the issue date, [AD+2, ID-2], and is zero otherwise. DID_t is a dummy variable that equals one on the three-day issue date, [ID-1, ID+1], and is zero otherwise. $DPOST_t$ takes the value of one from the period starting two days after the issue date and ending 25 days after the issue date, [ID+2, ID+25], and is zero otherwise. The parameters $\gamma_{1i}, \ldots, \gamma_{5i}$ are the abnormal returns generated for each trading day through the event window periods for firm *i*. For example, $3\gamma_{2i}$ is the cumulative abnormal return for the 3-day announcement date for firm *i* and is equal to a CAAR of -0.0042. When the dummy variable takes on a value of one over T days, the T-day cumulative abnormal return is $T\gamma_{3i}$. For the interim period, *DINT*, T differs across firms, and the average estimate of $T\gamma_{3i}$ is computed by multiplying each individual γ_i by the T days in firm's *i* interim period. The average time period T is 10.7days. The estimation window period in the sample starts from 200 trading days prior to the announcement day, and ends 75 trading days after the issue day. Panel A reports the CAAR for the five window periods. Panel B reports the average abnormal returns for each of the 10 days before and after the announcement (issue) date and the CAAR for other window periods. The statistical significance of the coefficients is given by their Z-value. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively. N indicates the number of SEOs.

Panel A: Estimates of TSE (U.S.) market betas, beta shifts, and CAAR before, during, and after the announcement (issue) dates. (N= 54)

Variable	Coefficient	Event Period	Avg. Estimate	% Positive	5% level of significance: Positive	5% level of significance: Negative	10% level of significance: Positive	10% level of significance: Negative	Z-value
Constant	*a*		0.0009	63.0	9.3	0.0	11.1	3.7	2.27 **
R^{TSE}_{mt}	*b*		0.6458	85.2	44.4	0.0	48.1	0.0	6.15 ***
R^{US}_{mt}	*c*		0.0333	55.6	5.6	7.4	11.1	7.4	0.33
$R^{TSE}_{mt}{*}DI$	*d*		0.0479	50.0	5.6	0.0	9.3	3.7	0.40
$R^{US}_{mt}{*}DI$	*e*		-0.2268	44.4	0.0	11.1	0.0	14.8	-1.54
DCAR	$24\gamma_1$	[AD-25, AD-2]	0.0993	81.5	7.4	0.0	14.8	1.9	4.34 ***
DAD	$3\gamma_2$	[AD-1, AD+1]	-0.0042	37.0	24.1	25.9	25.9	27.8	-0.48
DINT	$T\gamma_3$	[AD+2, ID-2]	-0.0093	43.4	11.3	7.5	11.3	13.2	-0.78
DID	$3\gamma_4$	[ID-1, ID+1]	-0.0043	50.9	18.9	28.3	22.6	30.2	-0.43
DPOST	$24\gamma_5$	[ID+2, ID+25]	-0.0244	37.0	1.9	3.7	3.7	13.0	-1.09

Table 3-4 (Continued)

Panel B: Daily average abnormal returns before and after the announcement (issue) dates and CAAR for the other window periods.

Announcement Date (a)				Issue Date (b)			
Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value	Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value
-25, -11	0.0672	66.7	2.78 ***	-25, -11	0.0545	61.1	2.86 ***
-10, -2	0.0355	64.8	2.54 **	-10, -2	-0.0091	33.3	-0.84
-10	-0.0013	48.1	-0.33	-10	0.0013	50.0	0.23
-9	0.0046	66.7	0.94	-9	-0.0017	44.4	-0.48
-8	0.0117	57.4	1.86 *	-8	0.0015	44.4	0.37
-7	-0.0004	48.1	-0.09	-7	0.0011	42.6	0.34
-6	-0.0018	48.1	-0.46	-6	-0.0039	42.6	-1.20
-5	0.0080	59.3	2.48 **	-5	0.0032	51.9	0.66
-4	0.0017	44.4	0.38	-4	-0.0013	35.2	-0.37
-3	0.0032	46.3	0.57	-3	-0.0086	33.3	-2.01 **
-2	0.0086	57.4	1.59	-2	-0.0023	40.7	-0.39
-1	0.0004	50.0	0.08	-1	-0.0036	29.6	-0.80
0	0.0054	59.3	1.03	0	-0.0003	51.9	-0.04
+1	-0.0101	37.0	-2.03 **	+1	-0.0061	40.7	-1.48
+2	0.0033	51.9	1.17	+2	0.0050	40.7	0.93
+3	-0.0074	31.5	-2.49 **	+3	0.0003	51.9	0.06
+4	0.0026	46.3	0.62	+4	0.0122	57.4	1.88 *
+5	-0.0011	44.4	-0.38	+5	-0.0041	46.3	-0.92
+6	0.0022	53.7	0.71	+6	-0.0101	31.5	-2.75 ***
+7	-0.0029	38.9	-0.97	+7	0.0007	50.0	0.16
+8	-0.0062	27.8	-1.32	+8	-0.0083	40.7	-1.57
+9	0.0069	51.9	1.01	+9	0.0032	38.9	0.60
+10	-0.0054	38.9	-0.79	+10	-0.0050	46.3	-0.85
+2, +10	-0.0105	31.5	-0.78	+2, +10	-0.0043	37.0	-0.26
+11, +25	-0.0062	42.6	-0.30	+11, +25	-0.0262	38.9	-1.80 *

(a) Day 0 is the day of the announcement of the global seasoned offering.
(b) Day 0 is the issue day of the global seasoned offering.

Table 3-5

This table reports the cumulative average abnormal returns (CAAR) for different event window periods around the announcement and issue dates of *Domestic* seasoned Canadian cross-listed shares on the *NYSE/AMEX*. The regression used is based on the following IAPM:

$$R_{it} = a_i + b_i R^{TSE}_{mt} + c_i R^{US}_{mt} + d_i R^{TSE}_{mt}{*}DI + e_i R^{US}_{mt}{*}DI + \gamma_{1i} DCAR_t + \gamma_{2i} DAD_t + \gamma_{3i} DINT_t + \gamma_{4i} DID_t + \gamma_{5i} DPOST_t + \varepsilon_{it}$$

R_{it} is the rate of return in excess of the Canadian daily risk-free rate (one month Canada T-bill rate) for firm *i*. R^{TSE}_{mt} is the TSE300 market return premium and is equal to the daily TSE300 market return minus the Canadian daily risk-free rate. R^{US}_{mt} is the CRSP market return premium and is equal to the difference between the CRSP market return and the U.S. daily risk-free rate (one month U.S. T-bill rate). The R^{US}_{mt} is orthogonalized to the R^{TSE}_{mt}. The dummy variable DI is the dummy beta shift that takes the value of one over the period one day after the announcement day (AD) and ending 25 days after the issue date, that is [AD-1, ID+25], and is zero otherwise. The dummy variable $DCAR_t$ corresponds to the pre-announcement window period, and takes the value of one over the period starting 25 days before the announcement day and ending two days before the announcement date, [AD-25, AD-2], and is zero otherwise. DAD_t is a dummy variable that equals one on the three-day announcement date, [AD-1, AD+1], and is zero otherwise. $DINT_t$ is equal to one in the interim period starting two days after the announcement date and ending two days before the issue date, [AD+2, ID-2], and is zero otherwise. DID_t is a dummy variable that equals one on the three-day issue date, [ID-1, ID+1], and is zero otherwise. $DPOST_t$ takes the value of one from the period starting two days after the issue date and ending 25 days after the issue date, [ID+2, ID+25], and is zero otherwise. The parameters $\gamma_{1i}, \ldots, \gamma_{5i}$ are the abnormal returns generated for each trading day through the event window periods for firm *i*. For example, $3\gamma_{2i}$ is the cumulative abnormal return for the 3-day announcement date for firm *i* and is equal to a CAAR of -0.0124. When the dummy variable takes on a value of one over T days, the T-day cumulative abnormal return is $T\gamma_{3i}$. For the interim period, $DINT$, T differs across firms, and the average estimate of $T\gamma_{4i}$ is computed by multiplying each individual γ_3 by the T days in firm's *i* interim period. The average time period T is 11.5days. The estimation window period in the sample starts from 200 trading days prior to the announcement day, and ends 75 trading days after the issue day. Panel A reports the CAAR for the five window periods. Panel B reports the average abnormal returns for each of the 10 days before and after the announcement (issue) date and the CAAR for other window periods. The statistical significance of the coefficients is given by their Z-value. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively. N indicates the number of SEOs.

Panel A: Estimates of TSE (U.S.) market betas, beta shifts, and CAAR before, during, and after the announcement (issue) dates. (N=62)

					5% level of significance		10% level of significance		
Variable	Coefficient	Event Period	Avg. Estimate	% Positive	Positive	Negative	Positive	Negative	Z-value
Constant	*a*		0.0010	67.7	11.3	1.6	16.1	6.5	2.51 **
R^{TSE}_{mt}	*b*		0.9305	93.5	56.5	1.6	62.9	1.6	8.94 ***
R^{US}_{mt}	*c*		-0.2622	40.3	3.2	17.7	4.8	21.0	-2.8 ***
$R^{TSE}_{mt}{*}DI$	*d*		0.1687	54.8	11.3	3.2	12.9	6.5	1.68 *
$R^{US}_{mt}{*}DI$	*e*		0.0597	54.8	6.5	1.6	9.7	3.2	0.56
DCAR	$24\gamma_1$	[AD-25, AD-2]	0.0762	64.5	9.7	4.8	17.7	8.1	3.10 ***
DAD	$3\gamma_2$	[AD-1, AD+1]	-0.0124	30.6	12.9	37.1	12.9	41.9	-1.65 *
DINT	$T\gamma_3$	[AD+2,ID-2]	0.0018	43.3	13.3	10.0	13.3	13.3	0.10
DID	$3\gamma_4$	[ID-1, ID+1]	0.0083	55.0	25.0	11.7	30.0	15.0	1.45
DPOST	$24\gamma_5$	[ID+2, ID+25]	-0.0175	43.5	4.8	3.2	6.5	8.1	-1.19

Table 3-5 (Continued)

Panel B: Daily average abnormal returns before and after the announcement (issue) dates and CAAR for the other window periods.

Announcement Date (a)				Issue Date (b)			
Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value	Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value
-25, -11	0.0466	59.7	2.40 **	-25, -11	0.0010	51.6	0.06
-10, -2	0.0311	71.0	3.24 ***	-10, -2	-0.0107	38.7	-0.93
-10	0.0073	48.4	1.26	-10	-0.0085	33.9	-2.66 ***
-9	0.0016	53.2	0.51	-9	0.0017	56.5	0.54
-8	0.0002	53.2	0.04	-8	0.0054	64.5	1.67 *
-7	0.0009	53.2	0.24	-7	0.0047	46.8	1.37
-6	0.0050	56.5	1.64	-6	0.0021	53.2	0.77
-5	0.0020	45.2	0.56	-5	-0.0023	33.9	-0.67
-4	0.0112	66.1	3.25 ***	-4	0.0009	41.9	0.36
-3	-0.0002	48.4	-0.07	-3	-0.0088	24.2	-4.06 ***
-2	0.0053	59.7	1.22	-2	-0.0022	33.9	-0.69
-1	0.0056	46.8	1.42	-1	-0.0003	53.2	-0.09
0	-0.0074	33.9	-1.59	0	0.0008	41.9	0.21
+1	-0.0082	33.9	-2.34 **	+1	0.0071	41.9	2.08 **
+2	0.0003	48.4	0.09	+2	-0.0005	48.4	-0.20
+3	0.0004	50.0	0.13	+3	-0.0016	43.5	-0.50
+4	0.0043	51.6	1.67 *	+4	0.0025	54.8	0.93
+5	0.0056	53.2	1.58	+5	-0.0018	46.8	-0.55
+6	-0.0013	43.5	-0.71	+6	0.0045	56.5	1.73 *
+7	-0.0022	45.2	-0.99	+7	-0.0051	40.3	-1.84 *
+8	-0.0017	33.9	-0.51	+8	-0.0014	41.9	-0.55
+9	-0.0014	38.7	-0.48	+9	0.0009	53.2	0.27
+10	-0.0011	41.9	-0.32	+10	-0.0016	51.6	-0.51
+2, +10	-0.0011	40.3	-0.12	+2, +10	-0.0033	45.2	-0.38
+11, +25	0.0012	48.4	0.09	+11, +25	-0.0205	40.3	-1.68 *

(a) Day 0 is the day of the announcement of the global seasoned offering.
(b) Day 0 is the issue day of the global seasoned offering.

