

Common Stock Returns and International Listing Announcements: Conditional Tests of the Mild Segmentation Hypothesis

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ABSTRACT

Recent theoretical work on mild segmentation suggests that tests of dual listing should be conducted as joint tests: a) a test of changes in market integration that may affect asset returns through investors portfolio reallocations as the choice set changes, and b) a test of changing risk premium/information effects. Previous empirical studies on common stocks have been unable to identify significant positive abnormal returns associated with international listing. However, such studies have not formally tested for changes in market integration through time. In addition, they have not examined announcement dates, which should be the focal point in testing for valuation effects. Unlike previous studies, our analysis concentrates on both the period surrounding the earliest public announcements by Canadian companies of their intentions to seek a U.S. listing for their common shares on the NYSE, AMEX, or NASDAQ as well as the date of U.S. listing during the period 1985-96. This period encompasses significant changes in the regulatory environment which might be perceived to enhance the integration of the two markets. Relying on a conditional asset pricing model subject to time-varying volatility, the results of this study fail to support the view that market integration has increased between the Canadian and U.S. stock markets over the 1985-96 period. The significantly positive announcement effects of Canadian stock listings in the U.S. stock market are consistent with the view that the two markets remain mildly segmented despite the elimination of several institutional changes that should have enhanced capital market integration between the two stock markets. Our evidence also implies that firms operating in mildly segmented capital markets can attain a lower risk premium through international stock listings.

Keywords: International stock listings, conditional market segmentation tests

JEL classification: G12, G14, G15

Note: *Journal of Banking & Finance*, 24, (2000); 471-502.

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I. Introduction

The increasing number of dual listings by foreign companies on major U.S. stock exchanges over the last ten years reflects the enhanced globalization of security markets and the dominance of the United States as the world's leading financial centre. Officials at the U.S. Securities and Exchange Commission and the U.S. stock exchanges have set objectives of attracting more foreign listings to the U.S. markets. Canadian companies represent the largest foreign contingent on the NYSE, AMEX, and NASDAQ, and they account for much of the recent growth of foreign listings on the U.S. capital market. The increasing listing of Canadian companies on the U.S. exchanges raises the question of whether this activity is consistent with shareholder wealth maximization, given that the two capital markets are generally believed to be integrated. In recent years, the stock market effects of *international listing* have been the focus of increased academic attention. Karolyi (1996) and McConnell, Dybevik, Haushalter, and Lie (1996) provide useful surveys of this literature. Karolyi (1996) cites seventeen studies on the stock market response to international listings since 1986. Surprisingly, the evidence on the valuation effects of international listing remains inconclusive.

There is a presumption in the popular financial press that listing in the U.S. should give rise to stockholder gains.¹ In their pronouncements of the rationale for listing their companies shares in the United States, senior executives of companies listed on Canada's principal stock exchange, the Toronto Stock Exchange (TSE), typically report that they expect their shareholders to benefit from listing in the U.S. Amongst the international listing benefits cited are enhanced liquidity, a broader investment base, and increased market visibility.

¹ For example, hedge fund manager Errol Rudman remarked in an interview in *Barrons*: The company [Novartis] is not registered in the U.S., which limits the ability of most U.S. investors to buy the shares. But they are applying for listing. It would require changes in their accounting. But we believe the Swiss accounting system, in many ways, is more conservative than the American system, and listing here could force Novartis to reveal extensive hidden reserves. If so, you would see a big shift in the demand for its shares, *Barrons*, August 18, 1997, p.22.

The international finance literature provides a theoretical basis for expecting shareholders to benefit from international listing. The arguments put forth hinge on the potential gains from eliminating the risk premium of trading in *segmented* markets. Errunza and Losq (1985) (EL) extend the models of Black (1974) and Stulz (1981) to the case of *mild segmentation* as a framework for empirical work. In this paradigm, portfolio inflow restrictions restrict the purchase of foreign securities by domestic investors to a subset of foreign securities, those that are in the *eligible set*. EL (1985) derive risk and return bounds for foreign stocks that are part of the ineligible set to investors, and demonstrate that such shares should command a positive super risk premium. This premium is an increasing function of the risk aversion of unrestricted investors and the market value of the restricted assets. It is expected to be lower when investors can form portfolios with eligible securities that closely mimic the ineligible securities returns. International listing can be viewed in this context as a means of eliminating this risk premium, and should be associated with an *increase* in share prices. However, much of the empirical work to date (Alexander, Eun and Janakiramanan (1988) AEJ (1988) and Foerster and Karolyi (1993) (FK)) has not been consistent with the predictions of the *mild segmentation* hypothesis, or that of the *complete segmentation* hypothesis, as in AEJ (1987).²

There are two possible interrelated explanations for the failure of previous empirical studies to document benefits associated with the listing of Canadian companies in the U.S. stock exchanges that we propose to address in this study. First, it can be argued that the results of the extant empirical literature might be reflective of an increase in market integration through time. Consistent with Basak's (1996) model, which incorporates intertemporal consumption and borrowing, the stock price effects of moving

² AEJ (1987) extend Stapleton and Subrahmanyam (1977) to the case where all foreign securities are part of the ineligible set of domestic investors. They demonstrate that under reasonable conditions (securities must be less positively correlated between countries as opposed to within countries), the event of international listing should similarly be associated with an *increase* in share prices, as in the *mild segmentation* case. Restrictions that lead to complete segmentation that they mention include institutional factors causing barriers to investment flows, accounting disclosure requirements, and problems in obtaining reliable information about the firms.

from a mildly segmented to an integrated market can be shown to be *ambiguous*. Moving from mild segmentation to integration increases demand for an asset. In this model, though, any price increases attendant to the elimination of barriers that give rise to mild segmentation may be *offset* by an increase in interest rates leading to substitution of the formerly restricted asset for bonds, due to the enhanced diversification benefits of integration. Consequently, studying the stock price effects of international listing amounts to conducting a joint test that also tests for changes in the degree of capital markets integration. In this study, we examine the valuation effects of international listing while we simultaneously account for potential time variation in the degree of segmentation between the Canadian and U.S. stock markets resulting from interlistings regulatory reforms and other forces.

A second limitation associated with previous empirical studies of international listing of common shares is that they have focused on listing dates, as opposed to the announcement dates. As Kadlec and McConnell (1994, p. 614) state: in an efficient market, the valuation effects of listing should be incorporated in the stock price at the initial announcement date. Unlike previous studies the analysis in this study examines the market's reaction around the initial public announcement date Canadian companies reveal their intentions to seek a U.S listing on the NYSE, AMEX, or NASDAQ and the actual U.S. listing date during the period 1985-96.³

Since there are basic institutional restrictions that render the *mild segmentation* paradigm suitable for examining Canadian stocks,⁴ an event study focusing on listing announcement dates can be viewed as a

³Miller (1996) is the first study of which we are aware to distinguish between the stock price impact of the announcement date vs. listing date for Depository Receipt programs, which are the second means of dual listing alluded to by MDHL (1996). The first type is the case in which the company chooses to apply for and have its shares trading in another country. This is the type of listing examined in this paper. As MDHL note, the ADR method studied by Miller is *indirect* - the owner of the ADR does not own the shares outright. Furthermore, ADRs have different degrees of disclosure requirements. ADRs that are most similar to firms examined in this study are the Level III ADRs, which have the most stringent disclosure requirements. Millers sample pools 30 such issues from both developed and emerging markets. Canadian firms do not trade as ADRs in the United States.

⁴Stocks traded on the Toronto Stock Exchange are not exempt from U.S. state registration requirements; thus, U.S. brokers and investors are constrained in their investment choices in Canada. If they wish to have exposure to Canadian markets, they are

direct test of the *mild segmentation* hypothesis. This approach is consistent with Solnik's (1977, p. 505) recommendation of efficiently testing for market segmentation ("to specify the type of imperfection which might create it and study its specific impact on portfolio optimality and asset pricing").

The period examined in this study encompasses significant changes in the regulatory environment, including the introduction of the Multi-Jurisdictional Disclosure System (MJDS) in July 1991, which relaxed the financial reporting requirements for Canadian companies listing in the United States, the amendments to MJDS in July 1993, as well as changes in disclosure requirements for Canadian companies listed on the domestic market mandated by Canadian securities regulators in October 1993.⁵ In the context of the *mild segmentation* models of EL (1985) and Basak (1996), one could argue that these changes serve to increase market integration. To the extent that foreign investors can more easily *mimic* the returns of firms in the *ineligible set*, the beneficial impact to the firm of listing in the U.S. might be hypothesized to diminish through time. Hence it seems essential to conduct tests of international listing effects as joint tests that include a) a test of changes in market integration that may affect asset returns through investors portfolio reallocations as their choice set changes, and b) a test of valuation changes due to changing risk

restricted to investing in those stocks that are interlisted on U.S. exchanges. One might mention that U.S. investors could purchase non interlisted Canadian stocks indirectly - through an offshore account (e.g. in a Cayman Islands or a Bahamian company). The strict residence restriction that delimits U.S. investors from holding Canadian firms solely listed on the TSE also holds for exchange created index portfolios, such as the TIPS, which is a popular basket portfolio created by the TSE on the 35 companies in the TSE index in March 1990. The SEC does not permit ownership of the TIPS by U.S. residents, even though 24 of the 35 companies that comprise this basket are actually listed on the New York Stock Exchange.. Other important barriers to market integration include: Canada's preferential tax treatment of dividends received by residents from domestic corporations (Booth and Johnson (1984)) and the limits that Canadian pension funds are permitted to invest in foreign assets - in 1994, the limit was raised to 20% of the book asset value of the funds assets. See R. Schiele, Changes in Rules Sharply Boosts Funds Foreign Content, *Financial Post* June 2, 1994, p. 18. It should be mentioned that the 20% limit can be circumvented by investing in foreign currency denominated assets issued by Canadian based companies. Previous studies looking at market integration between Canada and the U.S. include Jorion and Schwartz (1986) and Mittoo (1992). Both of these studies show some evidence of a *nationalistic premium* in the pricing of Canadian assets traded in the domestic market vs. those that are traded in the U.S. These studies do not account for potential time variation in the degree of segmentation at the market (firm) level resulting from interlistings, regulatory reforms, etc. See Bekaert and Harvey (1995).

⁵The latter changes tightened Canadian disclosure standards in the sensitive area of executive compensation, and as a consequence, harmonized Canadian financial reporting standards with those prevailing in the United States. As I will show, since this change in the legislative environment, there has been an increased pace of U.S. listings by Canadian companies. There have been new listings by major Canadian banks, who had in the past expressed strong reservations about listing in the U.S. and chose London over New York as a place to list their shares internationally. See e.g. *Euromoney*, May 1984, p. 107.

premium/information effects at the announcement date. The approach of Bekaert and Harvey (1995) is used to account for the effects of time-varying market integration changes.

Based on a conditional model of returns of the national market indexes subject to time-varying volatility, our findings fail to show increases in integration between the Canadian and U.S. stock markets over the 1985-1996 period. Consistent with the mild segmentation hypothesis, a positive and significant market reaction on the firm's earliest announcement to listing in the U.S. is documented. This evidence is also consistent with informational and market liquidity enhancement effects.⁶

The remainder of the paper is organized as follows. The next section provides a brief description of some of the costs associated with the listing of Canadian shares in the U.S.. The changes in the regulatory environment in the period under investigation and the time-varying relationship between US and Canadian stock markets are modelled in section III. Section IV describes the sources of data, methodology and presents the international listing effects. In section V, the announcement effects of Canadian companies listing their common shares in the United States are presented and discussed. The paper concludes with a summary in section VI.

II. The Costs of Listing for Canadian Corporations in the U.S.

A. Listing Standards and Direct Costs of Listing/Trading on the Various Exchanges

From the listing standards of the exchanges, it is clear that a mainstream tier one industrial firm on the TSE, (one exempt from section 19.09 of the exchange by-laws) in Canada would generally have no

⁶On the issue of informational benefits to international listing, Cheung and Lee (1995) show that as a consequence of the severe sanctions at the disposition of the U.S. Securities and Exchange Commission (which regularly investigates reporting violations by listed companies in the U.S.), one might expect that only high quality firms will be willing to list their shares in the United States. International listing in this framework is a signal to the market that the firm is of superior character. As a consequence, the firm should be expected to profit from a share price appreciation on the event of U.S. listing. The rationale of a broader investment base and liquidity benefits has also been put forth by Kadlec and McConnell (1994) (KM) who extend support to Merton's (1987) investor recognition factor as well as Amihud and Mendelson's (1986) liquidity factor to switching the listing of shares in the U.S. from NASDAQ to the NYSE.