Table 3-6

This table reports the cumulative average abnormal returns (CAAR) for different event window periods around the announcement and issue dates of *International* seasoned Canadian cross-listed shares on the *NASDAQ*. The regression used is based on the following IAPM:

$$R_{it} = a_i + b_i R^{TSE}_{mt} + c_i R^{US}_{mt} + d_i R^{TSE}_{mt}{*}DI + e_i R^{US}_{mt}{*}DI + \gamma_{1i} DCAR_t + \gamma_{2i} DAD_t + \gamma_{3i} DINT_t + \gamma_{4i} DID_t + \gamma_{5i} DPOST_t + \varepsilon_{it}$$

R_{it} is the rate of return in excess of the Canadian daily risk-free rate (one month Canada T-bill rate) for firm *i*. R^{TSE}_{mt} is the TSE300 market return premium and is equal to the daily TSE300 market return minus the Canadian daily risk-free rate. R^{US}_{mt} is the CRSP market return premium and is equal to the difference between the CRSP market return and the U.S. daily risk-free rate (one month U.S. T-bill rate). The R^{US}_{mt} is orthogonalized to the R^{TSE}_{mt}. The dummy variable *DI* is the dummy beta shift that takes the value of one over the period one day after the announcement day (AD) and ending 25 days after the issue date, that is [AD-1, ID+25], and is zero otherwise. The dummy variable $DCAR_t$ corresponds to the pre-announcement window period, and takes the value of one over the period starting 25 days before the announcement day and ending two days before the announcement date, [AD-25, AD-2], and is zero otherwise. DAD_t is a dummy variable that equals one on the three-day announcement date, [AD-1, AD+1], and is zero otherwise. $DINT_t$ is equal to one in the interim period starting two days after the announcement date and ending two days before the issue date, [AD+2, ID-2], and is zero otherwise. DID_t is a dummy variable that equals one on the three-day issue date, [ID-1, ID+1], and is zero otherwise. $DPOST_t$ takes the value of one from the period starting two days after the issue date and ending 25 days after the issue date, [ID+2, ID+25], and is zero otherwise. The parameters $\gamma_{1i}, \ldots, \gamma_{5i}$ are the abnormal returns generated for each trading day through the event window periods for firm *i*. For example, $3\gamma_{2i}$ is the cumulative abnormal return for the 3-day announcement date for firm *i* and is equal to a CAAR of -0.025. When the dummy variable takes on a value of one over T days, the T-day cumulative abnormal return is $T\gamma_{ji}$. For the interim period, *DINT*, T differs across firms, and the average estimate of $T\gamma_{3i}$ is computed by multiplying each individual γ_3 by the T days in firm's *i* interim period. The average time period T is 19.1days. The estimation window period in the sample starts from 200 trading days prior to the announcement day, and ends 75 trading days after the issue day. Panel A reports the CAAR for the five window periods. Panel B reports the average abnormal returns for each of the 10 days before and after the announcement (issue) date and the CAAR for other window periods. The statistical significance of the coefficients is given by their Z-value. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively. N indicates the number of SEOs.

Panel A: Estimates of TSE (U.S.) market betas, beta shifts, and CAAR before, during, and after the announcement (issue) dates. (N=16)

Variable	Coefficient	Event Period	Avg. Estimate	% Positive	5% level of significance Positive	5% level of significance Negative	10% level of significance Positive	10% level of significance Negative	Z-value
Constant	*a*		0.0019	68.8	12.5	0.0	25.0	0.0	2.78 ***
R^{TSE}_{mt}	*b*		0.9390	93.8	68.8	0.0	68.8	0.0	6.44 ***
R^{US}_{mt}	*c*		0.7279	87.5	37.5	0.0	43.8	0.0	4.05 ***
$R^{TSE}_{mt}{*}DI$	*d*		0.2689	68.8	6.3	6.3	37.5	12.5	1.01
$R^{US}_{mt}{*}DI$	*e*		-0.1238	43.8	0.0	0.0	0.0	6.3	-0.56
DCAR	$24\gamma_1$	[AD-25, AD-2]	0.0484	56.3	6.3	0.0	12.5	0.0	1.22
DAD	$3\gamma_2$	[AD-1, AD+1]	-0.0250	31.3	6.3	31.3	6.3	37.5	-2.11 **
DINT	$T\gamma_3$	[AD+2,ID-2]	-0.0113	56.3	18.8	12.5	31.3	18.8	-0.26
DID	$3\gamma_4$	[ID-1, ID+1]	0.0365	68.8	50.0	18.8	56.3	18.8	1.84 *
DPOST	$24\gamma_5$	[ID+2, ID+25]	-0.1029	31.3	6.3	12.5	6.3	18.8	-1.98 **

Table 3-6 (Continued)

Panel B: Daily average abnormal returns before and after the announcement (issue) dates and CAAR for the other window periods.

Announcement Date (a)					Issue Date (b)			
Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value		Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value
-25, -11	0.0118	56.3	0.49		-25, -11	-0.0151	37.5	-0.58
-10, -2	0.0452	50.0	1.22		-10, -2	0.0127	50.0	0.29
-10	0.0038	56.3	0.43		-10	0.0009	43.8	0.12
-9	-0.0042	43.8	-0.45		-9	-0.0054	56.3	-0.38
-8	0.0082	62.5	1.17		-8	-0.0038	50.0	-0.55
-7	0.0058	62.5	0.95		-7	0.0001	50.0	0.01
-6	0.0015	37.5	0.14		-6	-0.0241	31.3	-1.45
-5	0.0024	37.5	0.37		-5	-0.0009	50.0	-0.08
-4	0.0015	50.0	0.19		-4	0.0046	43.8	0.79
-3	0.0114	56.3	1.40		-3	0.0149	50.0	1.46
-2	0.0112	37.5	0.62		-2	0.0202	50.0	1.09
-1	-0.0126	25.0	-1.47		-1	0.0179	56.3	1.55
0	-0.0037	37.5	-0.27		0	-0.0009	56.3	-0.11
+1	-0.0097	18.8	-1.07		+1	0.0124	43.8	1.10
+2	0.0091	50.0	1.09		+2	0.0080	62.5	1.15
+3	0.0044	43.8	0.44		+3	-0.0109	31.3	-1.57
+4	-0.0028	50.0	-0.25		+4	-0.0091	31.3	-1.17
+5	0.0047	62.5	0.52		+5	-0.0043	43.8	-0.62
+6	-0.0071	50.0	-0.88		+6	-0.0015	37.5	-0.13
+7	-0.0056	25.0	-0.98		+7	0.0015	50.0	0.16
+8	-0.0028	56.3	-0.40		+8	0.0056	56.3	0.61
+9	0.0061	56.3	1.04		+9	-0.0087	18.8	-1.48
+10	0.0011	43.8	0.12		+10	0.0037	50.0	0.45
+2, +10	0.0174	50.0	0.79		+2, +10	-0.0172	37.5	-0.79
+11, +25	0.0025	50.0	0.09		+11, +25	-0.0965	25.0	-2.08 **

(a) Day 0 is the day of the announcement of the global seasoned offering.
(b) Day 0 is the issue day of the global seasoned offering.

Table 3-7

This table reports the cumulative average abnormal returns (CAAR) for different event window periods around the announcement and issue dates of *International* seasoned Canadian cross-listed shares on the *NYSE/AMEX*. The regression used is based on the following IAPM:

$$R_{it} = a_i + b_i R^{TSE}_{mt} + c_i R^{US}_{mt} + d_i R^{TSE}_{mt}{*}DI + e_i R^{US}_{mt}{*}DI + \gamma_{1i} DCAR_t + \gamma_{2i} DAD_t + \gamma_{3i} DINT_t + \gamma_{4i} DID_t + \gamma_{5i} DPOST_t + \varepsilon_{it}$$

R_{it} is the rate of return in excess of the Canadian daily risk-free rate (one month Canada T-bill rate) for firm *i*. R^{TSE}_{mt} is the TSE300 market return premium and is equal to the daily TSE300 market return minus the Canadian daily risk-free rate. R^{US}_{mt} is the CRSP market return premium and is equal to the difference between the CRSP market return and the U.S. daily risk-free rate (one month U.S. T-bill rate). The R^{US}_{mt} is orthogonalized to the R^{TSE}_{mt}. The dummy variable *DI* is the dummy beta shift that takes the value of one over the period one day after the announcement day (AD) and ending 25 days after the issue date, that is [AD-1, ID+25], and is zero otherwise. The dummy variable $DCAR_t$ corresponds to the pre-announcement window period, and takes the value of one over the period starting 25 days before the announcement day and ending two days before the announcement date, [AD-25, AD-2], and is zero otherwise. DAD_t is a dummy variable that equals one on the three-day announcement date, [AD-1, AD+1], and is zero otherwise. $DINT_t$ is equal to one in the interim period starting two days after the announcement date and ending two days before the issue date, [AD+2, ID-2], and is zero otherwise. DID_t is a dummy variable that equals one on the three-day issue date, [ID-1, ID+1], and is zero otherwise. $DPOST_t$ takes the value of one from the period starting two days after the issue date and ending 25 days after the issue date, [ID+2, ID+25], and is zero otherwise. The parameters $\gamma_{1i}, \ldots, \gamma_{5i}$ are the abnormal returns generated for each trading day through the event window periods for firm *i*. For example, $3\gamma_{2i}$ is the cumulative abnormal return for the 3-day announcement date for firm *i* and is equal to a CAAR of -0.0167. When the dummy variable takes on a value of one over T days, the T-day cumulative abnormal return is $T\gamma_{3i}$. For the interim period, *DINT*, T differs across firms, and the average estimate of $T\gamma_{3i}$ is computed by multiplying each individual γ_3 by the T days in firm's *i* interim period. The average time period T is 13.3days. The estimation window period in the sample starts from 200 trading days prior to the announcement day, and ends 75 trading days after the issue day. Panel A reports the CAAR for the five window periods. Panel B reports the average abnormal returns for each of the 10 days before and after the announcement (issue) date and the CAAR for other window periods. The statistical significance of the coefficients is given by their Z-value. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively. N indicates the number of SEOs.

Panel A: Estimates of TSE (U.S.) market betas, beta shifts, and CAAR before, during, and after the announcement (issue) dates. (N=26)

Variables	Coefficient	Event Period	Avg. Estimate	% Positive	5% level of significance: Positive	5% level of significance: Negative	10% level of significance: Positive	10% level of significance: Negative	Z-value
Constant	*a*		0.0012	76.9	11.5	3.8	30.8	3.8	3.21 ***
R^{TSE}_{mt}	*b*		0.9070	100.0	76.9	0.0	80.8	0.0	7.76 ***
R^{US}_{mt}	*c*		-0.3287	38.5	7.7	19.2	11.5	23.1	-1.90 *
$R^{TSE}_{mt}{*}DI$	*d*		0.1637	65.4	11.5	11.5	11.5	11.5	0.94
$R^{US}_{mt}{*}DI$	*e*		0.2341	65.4	7.7	3.8	11.5	3.8	1.60
DCAR	$24\gamma_1$	[AD-25, AD-2]	0.0033	46.2	0.0	0.0	0.0	0.0	0.20
DAD	$3\gamma_2$	[AD-1, AD+1]	-0.0167	46.2	11.5	34.6	15.4	38.5	-1.84 *
DINT	$T\gamma_3$	[AD+2,ID-2]	-0.0011	38.5	7.7	15.4	11.5	15.4	-0.06
DID	$3\gamma_4$	[ID-1, ID+1]	0.0008	50.0	19.2	19.2	30.8	19.2	0.13
DPOST	$24\gamma_5$	[ID+2, ID+25]	-0.0210	53.8	0.0	7.7	0.0	19.2	-1.08

Table 3-7 (Continued)

Panel B: Daily average abnormal returns before and after the announcement (issue) dates and CAAR for the other window periods.

Announcement Date (a)				Issue Date (b)			
Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value	Window Interval, Day	Average Abnormal Return	Percent Positive	Z-value
-25, -11	-0.0326	26.9	-1.82 *	-25, -11	0.0017	46.2	0.13
-10, -2	0.0338	61.5	2.36 **	-10, -2	0.0241	57.7	1.74 *
-10	0.0057	61.5	1.26	-10	-0.0064	46.2	-1.21
-9	0.0002	38.5	0.04	-9	0.0116	61.5	1.82 *
-8	0.0012	42.3	0.25	-8	0.0023	38.5	0.38
-7	0.0056	50.0	1.47	-7	0.0064	69.2	1.73 *
-6	-0.0030	38.5	-0.78	-6	-0.0027	42.3	-0.96
-5	0.0085	61.5	1.67	-5	0.0041	53.8	0.91
-4	0.0117	61.5	2.15 **	-4	0.0083	65.4	1.39
-3	-0.0018	42.3	-0.44	-3	0.0063	69.2	1.27
-2	0.0077	46.2	1.31	-2	-0.0046	30.8	-1.43
-1	-0.0018	50.0	-0.36	-1	0.0057	65.4	1.76 *
0	-0.0108	26.9	-2.12 **	0	-0.0014	42.3	-0.31
+1	-0.0032	46.2	-0.65	+1	0.0002	42.3	0.08
+2	0.0027	53.8	0.81	+2	-0.0030	57.7	-0.66
+3	-0.0101	42.3	-2.10 **	+3	0.0011	53.8	0.26
+4	-0.0007	46.2	-0.19	+4	0.0024	46.2	0.58
+5	0.0020	50.0	0.54	+5	-0.0006	50.0	-0.16
+6	0.0051	65.4	1.58	+6	0.0014	61.5	0.41
+7	-0.0005	53.8	-0.13	+7	0.0055	61.5	1.49
+8	0.0017	53.8	0.46	+8	-0.0019	42.3	-0.37
+9	-0.0018	46.2	-0.58	+9	-0.0010	46.2	-0.24
+10	0.0057	69.2	1.74	+10	-0.0025	42.3	-0.63
+2, +10	-0.0021	46.2	-0.22	+2, +10	-0.0021	34.6	-0.18
+11, +25	-0.0277	42.3	-1.13	+11, +25	0.0050	57.7	0.19

(a) Day 0 is the day of the announcement of the global seasoned offering.
(b) Day 0 is the issue day of the global seasoned offering.

Table 3-8

This table reports the descriptive statistics for firm-information variables for two sample periods before the announcement of the *Domestic* and *International* seasoned offerings by CCS on the *NYSE/AMEX* and *NASDAQ*.
Panel A reports the means (medians) and the *p*-values for the differences in means (medians) of the firm-information variables for the *Domestic* sample for two time periods. The periods are from −150 days to −76 days before the announcement day, [AD-150, AD-76], (column (1)), and from −75 days to −2 days before the announcement day, [AD-75, AD-2], (column (2)). Panel B reports the results for the *International* sample. The firm-information variables for firm *i* are as follows. *PreCAR* is the average of the differences of the daily cumulative abnormal returns in excess of the TSE market return. *TO* is the average of the annualized daily volume turnover (daily share volume divided by number of outstanding shares). *ABVOL* is the average of the differences between daily actual and expected trading volumes. For each firm, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. *ABESPREAD* is the average of the differences between the daily effective and expected effective bid-ask spreads, where the later is obtained from an ARMA model. *TRADES* is the average of the daily number of trades. Differences in means and medians are tested with a t-test and the Wilcoxon-Mann/Whitney, respectively (column 3). Column (4) reports the proportion of means (medians) that are significantly higher for each variable in sample S2 relative to sample S1. Column (5) reports the proportion of means (medians) that are significantly higher for each variable in sample S1 relative to sample S2. Column (6) displays whether positive, negative or undetermined information may predominate based on the signs >, < and = placed between columns (4) and (5). Finally, column (7) reports the expected abnormal returns at the announcement date (AD) associated to the type of information expected as indicated in column (6). *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. N indicates the number of seasoned equity offerings.

	(1)	(2)	(3)	(4)		(5)	(6)	(7)
	Sample period (S1)	Sample period (S2)	*p*-value	S2>S1		S2<S1	Comparison between (4) and (5)	
	[AD-150, AD-76]	[AD-75, AD-2]		Significant at the 0.05 level			Type of Info. expected to dominate	Expected relation with abnormal returns at AD
	Mean (Median)	Mean (Median)	Difference in Means (Medians)	Percent Significant				
Panel A: *Domestic* sample (N=116)								
PreCAR	0.0297	0.0622	0.0650 *	56.9%	>	31.0%	Undetermined	Undetermined
	(0.0296)	(0.0572)	(0.0654) *	(52.6%)	>	(31.0%)		
TO	0.425	0.441	0.2873	25.9%	>	12.9%	Positive	Positive
	(0.208)	(0.25)	(0.2147)	(32.8%)	>	(19.8%)		
ABVOL	-5446.6	-5876.3	0.4175	6.0%	>	3.4%	Negative	Negative
	(-44383.3)	(-45227.5)	(0.4266)	(5.2%)	>	(7.8%)		
ABESPREAD	-0.0021	0.0124	0.1509	7.8%	>	4.3%	Negative	Negative
	(-0.1179)	(-0.0992)	(0.1603)	(12.1%)	>	(11.2%)		
TRADES	53.0	60.5	0.1509	40.5%	>	19.0%	Negative	Negative
	(43.3)	(50.6)	(0.1603)	(42.2%)	>	(20.7%)		
Panel B: *International* sample (N=42)								
PreCAR	0.0349	0.0940	0.0805 *	58.5%	>	26.8%	Undetermined	Undetermined
	(0.0412)	(0.0929)	(0.0716) *	(58.5%)	>	(26.8%)		
TO	0.358	0.375	0.3311	12.2%	>	17.1%	Positive	Positive
	(0.175)	(0.191)	(0.2708)	(22.0%)	>	(14.6%)		
ABVOL	-1,842.3	2,065.1	0.4608	2.4%	=	2.4%	Undetermined	No effect
	(-35,558.7)	(-30,793.4)	(0.3316)	(12.2%)	=	(12.2%)		
ABESPREAD	0.0070	-0.0346	0.5126	2.4%	=	2.4%	Positive	Positive
	(-0.0764)	(-0.1186)	(0.4797)	(2.4%)	<	(7.3%)		
TRADES	43.1	60.0	0.1157	53.7%	>	9.8%	Negative	Negative
	(36.1)	(50.8)	(0.0962) *	(58.5%)	>	(14.6%)		

Table 3-9

This table reports the descriptive statistics for firm-information variables for two sample periods before the announcement of the *Domestic* seasoned offerings by CCS on the *NASDAQ* and *NYSE/AMEX*, respectively.
Panel A reports the means (medians) and the *p*-values for the differences in means (medians) of the firm-information variables for the *NASDAQ* sample for two time periods. The periods are from −150 days to −76 days before the announcement day, [AD-150, AD-76], (column (1)), and from −75 days to −2 days before the announcement day, [AD-75, AD-2], (column (2)). Panel B reports the results for the *NYSE/AMEX* sample. The firm-information variables for firm *i* are as follows. *PreCAR* is the average of the differences of the daily cumulative abnormal returns in excess of the TSE market return. *TO* is the average of the annualized daily volume turnover (daily share volume divided by number of outstanding shares). *ABVOL* is the average of the differences between daily actual and expected trading volumes. For each firm, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. *ABESPREAD* is the average of the differences between the daily effective and expected effective bid-ask spreads, where the later is obtained from an ARMA model. *TRADES* is the average of the daily number of trades. Differences in means and medians are tested with a t-test and the Wilcoxon-Mann/Whitney, respectively (column 3). Column (4) reports the proportion of means (medians) that are significantly higher for each variable in sample S2 relative to sample S1. Column (5) reports the proportion of means (medians) that are significantly higher for each variable in sample S1 relative to sample S2. Column (6) displays whether positive, negative or undetermined information may predominate based on the signs >, < and = placed between columns (4) and (5). Finally, column (7) reports the expected abnormal returns at the announcement date (AD) associated to the type of information expected as indicated in column (6). *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. N indicates the number of seasoned equity offerings

	(1)	(2)	(3)	(4)		(5)	(6)	(7)
	Sample period (S1)	Sample period (S2)	*p*-value	S2>S1		S2<S1	Comparison between (4) and (5)	
	[AD-150, AD-76]	[AD-75, AD-2]		Significant at the 0.05 level			Type of Info. Expected To dominate	Relation with Abnormal Returns at AD
	Mean (Median)	Mean (Median)	Difference in Means (Medians)	Percent Significant				
Panel A: Canadian cross-listed shares on *NASDAQ* (N=54)								
PreCAR	0.0305	0.0751	0.0476 **	55.6%	>	35.2%	Undetermined	Undetermined
	(0.0318)	(0.0687)	(0.0519) *	(48.1%)	>	(37.0%)		
TO	0.383	0.375	0.2859	24.1%	>	11.1%	Positive	Positive
	(0.166)	(0.183)	(0.1854)	(31.5%)	>	(22.2%)		
ABVOL	-468.3	-5692.3	0.4041	5.6%	>	1.9%	Negative	Negative
	(-25564.1)	(-29317.6)	(0.4280)	(5.6%)	>	(3.7%)		
ABESPREAD	-0.0023	0.0032	0.1336	3.7%	<	9.3%	Positive	Positive
	(-0.1741)	(-0.1552)	(0.1534)	(7.4%)	<	(9.3%)		
TRADES	24.4	27.8	0.1336	42.6%	>	20.4%	Negative	Negative
	(20.5)	(22.1)	(0.1534)	(40.7%)	>	(22.2%)		
Panel B: Canadian cross-listed shares on *NYSE/AMEX* (N=62)								
PreCAR	0.0290	0.0510	0.0803 *	58.1%	>	27.4%	Undetermined	Undetermined
	(0.0276)	(0.0473)	(0.0772) *	(56.5%)	>	(25.8%)		
TO	0.458	0.491	0.2885	27.4%	>	14.5%	Positive	Positive
	(0.241)	(0.308)	(0.2402)	(33.9%)	>	(17.7%)		
ABVOL	-9782.5	-6036.6	0.4292	6.5%	>	4.8%	Negative or Positive	Negative or Positive
	(-60774.2)	(-59084.5)	(0.4255)	(4.8%)	<	(11.3%)		
ABESPREAD	-0.0019	0.0205	0.1660	11.3%	>	0.0%	Negative	Negative
	(-0.0689)	(-0.0505)	(0.1663)	(16.1%)	>	(12.9%)		
TRADES	77.9	89.0	0.1660	38.7%	>	17.7%	Negative	Negative
	(63.3)	(75.5)	(0.1663)	(43.5%)	>	(19.4%)		

Table 3-10

This table reports the descriptive statistics for firm-information variables for two sample periods before the announcement of the *International* seasoned offerings by CCS on the *NASDAQ* and *NYSE/AMEX*, respectively.
Panel A reports the means (medians) and the *p*-values for the differences in means (medians) of the firm-information variables for the *NASDAQ* sample for two time periods. The periods are from −150 days to −76 days before the announcement day, [AD-150, AD-76], (column (1)), and from −75 days to −2 days before the announcement day, [AD-75, AD-2], (column (2)). Panel B reports the results for the *NYSE/AMEX* sample. The firm-information variables for firm *i* are as follows. *PreCAR* is the average of the differences of the daily cumulative abnormal returns in excess of the TSE market return. *TO* is the average of the annualized daily volume turnover (daily share volume divided by number of outstanding shares). *ABVOL* is the average of the differences between daily actual and expected trading volumes. For each firm, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. *ABESPREAD* is the average of the differences between the daily effective and expected effective bid-ask spreads, where the later is obtained from an ARMA model. *TRADES* is the average of the daily number of trades. Differences in means and medians are tested with a t-test and the Wilcoxon-Mann/Whitney, respectively (column 3). Column (4) reports the proportion of means (medians) that are significantly higher for each variable in sample S2 relative to sample S1. Column (5) reports the proportion of means (medians) that are significantly higher for each variable in sample S1 relative to sample S2. Column (6) displays whether positive, negative or undetermined information may predominate based on the signs >, < and = placed between columns (4) and (5). Finally, column (7) reports the expected abnormal returns at the announcement date (AD) associated to the type of information expected as indicated in column (6). *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. N indicates the number of seasoned equity offerings

	(1)	(2)	(3)	(4)		(5)	(6)	(7)
	Sample period (S1)	Sample period (S2)	*p*-value	S2>S1		S2<S1	Comparison between (4) and (5)	
	[AD-150, AD-76]	[AD-75, AD-2]		Significant at the 0.05 level			Type of Info. Expected To dominate	Relation with Abnormal Returns at AD
	Mean (Median)	Mean (Median)	Difference in Means (Medians)	Percent Significant				
Panel A: Canadian cross-listed shares on *NASDAQ* (N=16)								
PreCAR	0.0433	0.1032	0.0805 *	56.3%	>	25.0%	Undetermined	Undetermined
	(0.0549)	(0.0937)	(0.0839) *	(56.3%)	>	(31.3%)		
TO	0.416	0.35	0.3197	6.3%	<	25.0%	Negative	Negative
	(0.175)	(0.175)	(0.2457)	(18.8%)	=	(18.8%)		
ABVOL	223.5	-3,363.8	0.4799	0.0%	<	6.3%	Positive	Positive
	(-14,434.0)	(-14,952.5)	(0.2681)	(18.8%)	=	(18.8%)		
ABESPREAD	0.0322	-0.0402	0.4644	6.3%	=	6.3%	Positive	Positive
	(-0.1191)	(-0.1736)	(0.4380)	(0.0%)	<	(12.5%)		
TRADES	22.8	29.3	0.1706	31.3%	>	18.8%	Negative	Negative
	(16.2)	(21.5)	(0.0766) *	(50.0%)	>	(31.3%)		
Panel B: Canadian cross-listed shares on *NYSE/AMEX* (N=26)								
PreCAR	0.0272	0.0958	0.0775 *	61.5%	>	26.9%	Undetermined	Undetermined
	(0.0300)	(0.1003)	(0.0612) *	(61.5%)	>	(23.1%)		
TO	0.316	0.391	0.3572	15.4%	>	11.5%	Positive	Positive
	0.166	(0.191)	(0.3126)	(23.1%)	>	(11.5%)		
ABVOL	-3,113.0	5,259.6	0.4695	3.8%	>	0.0%	Negative	Negative
	(-47,891.6)	(-39,938.9)	(0.3626)	(7.7%)	=	(7.7%)		
ABESPREAD	-0.0076	-0.0289	0.5598	0.0%	=	0.0%	Undetermined	No effect
	(-0.0499)	(-0.0801)	(0.5193)	(3.8%)	=	(3.8%)		
TRADES	54.5	77.8	0.0775 *	69.2%	>	3.8%	Negative	Negative
	(47.4)	(67.7)	(0.1047)	(65.4%)	>	(3.8%)		

Table 3-11

This table reports the numbers of offerings with associated press articles around the announcement [AD-10, AD+5] and issue [AD+6, ID+5] dates for Canadian firms that have cross-listed shares on the *NASDAQ* and *NYSE/AMEX* and that floated Domestic and International SEOs during the period of time 1993-1998. No News refers to articles that are not expected to have any significant price impact at the announcement and issue dates. Good News (Bad News) correspond to articles that are expected to have a significant positive (negative) effect (abnormal returns) at the announcement and/or issue dates, respectively. Panel A reports the total number of articles and the percent of No News, Good News and Bad news, for the total sample of Canadian firms with cross-listed shares on the *NASDAQ* and *NYSE/AMEX*. Panels B and C report similar values for the samples of Canadian firms with cross-listed shares on the *NASDAQ* and *NYSE/AMEX*, respectively.