difficulties meeting the basic financial standards of the NASDAQ National Market and the AMEX.⁷ Since NASDAQ and AMEX listing costs and financial standards are not greatly different from those of the TSE, it is not surprising that a number of Canadian firms have chosen to list on these exchanges and bypass the TSE altogether.⁸

B. Disclosure Costs Across Exchanges and Changes in the Disclosure Environment

Trading costs and listing fees have not been the only deterrents to listing Canadian companies shares in the United States. In addition, there are the costs of corporate disclosure, which involve complying with state registration requirements, the guidelines of the exchanges, as well as the requirements of Securities and Exchange Commission Act of 1934.⁹ In the past, the substantial costs to bring a foreign firm into compliance with U.S. requirements have been a deterrent to listing foreign securities in the United States. However, in recent years, some of these costs have declined as a result of the introduction of the Multi-jurisdictional Disclosure System (MJDS) on July 1, 1991.¹⁰

⁷The current exchange fee schedule as well as the financial criteria for listing on the NYSE, AMEX and NASDAQ are available from the author on request. The typical profile of a firm based in Canada with an AMEX listing is a small to medium size industrial or oil or mineral company. NASDAQ includes similar companies as well as many of Canada's leading high-tech firms. The standards and costs of the NYSE are substantially higher than those of the TSE, AMEX, and NASDAQ. With few exceptions, the NYSE is the venue for major blue-chip Canadian stocks, and accounts for more than half of the value of trading in such stocks as Northern Telecom and Seagrams. There are no Canadian based issues that trade on the NYSE that are not also listed on the TSE. See *Toronto Stock Exchange Review*, Dec. 1996.

⁸ Examples include: Arakis Energy Co., Big Rock Brewery, Discreet Logic, Inc., Dynamex, Inc. Optimal Robotics Co., Sutton Resources, Visible Genetics, and Zoom Telephonics Inc., which are Canadian based companies listed on the NASDAQ National Market, but not on the TSE; ARC International, CEC Resources, G.S.T. Telecommunications, and North Amercian Vaccine, Inc. are examples of Canadian based companies listed on the AMEX, but not the TSE.

⁹ In a survey of senior executives of all TSE firms that interlisted on the NYSE or AMEX in the period 1975-83 Switzer (1986) found that the incremental legal and accounting required for compliance with U.S. registration requirements are in excess of \$400,000 per year. Saudagaran and Biddle (1995) provide evidence that disclosure costs affect the choice of foreign stock market that a company will list its securities and that companies are reluctant to move to higher disclosure environments.

¹⁰ In 1982, the SEC introduced the Integrated Disclosure System (IDS) which permitted foreign firms to prepare their financial statements using foreign as opposed to U.S. GAAP under restrictive circumstances. Under the IDS, foreign firms were still required to comply with U.S. auditing standards, and must complete a 20-F form whose content is essentially the same as the U.S. 10-K form. This legislation was deemed to be the first step to a borderless North American capital market and acknowledges the compatibility of accounting rules between Canada and the United States. MJDS allows firms in each country to list securities in each others markets subject to the home country disclosure requirements, though Canadian issuers are required in addition to reconcile their financial statements subject to U.S. GAAP.

Under the MJDS, the SEC is empowered to approve the financial statements of *qualified* Canadian companies based on forms sanctioned by Canadian regulators, without added SEC review. On July 1, 1993, the MJDS was amended to relax the qualifications for Canadian companies that fall under its purview,¹¹ but maintained the U.S. GAAP reconciliation requirements.¹² Critics of the MJDS suggested that it would do little to encourage Canadian listings on U.S. exchanges.¹³ A key issue of contention was the lack of required disclosure of executive compensation for companies traded in Canada, as opposed to the United States. When Canadian regulators in October 1993 mandated that all companies with issues traded on the TSE or on the local over-the-counter market (The Canadian Dealing Network) disclose the compensation of senior officers and all directors of such corporations, this issue became moot.¹⁴

III. Changes in the Regulatory Environment and the Time Varying Relationship Between U.S. and Canadian Stock Returns

A. Modeling the Time-Varying Linkages Between Markets

It could be argued that an increase in market integration through time as a result of these regulatory changes will distort the significance of the interlisting event. In particular, one might hypothesize

¹¹ In particular, the requirement of a \$860 million market capitalization was abolished, and the operating history for Canadian companies wishing to list securities in the U.S. was lowered from 36 months to 12 months. Finally, qualifying Canadian companies are, under the new rules, required to have a public float of \$75 million U.S. as opposed to \$75 million Canadian. See R. S. Carmel, New Initiatives for Foreign Issuers, *New York Law Journal*, Dec. 16, 1993, p. 3.

¹² See *International Financial Law Review*, October 1994, pp. 14-18.

¹³ Amongst the reservations mentioned include: a) the high costs of GAAP reconciliation; b) the ability of Canadian companies to easily meet their financing needs at home through *bought deals* furnished by an aggressive domestic investment banking industry; c) the ability to raise capital in the U.S. via off exchange 144A as well as Regulation S offerings that are exempt from continued reporting requirements in the U.S.; and d) the perceptions of a more litigious U.S. environment coupled with the lack of relief from U.S. civil liability and anti-fraud provisions which undercuts the single jurisdictional principle. See R. S. Carmel, *ibid*.

¹⁴ The new rules passed by the Ontario government require that listed companies disclose the compensation of the chief executive, the four next highest paid officers, and all directors. Required data that must be disclosed include all salaries, bonuses, stock options, club memberships, and educational provisions for the recipients children, non-routine loans, guarantees, as well as golden parachutes involving sums in excess of \$100,000 Canadian. See *International Securities Regulation Report*, Nov. 2, 1993. This harmonization has apparently led to an increase in Canadian listings in the United States. Indeed, 36 of the 53 Canadian companies listed on the NYSE as of December 1996 represent new listings (including IPOs) since October 1993.

that the shareholder wealth effects of interlisting should diminish as markets become more integrated while investors may be better placed to use existing securities to mimic the returns in the ineligible set of securities (EL (1985), Basak (1996)). However, before making such an assertion it is meaningful to *formally validate* whether or not there is an increase in the degree of time-varying integration between the two markets.