Panel A: Canadian firms with cross-listed shares on the *NASDAQ* and *NYSE/AMEX*				
	Domestic Sample		International Sample	
	[AD-10, AD+5]	[AD+6, ID+5]	[AD-10, AD+5]	[AD+6, ID+5]
Total articles	176	110	84	93
No News	46.0%	46.4%	44.1%	43.0%
Good News	39.8%	39.1%	44.0%	49.5%
Bad News	14.2%	14.5%	11.9%	7.5%
Panel B: Canadian firms with cross-listed shares on the *NASDAQ*				
Total articles	60	43	24	33
No News	46.7%	48.9%	33.4%	39.2%
Good News	40.0%	44.2%	45.8%	45.5%
Bad News	13.3%	4.7%	20.8%	15.2%
Panel C: Canadian cross-listed shares on the *NYSE/AMEX*				
Total Articles	116	67	60	60
No News	45.6%	43.3%	48.4%	45.0%
Good News	39.7%	35.8%	43.3%	51.7%
Bad News	14.7%	20.9%	8.3%	3.3%

Table 3-12

This table reports the cross-sectional regression results for the overall sample of *Domestic* and *International* seasoned CCS at the *announcement* date. The sample corresponds to the CCS on the *NASDAQ* and *NYSE/AMEX*. The abnormal returns are regressed on the size of the offering at the announcement date, private (firm-specific) and public information variables as follows:

$$ADAR_i = a_0 + (a_1 + \delta_{OFFSIZE}INT)OFFSIZE_i + (a_2 + \delta_{CHCAR}INT)CHCAR_i + (a_3 + \delta_{CHTO}INT)CHTO_i + (a_4 + \delta_{CHABVOL}INT)CHABVOL_i + (a_5 + \delta_{CHABESPREAD}INT)CHABESPREAD_i$$
$$+ (a_6 + \delta_{CHTRADES}INT)CHTRADES_i + (a_7 + \delta_{ADB}INT)ADB_i + (a_8 + \delta_{ADG}INT)ADG_i + (a_9 + \delta_{DNS}INT)DNS_i + \varepsilon_i$$

$ADAR_i$ is the cumulative abnormal return for the three-day announcement date, [AD-1, AD+1], for firm *i*. $OFFSIZE_i$ is the size of the seasoned offering divided by the total number of shares outstanding before the announcement date. Panel A reports the regression results when the information variables are equal to the change in the average value between the pre-announcement sample periods [AD-150, AD-2] and [AD-75, AD-2] for firm *i*. $CHCAR_i$ is the change in cumulative prior abnormal return. *CHTO* is the change in the volume turnover. *INT* is a dummy variable that takes the value of one for the announcements of international SEOs, and is zero for domestic SEOs. *CHABVOL* is the change in the average of the differences of the daily actual and expected trading volumes. For each announcement, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. $CHABESPREAD_i$ is the abnormal effective half-spread and is equal to the difference between the daily actual and expected effective bid-ask half-spreads where the expectation is obtained using an ARMA model. $CHTRADES_i$ is the change in the number of trades. ADB_i (ADG_i) is a dummy variable that equals one for press articles deemed unfavorable (favorable) for firm i around the announcement date [AD-10, AD+5], and is zero otherwise. DNS_i is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering. The error term ε_i is assumed to be i.i.d. ~ N (0, σ^2). Panel B reports the regression results using as information variables their average values during the period [AD-75, AD-2]. The variables are denoted as *PreCAR*, *TO*, *ABVOL*, *ABESPREAD*, and *TRADES*. The cells report the mean coefficients and the p-values below. Tests for significance use Newey and West (1987) robust t-statistics. Columns (1) to (6) report the results by using different combinations of variables to assess whether some of them subsume others. The adjusted R squares and the probability (F-statistic) values are reported in the last row of each column. *, **, and *** indicate significance at the10, 5 and 1 percent levels, respectively.

Panel A

	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	-0.0438	(0)	-0.0403	(0.0001)***	-0.0425	(0)	-0.0398	(0.0001)***	-0.0460	(0.0001)***	-0.0412	(0.0002)***
OFFSIZE	0.0414	(0.0887)*	0.0507	(0.0600)*	0.0466	(0.0372)**	0.0530	(0.0236)**	0.0409	(0.0930)*	0.0516	(0.0558)*
*OFFSIZE*INT*			-0.0731	(0.0574)*			-0.0679	(0.1004)			-0.0712	(0.0407)**
CHCAR	0.0500	(0.0830)*	0.0676	(0.0140)**	0.0284	(0.3295)	0.0453	(0.1221)	0.0294	(0.2984)	0.0400	(0.1632)
*CHCAR*INT*			-0.1034	(0.0680)*			-0.0935	(0.1114)			-0.0906	(0.0952)*
CHTO					0.0672	(0.0236)**	0.072	(0.0440)**				
*CHTO*INT*							-0.0336	(0.5281)				
CHABVOL					-4E-07	(0.0025)***	-4E-07	(0.0089)***				
*CHABVOL*INT*							7E-08	(0.8369)				
CHABESPREAD									-0.0976	(0.0972)	-0.1236	(0.0650)*
*CHABESPREAD*INT*											0.1315	(0.1269)
CHTRADES									0.0000	(0.9478)	0.0000	(0.8240)
*CHTRADES*INT*											0.0003	(0.2529)
ADB	-0.0076	(0.5385)	0.0035	(0.7996)	-0.0092	(0.4726)	0.0018	(0.9019)	-0.0052	(0.6719)	0.0070	(0.6111)
*ADB*INT*			-0.0412	(0.0117)**			-0.0401	(0.0252)**			-0.0439	(0.0086)***
ADG	0.0131	(0.1506)	0.0170	(0.1261)	0.0160	(0.0425)*	0.0182	(0.0646)*	0.0110	(0.2187)	0.0127	(0.2441)
*ADG*INT*			-0.0022	(0.8993)			0.0001	(0.9942)			0.0017	(0.9199)
DNS	0.0227	(0.0186)**	0.0164	(0.1180)	0.0184	(0.0197)**	0.0142	(0.0949)*	0.0273	(0.0098)***	0.0223	(0.0524)*
*DNS*INT*			0.0148	(0.1911)			0.0142	(0.2494)			0.0045	(0.7455)
R^2 Adj.	0.058		0.089		0.110		0.128		0.099		0.143	
F (Prob)	0.014		0.007		0.0009		0.001		0.001		0.0008	

Table 3-12 (Continued)

Panel B												
	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	Coeff	p-value	Coeff	p-value	Coeff
CONSTANT	-0.0471	(0)***	-0.0413	(0.0001)***	-0.0626	(0)***	-0.0562	(0)***	0.0457	(0.0001)***	-0.0369	(0.0012)***
OFFSIZE	0.0395	(0.1064)	-0.0258	(0.4377)	0.0434	(0.0683)*	0.0516	(0.0685)*	0.0388	(0.1701)	-0.0305	(0.3354)
*OFFSIZE*INT*			0.0719	(0.0720)*			-0.0942	(0.0182)**			0.0726	(0.0572)*
PreCAR	0.0548	(0.1778)	0.0623	(0.1559)	0.0397	(0.3496)	0.0504	(0.2807)	0.0513	(0.1955)	0.0308	(0.4609)
*PreCAR*INT*			-0.0226	(0.6855)			-0.0430	(0.5051)			0.0283	(0.6333)
TO					0.0408	(0.0515)*	0.0336	(0.1693)				
*TO*INT*							0.0408	(0.1484)				
ABVOL					-8E-08	(0.3833)	-4E-07	(0.6036)				
*ABVOL*INT*							4E-07	(0.1434)				
ABESPREAD									-0.0354	(0.2417)	-0.0416	(0.2305)
*ABESPREAD*INT*											0.0582	(0.5262)
TRADES									-3E-05	(0.6241)	-0.0001	(0.3429)
*TRADES*INT*											0.0001	(0.4349)
ADB	-0.0045	(0.7329)	0.0071	(0.6472)	-0.0014	(0.9166)	0.0093	(0.5616)	-0.0032	(0.8136)	0.0108	(0.5288)
*ADB*INT*			-0.0490	(0.0080)***			-0.0513	(0.0128)**			-0.0538	(0.0106)**
ADG	0.0153	(0.1058)	0.0197	(0.0940)*	0.0180	(0.0379)**	0.0221	(0.0488)**	0.0150	(0.1179)	0.0195	(0.1127)
*ADG*INT*			-0.0046	(0.7958)			-0.0048	(0.7860)			-0.0073	(0.6843)
DNS	0.0231	(0.0164)**	0.0147	(0.1804)	0.0187	(0.0214)**	0.0125	(0.1884)	0.0240	(0.0218)**	0.0154	(0.2168)
*DNS*INT*	-0.0471	(0)***	0.0111	(0.3859)	-0.0626	(0)***	0.0047	(0.7276)	0.0457	(0.0001)***	0.0062	(0.7130)
R^2 Adj.	0.043		0.052		0.067		0.066		0.040		0.044	
F (Prob)	0.037		0.054		0.013		0.043		0.065		0.108	

Table 3-13

This table reports the cross-sectional regression results for the overall sample of *Domestic* and *International* seasoned CCS at the *issue* date. The sample corresponds to the CCS on the *NASDAQ and NYSE/AMEX*. The abnormal returns are regressed on the size of the offering at the announcement date, private (firm-specific) and public information variables as follows:

$$IDAR_i = a_0 + (a_1 + \delta_{OFFSIZE}INT)OFFSIZE_i + (a_2 + \delta_{ADAR}INT)ADAR_i + (a_3 + \delta_{ADAR}INT)DINT_i + (a_4 + \delta_{CHCAR}INT)CHCAR_i + (a_5 + \delta_{CHTO}INT)CHTO_i + (a_6 + \delta_{CHABVOL}INT)CHABVOL_i + (a_7 + \delta_{CHABESPREAD}INT)CHABESPREAD_i + (a_8 + \delta_{CHTRADES}INT)CHTRADES_i + (a_9 + \delta_{ADB}INT)IDB_i + (a_{10} + \delta_{ADG}INT)IDG_i + (a_{11} + \delta_{DNS}INT)DNS_i + \varepsilon_i$$

$IDAR_i$ is the cumulative abnormal return for the three-day actual or expected issue date, [ID-1, ID+1], for firm *i*. $ADAR_i$ is the cumulative abnormal return for the three-day announcement date, [AD-1, AD+1], for firm *i*. $DINT_i$ is the cumulative abnormal return for the period two days after the announcement date to two days before the actual or issue date, [ID+2, ID-2]. $OFFSIZE_i$ is the size of the seasoned offering divided by the total number of shares outstanding before the announcement date. Panel A reports the regression results when the information variables are equal to the change in the average value between the pre-announcement sample periods [AD-150, AD-2] and [AD-75, AD-2] for firm *i*. $CHCAR_i$ is the change in cumulative prior abnormal returns. *CHTO* is the change in the volume turnover. *INT* is a dummy variable that takes the value of one for the announcements of international SEOs, and is zero for domestic SEOs. *CHABVOL* is the change in the average of the differences of the daily actual and expected trading volumes. For each announcement, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. $CHABESPREAD_i$ is the abnormal effective half-spread and is equal to the difference between the daily actual and expected effective bid-ask half-spreads where the expectation is obtained using an ARMA model. $CHTRADES_i$ is the change in the number of trades. IDB_i (IDG_i) is a dummy variable that equals one for press articles deemed unfavorable (favorable) for firm i around the issue date [AD+6, ID+5], and is zero otherwise. DNS_i is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering. The error term ε_i is assumed to be i.i.d. ~ N (0, σ^2). Panel B reports the regression results using as information variables their average values during the period [AD-75, AD-2]. The variables are denoted as *PreCAR*, *TO*, *ABVOL*, *ABESPREAD*, and *TRADES*. The cells report the mean coefficients and the p-values below. Tests for significance use Newey and West (1987) robust t-statistics. Columns (1) to (6) report the results by using different combinations of variables to assess whether some of them subsume others. The adjusted R squares and the probability (F-statistic) values are reported in the last row of each column. *, **, and *** indicate significance at the10, 5 and 1 percent levels, respectively.

Panel A

	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	0.0069	(0.5393)	0.0061	(0.5138)	0.0076	(0.5240)	0.0058	(0.5598)	0.0049	(0.6579)	0.0040	(0.6738)
OFFSIZE	-0.0017	(0.9393)	-0.0119	(0.6452)	0.0015	(0.9488)	-0.0090	(0.7447)	-0.0009	(0.9669)	-0.0092	(0.7238)
*OFFSIZE*INT*			0.0151	(0.7331)			0.0136	(0.7845)			0.0085	(0.8411)
CHCAR	-0.0703	(0.0312)**	-0.0811	(0.0218)**	-0.0791	(0.0281)**	-0.0909	(0.0193)**	-0.0835	(0.0289)	-0.0910	(0.0342)**
*CHCAR*INT*			0.0365	(0.6279)			0.0469	(0.5712)			0.0241	(0.7705)
ADAR	-0.0059	(0.9665)	0.0297	(0.8565)	-0.0315	(0.8200)	-0.0122	(0.9383)	-0.0378	(0.7756)	-0.0082	(0.9598)
*ADAR*INT*			-0.2085	(0.3119)			-0.1720	(0.3854)			-0.2114	(0.2988)
DINT	0.0224	(0.7178)	0.0447	(0.5402)	0.0172	(0.7759)	-0.0426	(0.5660)	0.0161	(0.7784)	-0.0552	(0.4349)
*DINT*INT*			-0.0858	(0.4258)			0.0867	(0.4009)			0.0950	(0.3365)
CHTO					0.0300	(0.3123)	0.0396	(0.2838)				
*CHTO*INT*							-0.0300	(0.5380)				
CHABVOL					-1.E-07	(0.3808)	-2E-07	(0.3424)				
*CHABVOL*INT*							-4E-08	(0.9151)				
CHABESPREAD									-0.0598	(0.1856)	-0.0535	(0.3471)
*CHABESPREAD*INT*											0.0533	(0.5424)
CHTRADES									4E-05	(0.8157)	-4E-06	(0.9823)
*CHTRADES*INT*											0.0004	(0.1740)
IDB	0.0146	(0.4362)	-0.0144	(0.2109)	0.0139	(0.4645)	-0.0152	(0.2062)	0.0103	(0.5799)	-0.0172	(0.2234)
*IDB*INT*			0.0605	(0.0394)			0.0622	(0.0213)**			0.0619	(0.0421)**
IDG	0.0009	(0.9265)	-0.0036	(0.7239)	-0.0001	(0.9939)	-0.0060	(0.5330)	-0.0008	(0.9358)	-0.0038	(0.6896)
*IDG*INT*			0.0065	(0.7740)			0.0093	(0.6864)			0.0092	(0.6756)
DNS	0.0004	(0.9652)	0.0037	(0.6807)	-0.0013	(0.9049)	0.0031	(0.7430)	0.0037	(0.7470)	0.0069	(0.5260)
*DNS*INT*			-0.0035	(0.7205)			-0.0025	(0.8198)			-0.0126	(0.3053)
R^2 Adj.	0.052		0.058		0.051		0.050		0.059		0.053	
F (Prob)	0.033		0.062		0.050		0.113		0.033		0.101	

Table 3-13 (Continued)

Panel B												
	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	Coeff	p-value	Coeff	p-value	Coeff
CONSTANT	0.0100	(0.3639)	0.0078	(0.3922)	0.0009	(0.9361)	-0.0018	(0.8496)	0.0059	(0.5817)	-0.0006	(0.9406)
OFFSIZE	0.0018	(0.9343)	-0.0036	(0.8894)	0.0051	(0.8244)	-0.0013	(0.9623)	0.0064	(0.7840)	0.0051	(0.8524)
*OFFSIZE*INT*			0.0033	(0.9363)			0.0093	(0.7947)			0.0083	(0.8359)
PreCAR	-0.0798	(0.0717)*	-0.1153	0.0041***	-0.0919	(0.0457)	-0.1309	(0.0018)***	-0.0807	(0.0750)*	-0.1221	(0.0027)***
*PreCAR*INT*			0.1909	(0.0113)**			0.2076	(0.0226)**			0.2081	(0.0126)**
ADAR	-0.0227	(0.8789)	0.0087	(0.9601)	-0.0489	(0.7338)	-0.0087	(0.9584)	-0.0164	(0.9134)	0.0301	(0.8621)
*ADAR*INT*			-0.1435	(0.5435)			-0.1502	(0.5118)			-0.1924	(0.4138)
DINT	0.0078	(0.9044)	0.0264	(0.7258)	0.0036	(0.9545)	0.0131	(0.8577)	0.0059	(0.9288)	0.0210	(0.7773)
*DINT*INT*			-0.0445	(0.6676)			-0.0292	(0.7832)			-0.0394	(0.7044)
TO					0.0312	(0.1247)	0.0360	(0.0489)**				
*TO*INT*							-0.0228	(0.6804)				
ABVOL					8.4E-08	(0.5074)	-2E-08	(0.4235)				
*ABVOL*INT*							1.2E-07	(0.6072)				
ABESPREAD									0.0075	(0.7866)	0.0028	(0.9287)
*ABESPREAD*INT*											0.0977	(0.4893)
TRADES									0.0001	(0.1964)	0.0001	(0.0062)***
*TRADES*INT*											-0.0002	(0.2885)
IDB	0.0217	(0.2839)	-0.0129	(0.2659)	0.0151	(0.4575)	-0.0210	(0.1669)	0.0185	(0.4071)	-0.0313	(0.0764)*
*IDB*INT*			0.0564	(0.0536)*			0.0627	(0.0476)**			0.0812	(0.0204)**
IDG	-0.0030	(0.7813)	-0.0086	(0.4439)	-0.0032	(0.7618)	-0.0103	(0.3611)	-0.0029	(0.7981)	-0.0116	(0.3116)
*IDG*INT*			0.0094	(0.6577)			0.0120	(0.5908)			0.0138	(0.5337)
DNS	-5E-05	(0.9967)	0.0059	(0.5756)			0.0009	(0.9264)	0.0002	(0.9863)	0.0072	(0.4908)
*DNS*INT*			-0.0167	(0.1422)	-0.0040	(0.7146)	-0.0096	(0.6564)			-0.0090	(0.6642)
R^2 Adj.	0.033		0.083		0.049		0.095		0.025		0.086	
F (Prob)	0.097		0.020		0.054		0.018		0.171		0.028	

Table 3-14

This table reports the cross-sectional regression results for the sample of *Domestic* seasoned CCS on the *NASDAQ* and *the NYSE/AMEX* at the *announcement* date. The abnormal returns are regressed on the size of the offering at the announcement date, private (firm-specific) and public information variables as follows:

$$ADAR_i = a_0 + (a_1 + \delta_{OFFSIZE}XY)OFFSIZE_i + (a_2 + \delta_{CHCAR}XY)CHCAR_i + (a_3 + \delta_{CHTO}XY)CHTO_i + (a_4 + \delta_{CHABVOL}XY)CHABVOL_i + (a_5 + \delta_{CHABESPREAD}XY)CHABESPREAD_i + (a_6 + \delta_{CHTRADES}XY)CHTRADES_i + (a_7 + \delta_{ADB}XY)ADB_i + (a_8 + \delta_{ADG}XY)ADG_i + (a_9 + \delta_{DNS}XY)DNS_i + \varepsilon_i$$

ADAR$_i$ is the cumulative abnormal return for the three-day announcement date, [AD-1, AD+1], for firm *i*. *OFFSIZE*$_i$ is the size of the seasoned offering divided by the total number of shares outstanding before the announcement date. Panel A reports the regression results when the information variables are equal to the change in the average value between the pre-announcement sample periods [AD-150, AD-2] and [AD-75, AD-2] for firm *i*. *CHCAR*$_i$ is the change in cumulative prior abnormal returns. *CHTO* is the change in the volume turnover. *XY* is a dummy variable that takes the value of one for the announcements of domestic SEOs in the *NYSE/AMEX*, and is zero for domestic SEOs in the *NASDAQ*. *CHABVOL* is the change in the average of the differences of the daily actual and expected trading volumes. For each announcement, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. *CHABESPREAD*$_i$ is the abnormal effective half-spread and is equal to the difference between the daily actual and expected effective bid-ask half-spreads where the expectation is obtained using an ARMA model. *CHTRADES*$_i$ is the change in the number of trades. *ADB*$_i$ (*ADG*$_i$) is a dummy variable that equals one for press articles deemed unfavorable (favorable) for firm i around the announcement date [AD-10, AD+5], and is zero otherwise. *DNS*$_i$ is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering. The error term ε_i is assumed to be i.i.d. ~ N (0, σ^2). Panel B reports the regression results using as information variables their average values during the period [AD-75, AD-2]. The variables are denoted as *PreCAR, TO, ABVOL, ABESPREAD*, and *TRADES*. The cells report the mean coefficients and the p-values below. Tests for significance use Newey and West (1987) robust t-statistics. Columns (1) to (6) report the results by using different combinations of variables to assess whether some of them subsume others. The adjusted R squares and the probability (F-statistic) values are reported in the last row of each column. *, **, and *** indicate significance at the10, 5 and 1 percent levels, respectively.

Panel A

	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	-0.0471	(0.0000)***	-0.0493	(0.0000)***	-0.0460	(0.0000)***	-0.0470	(0.0000)***	-0.0484	(0.0000)***	-0.0431	(0.0000)***
OFFSIZE	0.0562	(0.0346)**	0.0228	(0.2538)	0.0580	(0.0127)***	0.0231	(0.2589)	0.0574	(0.0297)**	0.0181	(0.4087)
*OFFSIZE*XY*			0.0749	(0.2650)			0.0607	(0.2499)			0.0699	(0.0611)*
CHCAR	0.0693	(0.0141)**	0.0934	(0.0040)***	0.0471	(0.1122)	0.0824	(0.0058)***	0.0415	(0.1609)	0.0945	(0.0029)***
*CHCAR*XY*			-0.0673	(0.0821)*			-0.0868	(0.0306)**			-0.1186	(0.0072)***
CHTO					0.0708	(0.0421)**	0.0288	(0.3987)				
*CHTO*XY*							0.0756	(0.2395)				
CHABVOL					-4E-7	(0.0122)**	-8E-08	(0.8369)				
*CHABVOL*XY*							-4E-07	(0.3730)				
CHABESPREAD									-0.1242	(0.0579)*	-0.0471	(0.2528)
*CHABESPREAD*XY*											-0.2493	(0.0833)*
CHTRADES									-2E-05	(0.8704)	-0.0007	(0.3070)
*CHTRADES*XY*											0.0007	(0.2619)
ADB	0.0044	(0.7261)	0.0252	(0.1773)	0.0025	(0.8456)	0.0266	(0.2362)	0.0079	(0.5256)	0.0196	(0.2715)
*ADB*XY*			-0.0382	(0.1193)			-0.0453	(0.0866)*			-0.0261	(0.2341)
ADG	0.0181	(0.1201)	0.0400	(0.0174)**	0.0192	(0.0638)*	0.0399	(0.0178)**	0.0139	(0.2451)	0.0324	(0.0933)*
*ADG*XY*			-0.0360	(0.1093)			-0.0300	(0.1206)			-0.0193	(0.3523)
DNS	0.0215	(0.0553)*	0.0219	(0.1347)	0.0189	(0.0614)*	0.0200	(0.1838)	0.0277	(0.0263)**	0.0239	(0.0693)*
*DNS*XY*			0.0038	(0.8266)			0.0020	(0.9179)			-0.0023	(0.8779)
R^2 Adj.	0.099		0.125		0.152		0.173		0.170		0.240	
F (Prob)	0.005		0.006		0.000		0.002		0.0003		0.0001	

Table 3-14 (Continued)

Panel B												
	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	-0.0476	(0.0000)***	-0.0455	(0.0000)***	-0.0631	(0.0000)***	-0.0658	(0)***	-0.0432	(0.0001)***	-0.0458	(0.0002)***
OFFSIZE	0.0509	(0.0596)*	0.0090	(0.6826)	0.0559	(0.0455)**	0.0084	(0.7068)	0.0474	(0.1427)	0.0049	(0.8415)
*OFFSIZE*XY*			0.0855	(0.2060)			0.0948	(0.1308)			0.0889	(0.1837)
PreCAR	0.0655	(0.1226)	0.1035	(0.0128)**	0.0516	(0.2419)	0.0826	(0.0406)**	0.0613	(0.1275)	0.1035	(0.0060)***
*PreCAR*XY*			-0.1313	(0.0198)**			-0.1428	(0.0152)**			-0.1397	(0.0082)***
TO					0.0372	(0.1382)	0.0744	0.0125**				
*TO*XY*							-0.0324	(0.3887)				
ABVOL					-7E-08	(0.5244)	-2E-07	(0.3897)				
*ABVOL*XY*							1 E-07	(0.6546)				
ABESPREAD									-0.0426	(0.2465)	-0.0252	(0.4468)
*ABESPREAD*XY*											-0.0097	(0.9391)
TRADES									-0.0001	(0.4139)	-0.0003	(0.3106)
*TRADES*XY*											0.0003	(0.2526)
ADB	0.0082	(0.5592)	0.0311	(0.1344)	0.0104	(0.4842)	0.0450	(0.0143)**	0.0111	(0.4651)	0.0285	(0.1942)
*ADB*XY*			-0.0494	(0.0819)*			-0.0662	(0.0172)**			-0.0499	(0.0925)*
ADG	0.0208	(0.0824)*	0.0449	(0.0086)***	0.0234	(0.0415)**	0.0473	(0.0072)***	0.0203	(0.1187)	0.0449	(0.0079)***
*ADG*XY*			-0.0413	(0.0698)*			-0.0378	(0.0915)***			-0.0426	(0.0691)*
DNS	0.0193	(0.0997)	0.0140	(0.3403)	0.0158	(0.1577)	0.0027	(0.8473)	0.0195	(0.1176)	0.0257	(0.1482)
*DNS*XY*	-0.0476	(0.0000)***	0.0115	(0.5319)			0.0185	(0.2528)			-0.0005	(0.9823)
R^2 Adj.	0.056		0.103		0.069		0.130		0.058		0.085	
F (Prob)	0.043		0.016		0.037		0.011		0.058		0.054	

Table 3-15

This table reports the cross-sectional regression results for the sample of *International* seasoned CCS on the *NASDAQ* and *the NYSE/AMEX* at the *announcement* date. The abnormal returns are regressed on the size of the offering at the announcement date, private (firm-specific) and public information variables as follows:

$$ADAR_i = a_0 + (a_1 + \delta_{OFFSIZE}XY)OFFSIZE_i + (a_2 + \delta_{CHCAR}XY)CHCAR_i + (a_3 + \delta_{CHTO}XY)CHTO_i + (a_4 + \delta_{CHABVOL}XY)CHABVOL_i + (a_5 + \delta_{CHABESPREAD}XY)CHABESPREAD_i + (a_6 + \delta_{CHTRADES}XY)CHTRADES_i + (a_7 + \delta_{ADB}XY)ADB_i + (a_8 + \delta_{ADG}XY)ADG_i + (a_9 + \delta_{DNS}XY)DNS_i + \varepsilon_i$$

$ADAR_i$ is the cumulative abnormal return for the three-day announcement date, [AD-1, AD+1], for firm *i*. $OFFSIZE_i$ is the size of the seasoned offering divided by the total number of shares outstanding before the announcement date. Panel A reports the regression results when the information variables are equal to the change in the average value between the pre-announcement sample periods [AD-150, AD-2] and [AD-75, AD-2] for firm *i*. $CHCAR_i$ is the change in cumulative prior abnormal returns. *CHTO* is the change in the volume turnover. *XY* is a dummy variable that takes the value of one for the announcements of international SEOs in the *NYSE/AMEX*, and is zero for international SEOs in the *NASDAQ*. *CHABVOL* is the change in the average of the differences of the daily actual and expected trading volumes. For each announcement, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. $CHABESPREAD_i$ is the abnormal effective half-spread and is equal to the difference between the daily actual and expected effective bid-ask half-spreads where the expectation is obtained using an ARMA model. $CHTRADES_i$ is the change in the number of trades. ADB_i (ADG_i) is a dummy variable that equals one for press articles deemed unfavorable (favorable) for firm i around the announcement date [AD-10, AD+5], and is zero otherwise. DNS_i is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering. The error term ε_i is assumed to be i.i.d. ~ N (0, σ^2). Panel B reports the regression results using as information variables their average values during the period [AD-75, AD-2]. The variables are denoted as *PreCAR, TO, ABVOL, ABESPREAD,* and *TRADES*. The cells report the mean coefficients and the p-values below. Tests for significance use Newey and West (1987) robust t-statistics. Columns (1) to (6) report the results by using different combinations of variables to assess whether some of them subsume others. The adjusted R squares and the probability (F-statistic) values are reported in the last row of each column. *, **, and *** indicate significance at the10, 5 and 1 percent levels, respectively.