One way of testing whether there is evidence of increased integration between Canadian and U.S. markets is to specify a return generating model that captures the extent to which the conditionally expected Canadian market return is affected by its own variance as well as with its covariance with U.S. returns, using the approach proposed by Chan, Karolyi, and Stulz (1992) (CKS). This approach can be further modified to allow for country specific information to affect the regime probabilities (in order to capture time variation in market integration), as in Bekaert and Harvey (1995). An alternative approach that they propose (p.437) as an extension is to let the regime variables be functions of indicator variables to capture regulatory policy changes. In this section, we will implement this latter approach for Canadian and U.S. market indices.¹⁵

Following Chan, Karolyi and Stulz (1992), excess returns for Canadian and U.S. stocks are first modeled as a bivariate system:

$$r_{TSE,t} = \mathbf{a}_{00} + \mathbf{b}_0 \mathbf{w}_{TSE,t} h_{TSE,t} + \mathbf{b}_{01} (1 - \mathbf{w}_{TSE,t}) h_{TSE-US,t} + \mathbf{e}_{TSE,t} \quad (1)$$

$$r_{US,t} = \mathbf{a}_{10} + \mathbf{b}_1 \mathbf{w}_{US,t} h_{US,t} + \mathbf{b}_{11} (1 - \mathbf{w}_{US,t}) h_{TSE-US,t} + \mathbf{e}_{US,t} \quad (2)$$

where $r_{TSE,t}$ and $r_{US,t}$ are excess returns to Canadian and U.S. stocks (returns in excess of the risk free rate), $\mathbf{w}_{TSE,t}$ is capitalization of the Canadian market divided by the total capitalization of the combined U.S. and Canadian market, $\mathbf{w}_{US,t}$ is the corresponding market capitalization share for the U.S. market,

¹⁵ As noted in Bekaert and Harvey, (1995p.436-7), focusing on returns data may imperfectly capture the degree of integration due to differences in industry mix across countries. In addition, there may be other sources of risk, including time-varying foreign exchange

$h_{TSE,t}$ is the conditional variance of Canadian market returns, $h_{US,t}$ is the conditional variance of U.S. returns, and $h_{TSE-US,t}$ is the conditional covariance of U.S. and Canadian stock returns. As in CKS and BH, the conditional variance dynamics are modeled as an ARCH process, using the Baba, Engle, Kraft and Kroner(1989) (BEKK) specification for the residuals:

$$\mathbf{g}_t \sim N(0, H_t),$$

$$(3) \quad H_t = \begin{bmatrix} h_{TSE,t} & h_{TSE-US,t} \\ h_{TSE-US,t} & h_{US,t} \end{bmatrix}$$

$$= Q'Q + G'H_tG +$$

$$C'g_t g_t' C \quad (4)$$

where H is the 2×2 covariance matrix conditional on information at time $t-1$, \mathbf{g}_t is the vector of residuals in (1), G and C are matrices of coefficients, and Q is an upper triangular matrix of coefficients. In order to capture the effects of a change in the regulatory environment that may be expected to alter the degree of capital market integration, following the BH (1995, p.437) equations (1) and (2) are rewritten to incorporate the indicator variable D_t as:

$$r_{TSE,t} = \mathbf{a}_{00} + (\mathbf{b}_0 + \mathbf{I}_{00}D_t)\mathbf{w}_{TSE,t}h_{TSE,t} + (\mathbf{b}_{01} + \mathbf{I}_{01}D_t)(1 - \mathbf{w}_{TSE,t})h_{TSE-US,t} + \mathbf{e}_{TSE,t} \quad (1\mathbb{N})$$

$$r_{US,t} = \mathbf{a}_{11} + (\mathbf{b}_1 + \mathbf{I}_{10}D_t)\mathbf{w}_{US,t}h_{US,t} + (\mathbf{b}_{11} + \mathbf{I}_{11}D_t)(1 - \mathbf{w}_{US,t})h_{TSE-US,t} + \mathbf{e}_{US,t} \quad (2')$$

where D_t an indicator variable which is set equal to 1 subsequent to the regulatory change and equal to 0 otherwise. In this model, regulatory environment changes will be associated with increased (decreased)

risk (Doukas, Hall and Lang (1999)), value vs. glamour effects, and size effects between the two countries (Doukas and Switzer (1999)).

integration of the Canadian market with the U.S. market to the extent that the estimated coefficient I_{01} is found to be significantly positive (negative)

B. Data Sources

The Canadian Index used is the daily closing value of the principal Canadian benchmark index, the Toronto Stock Exchange 300 Index (TSE 300).¹⁶ The U.S. index used in the study is the daily closing value of the Standard and Poors 500 index obtained from the CRSP data base and from the *Wall Street Journal*. The TSE 300 Index, as well as the exchange rates for calculating U.S. dollar returns are collected from the TSE/Western and Bloomberg data bases. The daily rate for three-month U.S. Treasury bills is used as a proxy for the U.S. risk free rate, and is collected from the Wall Street Journal. The daily rate for three-month Canadian Treasury bills is used as the Canadian risk free rate, and is obtained from the Bank of Canada and from CANSIM. Market capitalization data for Canada and the U.S. were obtained from Morgan Stanley Capital International.

Unlike CKS, who use quarterly market capitalization data, this study uses monthly series. The observations within the month are interpolated dynamically using the returns of the indices. Extending the interpolations from the end of the month to the beginning of the next month show that the computed weights closely correspond to the actual weights reported by Morgan Stanley. The sample period for the analysis extends from January 3, 1977 (the date of introduction of the TSE 300 Index) until July 31, 1997. To account for potential distortions associated with the stock market crash of October 1987, both the entire sample period is examined as well as a sample period that excludes the four days surrounding the stock market crash of 1987 (October 16, 19, 20 and 21). Since none of the inferences are affected by the

¹⁶ The TSE 300 is a value-weighted portfolio of 300 stocks from 14 industry groups, introduced in January 1977 (with a base set to 1000 in 1975). To be eligible for inclusion in the TSE 300, the company must be incorporated in Canada, and be continuously listed on the Toronto Stock Exchange for a period of at least one year - exceptions are made for companies that have been listed for as little as six months, when the float market capitalization of the firm places it among the top 150 of all TSE listed firms. Control blocks of over 20% of the company's capitalization are removed in the calculation of the float market capitalization.

exclusion of these crash dates, while the statistical properties of the truncated data base are problematic, the results reported will be for the entire sample period.¹⁷