Panel A

	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	-0.0140	(0.4948)	-0.0140	(0.6201)	-0.0160	(0.4240)	-0.0117	(0.7194)	-0.0136	(0.4721)	-0.0183	(0.5600)
OFFSIZE	-0.0643	(0.1601)	-0.0780	(0.2831)	-0.0532	(0.3396)	-0.1042	(0.3007)	-0.0632	(0.1500)	-0.0460	(0.5203)
*OFFSIZE *XY*			0.0080	(0.8902)			0.0259	(0.7662)			-0.0281	(0.5624)
CHCAR	-0.0310	(0.5962)	-0.0982	(0.0055)***	-0.0436	(0.4722)	-0.0978	(0.0606)*	-0.0456	(0.4418)	-0.1112	(0.0181)**
*CHCAR*XY*			0.1653	(0.0220)**			0.1515	(0.1244)			0.1078	(0.3850)
CHTO					0.0348	(0.3347)	0.0504	(0.2453)				
*CHTO*XY*							0.0432	(0.6153)				
CHABVOL					-3E-07	(0.3576)	-1.4-06	(0.3194)				
*CHABVOL*XY*							1.1E-06	(0.4497)				
CHABESPREAD									0.0103	(0.8785)	0.0913	(0.0058)***
*CHABESPREAD*XY*											-0.2596	(0.1662)
CHTRADES									0.0003	(0.2370)	0.0003	(0.3644)
*CHTRADES*XY*											-5E-05	(0.9402)
ADB	-0.0461	(0.0070)***	-0.0583	(0.0723)*	-0.0458	(0.0267)**	-0.0576	(0.1534)	-0.0458	(0.0237)**	-0.0447	(0.3022)
*ADB*XY*			0.0129	(0.7364)			0.0087	(0.8719)			0.0053	(0.9059)
ADG	0.0087	(0.4299)	0.0080	(0.6918)	0.0124	(0.3421)	0.0165	(0.5033)	0.0079	(0.4904)	0.0088	(0.6170)
*ADG*XY*			0.0056	(0.8437)			0.0052	(0.8713)			0.0060	(0.8157)
DNS	0.0145	(0.3612)	0.0394	(0.0350)**	0.0133	(0.4269)	0.0357	(0.0970)*	0.0091	(0.5973)	0.0380	(0.0177)**
*DNS*XY*	-0.0140	(0.4948)	-0.0366	(0.0641)*			-0.0420	(0.0211)**			-0.0365	(0.1240)
R^2 Adj.	0.084		0.084		0.057		0.063		0.067		0.018	
F (Prob)	0.146		0.235		0.255		0.332		0.227		0.434	

Table 3-15 (Continued)

	Panel B											
	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	-0.0147	(0.5605)	-0.0020	(0.9570)	-0.0315	(0.2290)	-0.0290	(0.5073)	-0.0140	(0.5994)	-0.0149	(0.6992)
OFFSIZE	-0.0658	(0.1554)	-0.0890	(0.2760)	-0.0731	(0.2024)	-0.0941	(0.2325)	-0.0637	(0.2289)	-0.0605	(0.4268)
*OFFSIZE*XY*			0.0105	(0.8657)			0.0012	(0.9864)			0.0068	(0.8981)
PreCAR	0.0168	(0.7795)	-0.0580	(0.4379)	-0.0069	(0.8997)	-0.0181	(0.8623)	0.0141	(0.8177)	-0.1062	(0.0652)*
*PreCAR*XY*			0.1114	(0.2479)			0.0636	(0.5664)			0.1576	(0.0222)**
TO					0.0624	(0.0375)**	0.0792	(0.0202)**				
*TO*XY*							0.0036	(0.9571)				
ABVOL					-3E-07	(0.1906)	-1.4E-6	(0.1708)				
*ABVOL*XY*							1.2E-6	(0.2556)				
ABESPREAD									0.0395	(0.7137)	0.1233	(0.0038)***
*ABESPREAD*XY*											-0.3761	(0.1213)
TRADES									2.96E-5	(0.7778)	0.0006	(0.0502)*
*TRADES*XY*											-0.0006	(0.0896)*
ADB	-0.0490	(0.0025)***	-0.0674	(0.0124)**	-0.0476	(0.0059)***	-0.0445	(0.1895)	-0.0489	(0.0052)***	-0.0472	(0.1181)
*ADB*XY*			0.0214	(0.4697)			-0.0058	(0.8917)			0.0144	(0.6534)
ADG	0.0088	(0.4703)	0.0023	(0.9287)	0.0116	(0.3704)	-0.0053	(0.8377)	0.0071	(0.5924)	0.0028	(0.8977)
*ADG*XY*			0.0068	(0.8349)			0.0230	(0.5021)			0.0102	(0.7079)
DNS	0.0112	(0.4632)	0.0274	(0.1412)	0.0062	(0.7060)	0.0109	(0.5093)	0.0105	(0.5197)	0.0173	(0.3489)
*DNS*XY*			-0.0342	(0.2883)			-0.0245	(0.5279)			-0.0261	(0.4456)
R^2 Adj.	0.071		-0.016		0.108		-0.020		0.022		-0.045	
F (Prob)	0.176		0.518		0.139		0.532		0.365		0.593	

Table 3-16

This table reports the cross-sectional regression results for the sample of *Domestic* seasoned CCS on the NASDAQ and the NYSE/AMEX at the *issue* date. The abnormal returns are regressed on the size of the offering at the announcement date, private (firm-specific) and public information variables as follows

$$IDAR_i = a_0 + (a_1 + \delta_{OFFSIZE}XY)OFFSIZE_i + (a_2 + \delta_{ADAR}XY)ADAR_i + (a_3 + \delta_{ADAR}XY)DINT_i + (a_4 + \delta_{CHCAR}XY)CHCAR_i + (a_5 + \delta_{CHTO}XY)CHTO_i + (a_6 + \delta_{CHABVOL}XY)CHABVOL_i + (a_7 + \delta_{CHABESPREAD}XY)CHABESPREAD_i + (a_8 + \delta_{CHTRADES}XY)CHTRADES_i + (a_9 + \delta_{ADB}XY)IDB_i + (a_{10} + \delta_{AIX}XY)IDG_i + (a_{11} + \delta_{DNS}XY)DNS_i + \varepsilon_i$$

$IDAR_i$ is the cumulative abnormal return for the three-day actual or expected issue date, [ID-1, ID+1], for firm i. $ADAR_i$ is the cumulative abnormal return for the three-day announcement date, [AD-1, AD+1], for firm i. $DINT_i$ is the cumulative abnormal return for the period two days after the announcement date to two days before the actual or issue date, [ID+2, ID-2]. $OFFSIZE_i$ is the size of the seasoned offering divided by the total number of shares outstanding before the announcement date. Panel A reports the regression results when the information variables are equal to the change in the average value between the pre-announcement sample periods [AD-150, AD-2] and [AD-75, AD-2] for firm i. $CHCAR_i$ is the change in cumulative prior abnormal return. $CHTO$ is the change in the volume turnover. XY is a dummy variable that takes the value of one for the announcements of domestic SEOs in the *NYSE/AMEX*, and is zero for domestic SEOs in the *NASDAQ*. $CHABVOL$ is the change in the average of the differences of the daily actual and expected trading volumes. For each announcement, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. $CHABESPREAD_i$ is the abnormal effective half-spread and is equal to the difference between the daily actual and expected effective bid-ask half-spreads where the expectation is obtained using an ARMA model. $CHTRADES_i$ is the change in the number of trades. IDB_i (IDG_i) is a dummy variable that equals one for press articles deemed unfavorable (favorable) for firm i around the issue date [AD+6, ID+5], and is zero otherwise. DNS_i is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering. The error term ε_i is assumed to be i.i.d. ~ N (0, σ^2). Panel B reports the regression results using as information variables their average values during the period [AD-75, AD-2]. The variables are denoted as *PreCAR, TO, ABVOL, ABESPREAD*, and *TRADES*. The cells report the mean coefficients and the p-values below. Tests for significance use Newey and West (1987) robust t-statistics. Columns (1) to (6) report the results by using different combinations of variables to assess whether some of them subsume others. The adjusted R squares and the probability (F-statistic) values are reported in the last row of each column. *, **, and *** indicate significance at the 10, 5 and 1 percent levels, respectively.

Panel A

	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	0.0105	(0.2675)	0.0143	(0.1355)	0.0108	(0.2589)	0.0137	(0.1787)	0.0082	(0.3870)	0.0140	(0.1324)
OFFSIZE	-0.0159	(0.5652)	-0.0428	(0.0332)**	-0.0134	(0.6355)	-0.0229	(0.1177)	-0.0130	(0.6310)	-0.0397	(0.0142)**
*OFFSIZE*XY*			0.0747	(0.1879)			0.0571	(0.3131)			0.0793	(0.1315)
CHCAR	-0.0825	(0.0473)**	-0.1199	(0.0150)**	-0.0926	(0.0373)**	-0.1408	(0.0172)**	-0.0921	(0.0631)*	-0.1379	(0.0278)**
*CHCAR*XY*			0.1039	(0.0626)*			0.1280	(0.0590)*			0.1151	(0.1084)
ADAR	0.0378	(0.7720)	-0.1006	(0.5596)	-0.0029	(0.9832)	-0.1339	(0.3821)	0.0003	(0.9982)	-0.0889	(0.6506)
*ADAR*XY*			0.3439	(0.0755)*			0.3994	(0.0291)**			0.2389	(0.2516)
DINT	0.0432	(0.5388)	-0.0108	(0.9154)	0.0420	(0.5460)	-0.0320	(0.7671)	0.0384	(0.5524)	-0.0110	(0.9128)
*DINT*XY*			0.0100	(0.9359)			0.0282	(0.8264)			0.0054	(0.9635)
CHTO					0.0396	(0.3247)	0.0792	(0.3002)				
*CHTO*XY*							-0.0948	(0.2596)				
CHABVOL					-2E-07	(0.3917)	-9E-07	(0.1274)				
*CHABVOL*XY*							10E-07	(0.1025)				
CHABESPREAD									-0.0523	(0.3911)	-0.0332	(0.6870)
*CHABESPREAD*XY*											-0.0891	(0.3967)
CHTRADES									0.0000	(0.9845)	0.0004	(0.2166)
*CHTRADES*XY*											-0.0006	(0.1658)
IDB	-0.0150	(0.2671)	-0.0282	(0.2437)	-0.0158	(0.2493)	-0.0252	(0.2483)	-0.0177	(0.2650)	-0.0331	(0.4143)
*IDB*XY*			0.0225	(0.3575)			0.0206	(0.3587)			0.0306	(0.4578)
IDG	-0.0045	(0.6747)	0.0159	(0.4400)	-0.0071	(0.4606)	0.0165	(0.3481)	-0.0047	(0.6212)	0.0103	(0.5794)
*IDG*XY*			-0.0218	(0.3451)			-0.0220	(0.2786)			-0.0122	(0.5473)
DNS	0.0004	(0.9611)	-0.0084	(0.4461)	-0.0007	(0.9398)	-0.0173	(0.1795)	0.0037	(0.7220)	-0.0072	(0.6754)
*DNS*XY*			0.0006	(0.9648)			0.0096	(0.4817)			-0.0002	0.9923
R^2 Adj.	0.076		0.140		0.082		0.160		0.075		0.144	
F (Prob)	0.027		0.007		0.032		0.007		0.041		0.012	

Table 3-16 (Continued)