Table I provides some summary statistics of the excess return series. The Jarque-Bera statistics in Panel A evince non-normality for all of the series. In Panels B and C, the autocorrelations of the excess return and squared excess returns are presented. The relatively high first order autocorrelation for the TSE 300 series (equal to .231 when the returns are measured in Canadian dollar as well as U.S. dollar terms) relative to the S&P 500 (.039) is symptomatic of nonsynchronous trading effects caused by smaller firms in the Canadian series. These high autocorrelations as well as the large autocorrelations of the squared excess returns provide support for the GARCH processes in examining the interactions between the markets. Panels D and E, present the cross-correlations between the excess return series as well as of the squared excess return series. One might suggest that the relatively high contemporaneous correlations between the Canadian and U.S. series indicates that the markets are indeed integrated, but as BH (1995, 436) note, such an inference may be flawed: high (low) correlations may be consistent with segmentation (integration) and may simply reflect the similar (different) industry mixes that characterize the different national indices. Since the trading hours of the exchanges are synchronized, the significant leading correlations from U.S. markets to Canadian markets may be further related to the nonsynchronous trading effects in the TSE found in the Canadian autocorrelation series. Overall, the high correlations of the return and squared return series are supportive of the processes embodied in the bivariate models above.

[Insert Table I About Here]

C. Integration Tests of Canadian and U.S. Capital Markets

Plots of the conditional covariance term, $h_{TSE-US,t}$, and conditional variance term, $h_{TSE,t}$, from the

¹⁷ The results for the analyses that exclude Oct. 16, 19, 21, and 22, 1987 are available on request.

estimation of regressions (1) and (2), as shown in panels A and B in Figure 1, delineate no apparent trend, when returns are measured in Canadian or U.S. dollars. In the analysis that follows, it is assumed that a regime shift occurred on July 1, 1991, with the formal inauguration of the MJDS. Thus, in the estimation of regressions (1') and (2') the indicator variable, d_t , is assigned a value of one subsequent to this date. It seems reasonable to conjecture that the MJDS, as well as the subsequent changes in disclosure requirements imposed by Canadian and U.S. regulators, are integration enhancing changes. This conjecture, of course, will be supported if the estimated coefficient λ_{01} is found to be significantly positive.

[Insert Figure 1 About Here]

Table II shows the estimation results. The likelihood ratio statistics for the Canadian returns model as well as the U.S. returns model provide evidence in favor of a regime shift after July 1, 1991. In both cases, the P^2 values (90.1916 and 69.5334) exceed the critical value at the one percent level (13.28). However, in neither case, is there evidence of a change in the risk premium to covariance risk, since I_{01} is not significant. Although these results support time-varying return generating models for the U.S. and Canada, they do not support the hypothesis that the markets have become increasingly integrated through time in a manner that would vitiate an event study, particularly one that includes firms listing in the U.S. subsequent to the introduction of the MJDS.

[Insert Table II About Here]

IV. International Listing Effects

A. Previous Empirical Work

Despite the claims by firms about the shareholder benefits of international listing in the United States, as well as the analytical arguments that have been put forth to support such claims, the empirical

evidence to date has been mixed, at best.¹⁸ Using daily data for the 27 Canadian companies that had listed in the U.S. (on the AMEX (10 companies) and the NYSE(17 companies)) during the period 1962-83, Switzer (1986) found abnormal returns of approximately 20 percent, on an annualized basis, during the period around the interlisting date, but no significant returns on the actual listing date itself. AEJ (1988), however, focused on the month of actual listing and therefore used monthly data to examine the impact of listing for 34 foreign stocks in the U.S. during the 1969-82 period (13 of which were Canadian). For the sample as a whole, they find some positive prelisting abnormal returns, but no significant effects on the listing month. Furthermore, they find significantly negative post listing returns, which are less severe for the Canadian subsample. More recently, FK (1993) also looked at actual listing dates for 53 TSE stocks that interlisted on the NYSE (6 companies) AMEX (7 companies) or NASDAQ (38 companies) during the period 1981-90. They found annualized excess returns of over 23% for the 100 days before listing and negative post listing performance, as in AEJ (1988) and consistent with the post-listing anomaly first identified by McConnell and Sanger (1987) for stocks first listing on the NYSE.

Previous studies find no significant returns on the actual listing days.¹⁹ These results could be indicative of the consumption smoothing effects postulated by Basak (1996). Alternatively, to the extent that markets anticipate the listing, the lack of significance around the listing dates found by Switzer (1986), AEJ (1988), and FK (1993) might not be incompatible with a model of partial segmentation with no

¹⁸ The focus here is on Canadian firms listing on U.S. exchanges. Several studies have examined the issue of listing by U.S. companies abroad (to regimes with more lenient disclosure standards) with inconsistent results. To name a few, Howe and Keim (1987) show that overseas listing by U.S. companies is detrimental to shareholder wealth. Similarly, Varela and Lee (1993) show negative listing effects. Fry, Lee and Choi (1994) show negligible effects.

¹⁹ A recent study that shows significant abnormal returns for ADR issues in the U.S. on the actual listing day is that of Jayaraman, Shastri, and Tandon (1993). They examine 93 ADRs that listed on a U.S. stock exchange (from Japan, U.K, Australia, France, Germany, Italy, and Sweden) during the period 1983-88, and show a significant .47% abnormal return on day 0. However, on day 1, the abnormal return for the sample is -.47%. Foerster and Karolyi (1996) expand this sample to 151 ADRs 1976-92, use weekly data and find positive abnormal returns. In contrast to Jayaraman, Shastri, and Tandon (1993), Miller(1996) finds no significant abnormal returns immediately around the actual *listing day* for an ADR. For his sample of 30 Level III issues, which are the most comparable in terms of disclosure to the firms in this sample finds positive and significant *announcement day effects*. Some of these effects may be the result of large market segmentation premia from the emerging market segment of the sample (only 14 of the Level III issues examined by Miller are from developed markets), and may not be generalizable to countries with dissimilar degrees of segmentation.

sizeable bond market offsets, as well as executive pronouncements about the wealth benefits of international listings. FK (1993, p. 775) use a three day window, and surmise that listing dates actually coincide (or are very close to) the announcement of interlisting. As will be shown, for the majority of Canadian listings in the U.S. between 1985 and 1996, the announcement dates differ substantially from the actual listing dates.²⁰ Whether this discrepancy has a marked effect on the estimation of the abnormal returns to international listing will be examined subsequently.

B. A Description of the Data

Canadian companies currently represent the largest foreign contingent on the NYSE, AMEX, as well as NASDAQ. The firms examined in this study consist of TSE companies newly listing on the major U.S. stock exchanges (NYSE, AMEX, and NASDAQ - but not on the NASDAQ Small-Cap market, and not on the OTC Bulletin Board) over the 1985-96 period. Companies that were listed as a consequence of changes in the structure of existing Canadian companies already trading on the NYSE were not included in the analysis.²¹ IPOs and companies that were listed on U.S. exchanges prior to their listing on the TSE were also excluded. We also omit companies that have been listed on a U.S. exchange as a consequence of being delisted from a more senior exchange, such as MacMillan Bloedel which began its NASDAQ trading in 1986 after being delisted from the NYSE. Stock return data series are required for 120 trading days before and 60 days after two events. The events are a) actual listing, and b) the first public announcement by the firm of its intention to list. Of the 269 Canadian companies with U.S. listings over this period, 79 are identified that satisfy the criteria for inclusion in the final analysis and are by exchange of listing distributed as: 25 NYSE, 14 AMEX, and 40 NASDAQ. At the end of 1996, the market

²⁰ For the period of the sample that overlaps with FK (1993), the discrepancy is on average 13 days, though in one case, the announcement occurred 50 days prior to the trading date.

²¹ For example, the listing of Placer Dome which was the result of the merger between Dome Mines and Placer Resources, both of which had separate NYSE listings prior to the merger is excluded. Similarly, Stampeder Exploration is not included, since its listing is a consequence of the takeover of Morgan. Trizec-Hahn Corporation, formerly Horsham is not included for similar reasons.

capitalization of the companies in this sample was \$127.563 billion (based on year end share prices and shares outstanding), which represents 19.13% of the capitalization of *all Canadian-based* companies listed on the TSE. Based on the 1996 year-end exchange rate between the Canadian dollar and U.S. dollar (\$1.3690 Canadian per \$1.00 U.S.), the capitalization of these companies represents approximately 20.69% of the market value of *all foreign listings* on the NYSE, 8.7% of the market capitalization of *all foreign listings* on AMEX, and 15.91% of *all foreign listings* on NASDAQ at the end of 1996. The data suggest that the rate of U.S. listings by Canadian companies has increased dramatically in recent years. Approximately 82.2% of the firms in this sample listed their shares in the period after the adoption of the MJDS by U.S. and Canadian market regulations in 1991.

For the analysis of the *announcement effects*, we identified for each firm the earliest public announcement of its intention to seek a U.S. listing from Lexis-Nexis. Actual U.S. listing dates were obtained from the exchanges. A focused search of all company news, including registration applications, for up to five years prior to the U.S. exchange listing was performed using Lexis-Nexis in order to identify the announcements. For 49 out of the 79 cases, the announcement date precedes the listing date. The average lead time for the announcements in this sample is 38 days, which is slightly longer than half of the period of time expected to elapse between the time of submission for confidential review of eligibility for listing to actual listing by a typical firm, according to the NYSE.²²

C. Hypotheses Tested

This study tests several hypotheses. The first hypothesis is that the decision by Canadian companies to list their shares in the U.S. over the past decade is consistent with maximization of

²²According to the NYSE, a typical corporation should expect that this period should extend about 8 weeks. See *NYSE, Listing Standards and Procedures for Foreign Corporations*, 1996, p. 9. FK (1993, p. 775) state: conversations with stock exchange officials suggest that the listing dates actually coincide (or are very close to) the announcement of interlisting. This is clearly not the case for this sample.

shareholder wealth. To the extent that partial segmentation characterizes these markets, stock prices may be expected to rise on the announcement of a firm's decision to list its shares in the U.S. Of course, liquidity benefits (as in KM (1994)), as well as propitious signalling effects (as in Cheung and Lee (1995)) may also play some role. As discussed by AEJ (1988), a survivorship or selection bias could be a problem: firms that list in the U.S. may have a recent history of strong performance. If that is the case, an increase in the probability of Type I error may occur in the analysis, due to an overstatement of expected returns from the estimation period. Since the abnormal returns in this study are determined net of market returns, and the benchmark market index also contains an upward survivorship/performance bias, the comparisons may not be problematic. To ascertain the significance of this bias, similar to AEJ (1988), we test whether or not the estimated alpha in a market model regression of excess firm returns, defined as returns in excess of the risk free rate, on excess market returns is significantly greater than zero for the firms in this sample over the estimation period.²³

Market efficiency dictates that the beneficial effect of listing should be imparted to the markets largely when the information about listing is first available to the markets. In particular, at the first public announcement of the firm's intention to list its shares.²⁴ Previous studies of ordinary common shares have assumed that the announcement date is the same as the listing date. Since this is not the case for many firms in this sample, we may be able to explain why many of these studies were unable to detect the benefits associated with international listing. That is, the market's response to the news of the listing, as opposed to the listing itself.

²³ Fama and French (1996) assert that survivorship bias may be exaggerated to the extent that well performing firms do not list because their capital requirements are low and/or the success of their projects eliminates the need for external financing.

²⁴ As Kadlec and McConnell (1994, p. 614) state: in an efficient market, the valuation effects of listing should be incorporated in the stock price at the initial announcement date.

The second hypothesis to be tested is based on the view that there should be differential effects to international listing, depending on the U.S. exchange that the firm lists its shares. In particular, it is ventured that a greater positive response to the announcement to list should be expected for firms listing on the NYSE, given the more stringent standards, disclosure requirements and higher costs for firms on the NYSE as opposed to AMEX and NASDAQ. A larger response for firms moving to the NYSE rather than to the NASDAQ would be consistent with Eleswarapu's (1997) finding of a liquidity premium for shares listed on NASDAQ, as opposed to the absence of such a premium on the NYSE, shown by Eleswarapu and Reinganum (1993). NYSE may similarly provide better liquidity, as well as greater advantages in terms of visibility and prestige than AMEX.²⁵

Consistent with Merton (1987) and KM (1994), our third hypothesis to be tested relies on the view that the benefits to international listing should be dependent on enhanced investor recognition. According to this hypothesis, listing in the U.S. tends to expand the firm's *investment base* and, in turn, lower its cost of capital and give rise to an increase in its share price. In this study, this hypothesis is refined to state that the share price benefits from international listing will obtain when trading of the shares successfully moves to the U.S. exchange. That is, if trading occurs overwhelmingly on the local market after foreign listing, fewer benefits will be realized. Therefore, we use the percentage of the value of the firm's shares that trade on the U.S. exchange, as opposed to the Canadian exchange over the year subsequent to listing as a proxy to the change in the *investor base* consequent to listing in the United States.²⁶

²⁵ Baker and Edelman (1992) show that firms stock market prices rise significantly on the day of announcement that the firms switch from AMEX to NYSE. Subsequent to the announcement, though, they provide evidence of adverse performance, that depends on the firms share transaction volume.