Panel B												
	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	0.0156	(0.0751)*	0.0151	(0.0828)*	0.0054	(0.6394)	0.0107	(0.3676)	0.0045	(0.5933)	0.0067	(0.3858)
OFFSIZE	-0.0102	(0.6950)	-0.0288	(0.1382)	-0.0066	(0.8035)	-0.0372	(0.0799)*	0.0006	(0.9838)	-0.0147	(0.3993)
*OFFSIZE*XY*			0.0615	(0.2851)			0.0772	(0.2346)			0.0545	(0.3453)
PreCAR	-0.1192	(0.0060)***	-0.1468	(0.0009)***	-0.1323	(0.0060)***	-0.1664	(0.0076)***	-0.1238	(0.0048)***	-0.1486	(0.0019)***
*PreCAR*XY*			0.1277	(0.0272)**			0.1458	(0.0343)**			0.1160	(0.0657)*
ADAR	0.0224	(0.8704)	-0.1199	(0.5052)	0.0034	(0.9809)	-0.1612	(0.3881)	0.0374	(0.7839)	-0.0759	(0.6531)
*ADAR*XY*			0.3587	(0.0816)*			0.3863	(0.0578)*			0.3205	(0.0994)*
DINT	0.0231	(0.7486)	-0.0410	(0.7098)	0.0107	(0.8803)	-0.0574	(0.5596)	0.0193	(0.7861)	-0.0394	(0.7352)
*DINT*XY*			0.0372	(0.7774)			0.0438	(0.7192)			0.0361	(0.7918)
TO					0.0324	(0.1972)	0.0.0612	(0.3546)				
*TO*XY*							-0.0528	(0.4207)				
ABVOL					1.2E-07	(0.3258)	5E-07	(0.0656)*				
*ABVOL*XY*							-3E-07	(0.3175)				
ABESPREAD									0.0041	(0.8968)	0.0105	(0.7904)
*ABESPREAD*XY*											0.0275	(0.6560)
TRADES									0.0001	(0.0371)**	0.0004	(0.0972)*
*TRADES*XY*											-0.0003	(0.2091)
IDB	-0.0140	(0.2578)	-0.0123	(0.5168)	-0.0220	(0.1559)	0.0015	(0.8702)	-0.0307	(0.0714)*	0.0026	(0.9123)
*IDB*XY*			0.0065	(0.7444)			-0.0182	(0.1829)			-0.0260	(0.3382)
IDG	-0.0103	(0.3300)	-0.0003	(0.9862)	-0.0118	(0.2832)	-0.0061	(0.6931)	-0.0124	(0.2552)	-0.0072	(0.7116)
*IDG*XY*			-0.0060	(0.7718)			-0.0020	(0.9128)			-0.0008	(0.9718)
DNS	0.0002	(0.9801)	-0.0024	(0.8466)	-0.0029	(0.7409)	-0.0149	(0.2182)	0.0037	(0.6850)	-0.0074	(0.6008)
*DNS*XY*			-0.0056	(0.7115)			0.0079	(0.6201)			0.0019	(0.9023)
R^2 Adj.	0.108		0.153		0.135		0.183		0.119		0.145	
F (Prob)	0.006		0.004		0.003		0.002		0.006		0.011	

Table 3-17

This table reports the cross-sectional regression results for the sample of *International* seasoned CCS on the *NASDAQ* and *NYSE/AMEX* at the *issue* date. The abnormal returns are regressed on the size of the offering at the announcement date, private (firm-specific) and public information variables as follows:

$$IDAR_i = a_0 + (a_1 + \delta_{OFFSIZE}XY)OFFSIZE_i + (a_2 + \delta_{ADAR}XY)ADAR_i + (a_3 + \delta_{ADAR}XY)DINT_i + (a_4 + \delta_{CHCAR}XY)CHCAR_i + (a_5 + \delta_{CHTO}XY)CHTO_i + (a_6 + \delta_{CHABVOL}XY)CHABVOL_i + (a_7 + \delta_{CHABESPREAD}XY)CHABESPREAD_i + (a_8 + \delta_{CHTRADES}XY)CHTRADES_i + (a_9 + \delta_{ADB}XY)IDB_i + (a_{10} + \delta_{AIX}XY)IDG_i + (a_{11} + \delta_{DNS}XY)DNS_i + \varepsilon_i$$

IDAR$_i$ is the cumulative abnormal return for the three-day actual or expected issue date, [ID-1, ID+1], for firm *i*. *ADAR*$_i$ is the cumulative abnormal return for the three-day announcement date, [AD-1, AD+1], for firm *i*. *DINT*$_i$ is the cumulative abnormal return for the period two days after the announcement date to two days before the actual or issue date, [ID+2, ID-2]. *OFFSIZE*$_i$ is the size of the seasoned offering divided by the total number of shares outstanding before the announcement date. Panel A reports the regression results when the information variables are equal to the change in the average value between the pre-announcement sample periods [AD-150, AD-2] and [AD-75, AD-2] for firm *i*. *CHCAR*$_i$ is the change in cumulative prior abnormal return. *CHTO* is the change in the volume turnover. *XY* is a dummy variable that takes the value of one for the announcements of international SEOs in the *NYSE/AMEX*, and is zero for international SEOs in the *NASDAQ*. *CHABVOL* is the change in the average of the differences of the daily actual and expected trading volumes. For each announcement, the estimation of the expected trading volume is obtained from the best-fitted ARMA model based on the actual trading volume so that the residuals are 'white' noise. *CHABESPREAD*$_i$ is the abnormal effective half-spread and is equal to the difference between the daily actual and expected effective bid-ask half-spreads where the expectation is obtained using an ARMA model. *CHTRADES*$_i$ is the change in the number of trades. *IDB*$_i$ (*IDG*$_i$) is a dummy variable that equals one for press articles deemed unfavorable (favorable) for firm i around the issue date [AD+6, ID+5], and is zero otherwise. *DNS*$_i$ is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering. The error term ε_i is assumed to be i.i.d. ~ N (0, σ^2). Panel B reports the regression results using as information variables their average values during the period [AD-75, AD-2]. The variables are denoted as *PreCAR, TO, ABVOL, ABESPREAD*, and *TRADES*. The cells report the mean coefficients and the p-values below. Tests for significance use Newey and West (1987) robust t-statistics. Columns (1) to (6) report the results by using different combinations of variables to assess whether some of them subsume others. The adjusted R squares and the probability (F-statistic) values are reported in the last row of each column. *, **, and *** indicate significance at the10, 5 and 1 percent levels, respectively.

Panel A

	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	-0.0073	(0.7604)	-0.0127	(0.6452)	-0.0090	(0.7290)	-0.0178	(0.4959)	-0.0086	(0.7378)	-0.0140	(0.6315)
OFFSIZE	0.0219	(0.5538)	-0.0081	(0.9139)	0.0248	(0.5761)	0.0843	(0.5117)	0.0171	(0.6206)	0.0181	(0.8445)
*OFFSIZE*XY*			0.0263	(0.6778)			-0.0513	(0.6775)			-0.0008	(0.9921)
CHCAR	-0.0451	(0.4872)	0.0568	(0.5449)	-0.0431	(0.5437)	-0.0528	(0.6611)	-0.0676	(0.3469)	-0.0181	(0.8545)
*CHCAR*XY*			-0.0721	(0.5039)			0.0435	(0.7447)			-0.0682	(0.6255)
ADAR	-0.1975	(0.2054)	0.4000	(0.3957)	-0.2041	(0.1636)	0.4221	(0.2967)	-0.2386	(0.0858)*	0.0853	(0.8365)
*ADAR*XY*			-0.6521	(0.1827)			-0.6731	(0.1120)			-0.4119	(0.3417)
DINT	-0.0456	(0.4780)	-0.1350	(0.1424)	-0.0463	(0.4949)	-0.2095	(0.3039)	-0.0599	(0.3262)	-0.1492	(0.2744)
*DINT*XY*			0.1533	(0.1417)			0.2274	(0.2828)			0.1610	(0.2714)
CHTO					0.0084	(0.8353)	0.0684	(0.6544)				
*CHTO*XY*							-0.0768	(0.6206)				
CHABVOL					-2E-07	(0.4869)	1.7E-06	(0.7030)				
*CHABVOL*XY*							-1.9E-06	(0.6744)				
CHABESPREAD									0.0019	(0.9817)	0.0949	(0.4311)
*CHABESPREAD*XY*											-0.3085	(0.1219)
CHTRADES									0.0004	(0.1349)	0.0012	(0.0041)***
*CHTRADES*XY*											-0.0011	(0.0186)**
IDB	0.0482	(0.0879)*	0.0825	(0.0002)***	0.0496	(0.0591)*	0.0541	(0.1765)	0.0467	(0.1153)	0.0642	(0.0008)***
*IDB*XY*			-0.1486	(0)***			-0.1117	(0.0134)**			-0.1052	(0.0019)***
IDG	0.0051	(0.8081)	0.0567	(0.2042)	0.0057	(0.7937)	0.0574	(0.3216)	0.0074	(0.7344)	0.0423	(0.3535)
*IDG*XY*			-0.0641	(0.1502)			-0.0636	(0.2859)			-0.0506	(0.2677)
DNS	0.0088	(0.5864)	-0.0248	(0.3611)	0.0103	(0.5867)	-0.0163	(0.6475)	0.0023	(0.9051)	-0.0147	(0.4531)
*DNS*XY*			0.0444	(0.2101)			0.0400	(0.3298)			0.0318	(0.2433)
R^2 Adj.	-0.025		0.059		-0.080		0.011		0.045		0.027	
F (Prob)	0.552		0.339		0.735		0.470		0.618		0.438	

Table 3-17 (Continued)

Panel B												
	(1)		(2)		(3)		(4)		(5)		(6)	
VARIABLES	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
CONSTANT	-0.0172	(0.5081)	-0.0317	(0.0917)*	-0.0234	(0.3668)	-0.0470	(0.1278)	-0.0162	(0.5124)	-0.0278	(0.2021)
OFFSIZE	0.0347	(0.3246)	0.0762	(0.3800)	0.0315	(0.4003)	-0.0181	(0.8185)	0.0329	(0.4001)	0.0646	(0.4612)
*OFFSIZE*XY*			-0.0392	(0.6086)			0.0812	(0.3877)			-0.0231	(0.7793)
PreCAR	0.0965	(0.2592)	0.3044	(0.1151)	0.0891	(0.3362)	0.4959	(0.1650)	0.0944	(0.2739)	0.2860	(0.3027)
*PreCAR*XY*			-0.2922	(0.1350)			-0.4740	(0.1799)			-0.2646	(0.3439)
ADAR	-0.1658	(0.3218)	0.2956	((0.4419)	-0.1926	(0.2843)	0.2242	(0.5294)	-0.1789	(0.2731)	0.2330	(0.6181)
*ADAR*XY*			-0.5738	(0.1631)			-0.5164	(0.1764)			-0.5020	(0.3076)
DINT	-0.0203	(0.7560)	-0.0498	(0.3005)	-0.0149	(0.8234)	0.0033	(0.9479)	0.0224	(0.7060)	-0.0494	(0.3533)
*DINT*XY*			0.0564	(0.4038)			-0.0278	(0.7562)			0.0675	(0.2794)
TO					0.0264	(0.5855)	0.0312	(0.6971)				
*TO*XY*							-0.0492	(0.5401)				
ABVOL					-1E-7	(0.6690)	-3E-06	(0.2286)				
*ABVOL*XY*							-1E-07	(0.2005)				
ABESPREAD									0.0918	(0.4812)	0.0739	(0.7554)
*ABESPREAD*XY*											-0.0384	(0.8861)
TRADES									1.2E-06	(0.9921)	-10E-06	(0.9909)
*TRADES*XY*											-0.0001	(0.9316)
IDB	0.0459	(0.1289)	0.0534	(0.1007)	0.0418	(0.2067)	0.0665	(0.0019)***	0.0511	(0.1368)	0.0603	(0.1496)
*IDB*XY*			-0.1257	(0.0006)***			-0.1452	(0.0000)***			-0.1361	(0.0033)***
IDG	0.0041	(0.8130)	0.0108	(0.7343)	0.0043	(0.8231)	0.0290	(0.4736)	0.0052	(0.7635)	0.0137	(0.7111)
*IDG*XY*			-0.0134	(0.6796)			-0.0252	(0.5206)			-0.0200	(0.5922)
DNS	0.0038	(0.8396)	-0.0080	(0.7912)	0.0012	(0.9590)	-0.0378	(0.4019)	0.0052	(0.8029)	-0.0093	(0.8200)
*DNS*XY*			0.0391	(0.2729)			0.0839	(0.1444)			0.0452	(0.3274)
R^2 Adj.	-0.0005		0.206		-0.053		0.210		-0.051		0.080	
F (Prob)	0.450		0.1009		0.646		0.140		0.639		0.337	

Table 4-1

This table reports the descriptive statistics for the Total, Domestic and Non-domestic seasoned (primary and secondary) equity offerings (SEOs) by Canadian issuers with shares cross-listed on the NYSE, AMEX and NASDAQ for each year during the period, 1993-1998. Exchange reports the number of SEOs for the shares cross-listed on the NYSE/AMEX and NASDAQ, respectively. Fee is the mean underwriter fee (gross spread) expressed in percent. The mean values of Gross Proceeds and Firm Size are in Canadian dollars as of December 1998 based on the Consumer Price Index. The Terms of the SEOs are firm commitment (FC), best efforts (BE), and bought deal (BD). The last column reports the number of seasoned primary equity offerings (PE). Panels A, B and C report the descriptive statistics for the total, domestic and non-domestic SEOs, respectively. No non-domestic SEOs are floated in 1994. N is the sample size.