²⁶ If the trading on U.S. markets is at the expense of reduced trading in the local market, with the same Canadian shareholders purchasing their shares in the U.S. as opposed to Canada, this variable might not capture enhanced investor recognition, but rather some other effects, such as a change in relative trading costs. However, there is no evidence of constant or declining trading activity for these firms in the year subsequent to U.S. listing. On the contrary, total trading volume increases on average by 12.7% for these firms. It is of course difficult to obtain information on the identity of shareholders purchasing interlisted stocks in Canada vs. the U.S. I have conducted a survey of Canadian pension funds, (including Canada's largest which has over \$60 billion under management) to determine the extent of trading that migrates to the U.S. as a consequence of U.S. listing. In all cases, the Canadian pension funds

The final hypothesis that is tested is whether the degree of segmentation between the Canadian and U.S capital markets has declined since July 1991 as a result of the introduction of the MJDS, the modification of MJDS in 1993, and the subsequent changes in disclosure requirements on the TSE in 1993. That is, it is expected that the incremental abnormal returns associated with listing should decline for individual firms since any super-risk premium associated with partial segmentation would be smaller in magnitude. A rejection of this hypothesis would corroborate our previous results which fail to provide evidence of increased integration based on the national market indexes.

D. Estimation of Abnormal Returns

To assess the market's response of the U.S. listing events, as well as the announcement of the firm's decision to list, the standard market model as discussed in Brown and Warner (1985) is employed. Prabhala (1997) demonstrates that the traditional event study-approach generally performs well in a wide range of circumstances. It is a well-specified procedure for detecting the existence of informational effects, and in the absence of a sample of firms that can be expected to make announcements when the firm does, will generate valid inferences relative to a conditional model, in cross-sectional regressions to identify the factors explaining the abnormal returns.²⁷ In contrast with AEJ(1988) who use monthly data, and Kadlec and McConnell (1994) who employ weekly data, this study, like FK (1993) examines returns on a daily basis. As Fama (1991, p.1607) notes, "The cleanest evidence on market-efficiency comes from event studies, especially event studies on daily returns. When an information event can be dated precisely and the event has a large effect on prices, the way one abstracts from expected returns to measure abnormal daily returns is a second-order consideration." Unlike FK (1993), in this study we look at both

surveyed conduct *all* of their trading in Canadian interlisted issues on the TSE and not on the U.S. markets. Hence, it does not seem unreasonable to suggest that *new U.S. investors* are purchasing these interlisted shares on the U.S. markets, and USTRAD does indeed capture an expansion of the shareholder base.

²⁷ Prabhala (1997) shows that in the absence of non-event data, conditional methods offer little value relative to "traditional procedures" (p.3). Thus, in the cross-sectional regressions, we assume that the announcement of U.S. listing is an unprecedented, and *unanticipated* event unique to each firm, which does not seem unreasonable.

announcement dates as well as actual listing dates. We have also estimated the abnormal returns allowing for potential shifts in the market model parameter β_i in the event period. This procedure accounts for the possibility that integration increases due to the listing itself and, therefore, may impact on the risk of the listed security.

To test for announcement and listing effects, as well as market specific announcement and listing effects (hypotheses one and two), the event analysis is conducted for the complete sample and for the firms grouped by exchange of listing. Hypotheses three and four are examined in cross-sectional regressions of the market model abnormal returns on the firm specific variables. The variables used in the analysis include the USTRAD, defined as the percentage of the value of the firm's shares that are traded in the U.S. market as opposed to all Canadian markets²⁸ over the year subsequent to listing to test the investor recognition hypothesis, the MJDS, a dummy variable equal to 1 for firms that list in the U.S. after July 1, 1991 and 0 otherwise. This variable is expected to capture the effects of the of the Multi-Jurisdictional Disclosure System in integrating the markets since 1991, which would reduce the super risk premium in Canadian stock returns. A potentially offsetting factor is the lower relative costs of disclosure since the introduction of the MJDS, which may enhance the returns to such companies listing in the U.S.

In addition to these variables, we also control for other factors that may affect stock return performance around the time of the announcement to list in the United States. Fama and French (1992) demonstrate that these two factors (size and book-to-market equity) appear to describe well the cross-section of average stock returns in the United States. These include the firm size, SIZE, proxied by the natural logarithm of the value of the firm's market equity at the end of the fiscal year prior to the date of

²⁸ This figure represents trading across all Canadian exchanges divided by trading on the U.S. exchange. During the sample period, some of the firms were interlisted on both the TSE, the Montreal Stock Exchange, as well as the Vancouver exchange. Well over 85% of the domestic (as opposed to U.S.) trading of Canadian based stocks that are interlisted on a U.S. exchange occurs on the Toronto

the listing (price per share times the number of shares outstanding), and the natural log of the firm's book-to-market equity ratio, BTM, where the numerator is calculated as the book value of the firms common equity plus deferred taxes in the fiscal year prior to listing in the U.S. and the denominator is the value of the firm's market equity at the end of the fiscal year prior to the time of the listing (price per share times the number of shares outstanding). Fama and French (1992), Arshanapalli, Coggin and Doukas (1998) demonstrate that size and book-to-market factors appear to describe well the cross-section of average stock returns in the United States and other countries including Canada, respectively.

Finally, since all of these companies either explicitly report sales in the U.S. or operate in export markets where prices are denominated in U.S. dollars,²⁹ to control for the firm's exchange rate exposure, the exchange rate, EXCHR, defined as the Canada dollars per US currency unit, at the time of the listing announcement is included.

One might conjecture that the benefits to accessing the U.S. market are greater when the price of the U.S. currency is high, relative to the Canadian currency. Since the firm's sales to the U.S. may be more competitive under such circumstances, it may be better positioned to access U.S. capital markets. Under such circumstances, the benefits to listing in the U.S. may be enhanced.