		Exchange			(In Millions of 1998 $Cdn)		Terms			
YEAR	Number of SEOs	NYSE/AMEX	NASDAQ	Mean Fee (%)	Gross Proceeds	Firm Size	FC	BE	BD	PE
Panel A: Total SEOs (N = 146)										
1993	34	23	11	4.40	$74.3	$772.5	24	1	9	30
1994	12	7	5	4.21	$47.5	$444.2	5	1	6	9
1995	17	8	9	4.39	$97.4	$739.5	5	5	7	11
1996	30	15	15	4.71	$136.2	$1,131.1	22	2	6	24
1997	28	13	15	4.50	$179.9	$1,122.9	10	1	17	20
1998	25	14	11	4.27	$132.3	$1,672.3	4	2	19	22
Panel B: Domestic SEOs (N = 109)										
1993	31	20	11	4.33	$76.5	$758.6	21	1	9	27
1994	12	7	5	4.21	$47.5	$444.2	5	1	6	9
1995	10	4	6	4.14	$57.0	$394.6	3	2	5	8
1996	18	10	8	4.54	$103.8	$952.2	11	1	6	15
1997	17	4	13	4.37	$115.1	$672.8	4	1	12	11
1998	21	12	9	4.20	$114.7	$1,524.4	2	2	17	20
Panel C: Non-domestic SEOs (N = 37)										
1993	3	3	0	5.03	$50.9	$916.2	3	0	0	3
1994	0	0	0	-	-	-	-	-	-	-
1995	7	4	3	4.75	$155.2	$1,232.1	2	3	2	3
1996	12	5	7	4.97	$184.9	$1,399.4	11	1	0	9
1997	11	9	2	4.70	$280.0	$1,818.5	6	0	5	9
1998	4	2	2	4.62	$224.5	$2,448.8	2	0	2	2

Table 4-2

This table reports the distribution of Total, Domestic and Non-domestic seasoned (primary and secondary) equity offerings (SEOs) for various categories of Gross Proceeds. The table also reports the mean values for the Fees and Firm Size for every category. Fee is equal to the underwriter fee (gross spread) in percent. Gross Proceeds and Firms Size are in millions of Canadian dollars as of December 1998 based on the Consumer Price Index. Panels A, B and C report the values for the Total, Domestic and Non-domestic SEOs, respectively. N refers to the sample size.

Relative Frequency	Number of SEOs	Gross Proceeds (Millions 1998 $Cdn)	Mean Fee (%)	Mean Gross Proceeds (Millions 1998 $Cdn)	Firm Size (Millions 1998 $Cdn)
		Panel A: Total SEOs (N = 146)			
15.1%	22	<20	5.11	10.6	87.8
41.8%	61	≥20 & <80	4.62	45.0	419.5
9.6%	14	≥80 & <100	4.26	86.6	806.5
15.1%	22	≥100 & <200	4.09	134.3	1,429.3
11.0%	16	≥200 & <300	4.12	222.5	2,597.4
7.5%	11	≥300	3.87	588.4	3,588.6
		Panel B: Domestic SEOs (N = 109)			
18.3%	20	<20	4.90	5.2	85.4
46.8%	51	≥20 & <80	4.38	43.5	409.8
9.2%	10	≥80 & <100	3.87	83.9	900.4
15.6%	17	≥100 & <200	3.89	137.6	1,481.2
6.4%	7	≥200 & <300	4.00	225.4	2,581.6
3.7%	4	≥300	4.00	639.3	4,630.2
		Panel C: Non-domestic SEOs (N = 37)			
5.4%	2	<20	5.25	19.5	143.0
27.0%	10	≥20 & <80	5.82	52.8	468.8
10.8%	4	≥80 & <100	5.25	93.6	571.9
13.5%	5	≥100 & <200	4.78	123.1	1,252.6
24.3%	9	≥200 & <300	4.22	220.3	2,609.6
18.9%	7	≥300	3.80	559.3	2,993.4

Table 4-3

This table reports the descriptive statistics for underwriter fees and its expected determinants for the Total, Domestic and Non-domestic (global) seasoned (primary and secondary) equity offerings (SEOs) by the Canadian issuers with shares cross-listed on the NYSE, AMEX and NASDAQ. The determinants are defined as follows. *FEE* is the underwriter fee (gross spread) expressed in percent. It is equal to $[(P^0-P^i)/P^0]*100$, where P^0 is the offering price to the market and P^i is the price paid to the issuer. *GP* is gross proceeds and is equal to the offering price times the number of shares issued. *ME* is the market value of the equity of the issuer, and proxies for firm size. It is equal to the offering price times the number of shares outstanding before the SEO announcement. *GP* and *ME* are expressed in millions of dollars as of December 1998. *STD3* is the daily standard deviation of returns for the period consisting of the three months prior to the SEO announcement. It proxies for return volatility. *OFFSIZE* is the relative size of the offering. It is equal to the shares offered divided by the number of outstanding shares. *NOFFSC* corresponds to the number of such SEOs floated by the lead underwriter, where the number of non-domestic issues is scaled (adjusted) to be comparable with those for domestic issues. It proxies for underwriter prestige. Finally, *NU* corresponds to the number of underwriters. It proxies for underwriter effort. Column (1) displays the mean (median) values of each determinant for the Total sample of SEOs. Columns (2), (3) and (4) report the mean (median) values of each determinant and the *p*-values of their difference for the Domestic and Non-domestic SEOs. Columns (5), (6) and (7) display similar statistics for the Domestic SEOs by issuers with shares cross-listed on the NYSE/AMEX and NASDAQ. Finally, columns (8), (9) and (10) report similar statistics for the Non-domestic SEOs by firms with shares cross-listed on the NYSE/AMEX and NASDAQ. T- and Wilcoxon/Mann-Whitney tests are used to test the difference in means and medians, respectively. The medians and the *p*-values of their differences are reported in parentheses. *, **, and *** correspond to levels of significance of 10, 5 and 1 percent, respectively. Sample sizes are reported in the brackets.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Total SEOs			Domestic SEOs			Non-domestic SEOs		
Variables	Total SEOs [146]	Domestic [109]	Non-domestic [37]	*p*-value, difference	NYSE/AMEX [57]	NASDAQ [52]	*p*-value, difference	NYSE/AMEX [23]	NASDAQ [14]	*p*-value, difference
FEE	4.44	4.32	4.82	0.003***	4.07	4.59	0.001***	4.30	5.67	0.000***
	(4.00)	(4.00)	(4.75)	(0.003)***	(4.00)	(4.31)	(0.004)***	(4.00)	(6.00)	(0.000)***
GP	$117.7	$89.4	$201.0	0.001***	$124.8	$50.6	0.004***	$261.0	$102.4	0.082*
	($64.2)	($51.0)	($128.9)	(0.000)***	($76.9)	($32.5)	(0.000)***	($205.5)	($71.5)	(0.008)***
ME	$1,036.6	$856.7	$1,566.6	0.009***	$1,242.8	$433.5	0.002***	$2,175.1	$566.9	0.002***
	($475.0)	($343.4)	($982.0)	(0.001)***	($642.6)	($159.8)	(0.000)***	($1,902.7)	($259.2)	(0.000)***
STD3	0.0292	0.0294	0.0287	0.842	0.0266	0.0324	0.062*	0.0221	0.0397	0.000***
	(0.0237)	(0.0233)	(0.0247)	(0.932)	(0.0216)	(0.0256)	(0.032)**	(0.0203)	(0.0387)	(0.001)***
OFFSIZE	0.201	0.205	0.189	0.692	0.155	0.260	0.013**	0.139	0.272	0.012**
	(0.120)	(0.122)	(0.118)	(0.886)	(0.109)	(0.185)	(0.022)**	(0.111)	(0.224)	(0.004)***
NOFFSC	10.22	10.52	(9.31)	(0.263)	10.58	10.46	0.910	12.50	(4.07)	0.000***
	(10.43)	(12.00)	(8.14)	(0.234)	(12.00)	(12.00)	(0.990)	(10.85)	(2.71)	(0.000)***
NU	2.71	2.85	2.29	0.077*	3.052	2.63	0.235	2.52	1.92	0.036**
	(2.00)	(2.00)	(2.0)	(0.267)	(2.00)	(2.0)	(0.293)	(2.00)	(2.00)	(0.031)**

Table 4-4

This table reports the results of various regressions of underwriter fees against the expected determinants for the Total, Domestic and Non-domestic or global (primary and secondary) equity offerings (SEOs) for the Canadian issuers with shares cross-listed on the NYSE, AMEX and NASDAQ. The cross-sectional regression model used for regressions (1) and (2) is as follows:

$$FEE_i = \beta_0 + (\beta_1 + \lambda_{NASD}GLO)NASD_i + (\beta_2 + \lambda_{LnGP}GLO)LnGP_i + (\beta_3 + \lambda_{ME}GLO)ME_i + (\beta_4 + \lambda_{STD3}GLO)STD3_i + (\beta_5 + \lambda_{OFFSIZE}GLO)OFFSIZE_i + (\beta_6 + \lambda_{NOFFSC}GLO)NOFFSC_i + (\beta_7 + \lambda_{NU}GLO)NU_i + (\beta_8 + \lambda_{OAO}GLO)OAO_i + (\beta_9 + \lambda_{DNS}GLO)DNS_i + \varepsilon_i \quad (1)$$

$$FEE_i = \beta_0 + (\beta_1 + \lambda_{NYAM}DOM)NYAM_i + (\beta_2 + \lambda_{LnGP}DOM)LnGP_i + (\beta_3 + \lambda_{ME}DOM)ME_i + (\beta_4 + \lambda_{STD3}DOM)STD3_i + (\beta_5 + \lambda_{OFFSIZE}DOM)OFFSIZE_i + (\beta_6 + \lambda_{NOFFSC}DOM)NOFFSC_i + (\beta_7 + \lambda_{NU}DOM)NU_i + (\beta_8 + \lambda_{DNS}DOM)DNS_i + (\beta_9 + \lambda_{DNS}DOM)DNS_i + \varepsilon_i \quad (2)$$

The subscript i refers to issue i. *FEE* is the underwriter fee (gross spread) expressed in percent. It is equal to $[(P^0-P^1)/P^0]*100$, where P^0 is the offering price to the market and P^1 is the price paid to the issuer. *NASD* (*NYAM*) is a dummy variable that equals one if the issuer has shares cross-listed on NASDAQ (NYSE/AMEX), and is zero otherwise. *GLO* (*DOM*) is a dummy variable that is equal to one for the Non-domestic (domestic) SEOs, and is zero otherwise. *LnGP* is the natural logarithm of the gross proceeds (*GP*), which is equal to the offering price times the number of shares issued. *ME* is the market value of the equity of the issuer and proxies for firm size. It is equal to the offering price times the number of shares outstanding before the SEO announcement. *GP* (*ME*) are expressed in (billions of) dollars as of December 1998. *STD3* is the daily standard deviation of returns for the three months prior to the SEO announcement. *OFFSIZE* is the relative size of the offering and it is equal to the shares offered divided by the number of shares outstanding. *NOFFSC* correspond to the number of SEOs by Canadian issuers with shares listed on U.S. markets that are floated by the lead underwriter. It is a proxy for underwriter prestige. NU_i is the number of underwriters of Canadian shares cross-listed on the U.S. of issue i, where higher NU_i implies higher underwriter effort. OAO_i is a dummy variable that is equal to one if issue i has on overallotment option, and is zero otherwise. DNS_i is a dummy variable that is equal to one if issue i is a primary seasoned equity offering and is zero if it is a secondary offering. The cells report the estimated coefficients (Coef.) and their associated p-values (p-value) based on tests for significance using Newey and West robust t-statistics. The adjusted R^2 and the probability (F-statistic) values are reported in the last two rows of each column. *, **, and *** indicate significance at levels of 10, 5, and 1 percent, respectively.

	(1)		(2)	
VARIABLES	Coef.	p-value	Coef.	p-value
CONSTANT	4.6899	0.0000***	5.0916	0.0000***
NASD or NYAM	0.2240	0.1045	-1.0484	0.0000***
*NASD*GLO or NYAM*DOM*	0.9217	0.0007***	0.8243	0.0028***
LnGP	-0.3721	0.0000***	-0.0884	0.4366
ME	0.0001	0.0171**	-0.0003	0.0000***
STD3	13.9554	0.0219**	5.3691	0.4744
OFFSIZE	0.7304	0.0102**	-0.7727	0.2937
NOFFSC	0.0101	0.4939	0.0085	0.5097
NU	0.0007	0.9840	0.3329	0.0000***
OAO	0.3563	0.0264**	0.2914	0.1506
DNS	0.0912	0.6910	0.2529	0.0560*
*LnGP*GLO or LnGP*DOM*	0.2118	0.0745*	-0.3123	0.0207**
*ME*GLO or ME*DOM*	-0.0004	0.0000***	0.0005	0.0000***
*STD3*GLO or STD3*DOM*	-15.4573	0.0899*	7.5059	0.3665
*OFFSIZE*GLO* or *OFFSIZE*DOM*	-1.5892	0.0350**	1.4978	0.0568*
*NOFFSC*GLO* or *NOFFSC*DOM*	-0.0065	0.7186	0.0005	0.9796
*NU*GLO* or *NU*DOM*	0.3304	0.0000**	-0.3323	0.0000***
*OAO*GLO* or *OAO*DOM*	-0.1647	0.5138	0.0701	0.7793
*DNS*GLO* or *DNS*DOM*	0.1363	0.5875	-0.1950	0.4428
Adjusted R-squared	0.474		0.470	
Prob. (F-statistic)	0.000		0.000	