In sum, the expected relationships between the abnormal returns for company *i* around the U.S. listing period *k*, AR_{ik} , and the cumulative abnormal returns over the interval *dt* to listing in the U.S., $CAAR_{idt}$, and the firm specific variables are as follows:

$$AR_{ik} = f(\overset{+}{USTRAD}, \overset{-}{MJDS}, \overset{-}{SIZE}, \overset{+}{BTM}, \overset{+}{EXCHR}) \quad (5)$$

Stock exchange. See *The Toronto Stock Exchange Review*.

²⁹ The latter is the case for firms in the mining industries as well as in the oil and gas sector. All of the industrial firms in the sample report exports to the U.S. either in *Scotts Directories* or in the COMPUSTAT PC PLUS geographic segment database.

V. Empirical Results

For both the listing period and the announcement analyses, OLS estimates of excess returns of the firms, defined as returns in excess of the three-month Canadian Treasury bill rate on the excess market returns in the estimation period, yielded alphas that were on average not significantly different from zero ($\alpha = 0.0021$; $t = 0.4367$ and $\alpha = 0.0034$; $t = 0.5342$ respectively). This suggests that survivorship/selection bias does not cause a problem in this sample. In order to conserve space, the market model results will be summarized herein.³⁰

First, on average, the firms in the sample experience a small reduction in the risk parameter, β , which is not significantly different from zero ($t = -0.2394$). Second, for the entire 79 sample observations, only a mild response is observed around the listing date. The positive cumulative average residual of about 0.67% (7.37% *excess return* per annum) from day -1 to day 0 is only significant at the 0.10 level. However, very sizeable and significant *abnormal returns* are found over the sixty trading day period before the event. This period encompasses the announcement dates for most of the companies. Abnormal returns are 8.47% ($z=3.1210$) over the 60 trading days prior to listing. This corresponds to an *excess return* of 31.06% on an annualized basis.³¹ These findings are consistent with FK (1993) who found small and insignificant effects on the listing dates, though fairly substantial returns prior to listing. There is also evidence of negative stock market performance subsequent to U.S. listing, which is only significant for NYSE firms. Over the thirty day post-listing period, a cumulative abnormal return of -0.0315 ($z = -2.0726$) is observed for the latter. AMEX and NASDAQ listed-firms, however, do not show significant post-listing

³⁰ Detailed results are available on request.

³¹ Miller (1996) does not test for abnormal returns for this longer pre-event window. For his sample, he finds negative but insignificant cumulative abnormal returns over the 25 days prior to listing. Over this window, in contrast, this sample of Canadian firms show a positive cumulative average abnormal return (CAR=.0476), which is significant at the .10 level ($z=1.6955$).

negative abnormal returns. Hence, only NYSE listed-firms show effects consistent with the *post-listing puzzle* observed by McConnell and Sanger (1987), AEJ (1988), FK (1993), and Miller (1996).

Tables III to VI show the abnormal returns obtained when the analysis is performed using as the event date the first *announcement* that the firm is seeking to list in the U.S. As with the listing date analysis, on average, firms do not experience a significant change in the risk parameter, β . There are two further notable results of this analysis:

a) Significant abnormal performance is observed in the announcement period.

For the interval -1 to +1 the CAR is 0.0217 with a value of $z=3.3902$. This result suggests that the beneficial effects of international listing are impounded in stock prices when the information about listing is first available to investors. This result explains the small price changes observed at the time of actual listing shown above, as well as in previous studies (AER (1988) and FK (1993)) that focus on the listing date rather than the announcement date. The significant announcement effect is also consistent with KM's (1994) findings for U.S. listings, and Miller's (1996) results for ADR listings.

The announcement effect, however, is weaker for firms that announce that they are listing on AMEX, as opposed to the NYSE or AMEX. In particular, the day 0 abnormal returns are statistically significant only for firms listing on the NYSE ($z=2.1740$) and NASDAQ (2.1796) (vs. $z=1.1153$ on day 0 for AMEX listed-firms). This result may be indicative of relative liquidity benefits associated with the NYSE, as shown by Eleswarapu (1997), and visibility benefits for NYSE listing adduced by Baker and Edelman (1992).³²

b) Small pre-announcement abnormal returns

There is only a small buildup of CARs before the event when all the firms are included in the analysis. This result indicates that the event represents a surprise for the stocks in the sample as a whole.

³²Miller (1996) does not test for differences across exchanges for his sample of Level III ADRs.

However, these results vary across exchanges of listing. In particular, we find a large *pre-announcement* abnormal return (CAR = 0.095) and significant ($z=6.5907$) for the NYSE sub-sample. It is interesting to note that firms listed in the AMEX firms (CAR= 0.0067; $z= 0.7933$) and NASDAQ (CAR = 0 .0139; $z= 0.5830$) show no significant pre-announcement effects. These differences are statistically significant and may reflect the fact that higher quality firms are listing on the NYSE as opposed to the other exchanges.³³

[Insert Table III to VI About Here]

Joint tests of the investor recognition hypothesis, and the differential abnormal performance since the introduction of MJDS are shown in the cross sectional regressions in Table VII. Here, the companies' cumulative abnormal returns for days -1 to 0 relative to the announcement of listing in the U.S. are regressed on the variables USTRAD, and MJDS, SIZE, BTM, and EXCHR³⁴ It is evident that all of the coefficients have their anticipated signs. However, the only factor that is statistically significant is USTRAD, the percentage of the stocks trading in the U.S. market in the year subsequent to listing on the U.S. exchange. These results support the investor recognition hypothesis that states that U.S. listing adds

³³ It should be pointed out that the standards for profitability are clearly higher for NYSE listing as opposed to AMEX and NASDAQ listing. For example, for a NYSE listing, the firm must have a pretax income of \$2,500,000 in the latest fiscal year as well as the two previous fiscal years. For AMEX or NASDAQ National Market listing, the firm must have a pretax income of \$750,000 in the latest fiscal year or two of the last fiscal years. (To qualify for TSE listing, a firm only requires to show earnings before taxes of \$200,000 Canadian in the previous fiscal year). The pairwise z-statistic for differences in pre-announcement abnormal returns between NYSE firms and AMEX firms is 3.3136. The corresponding figure for NYSE vs. NASDAQ firms is 4.9877. One might argue that this result may be a further manifestation of selection/survival bias. However, survivorship bias tests did not yield significant alphas for the firms grouped by exchange listing. To further explore the effects of the time gap between the announcement to list in the U.S. and the actual listing in the U.S., I performed a cross-sectional regression of the firms cumulative abnormal return over the 60 days prior to listing and the variable DTL, which is defined as the interval, measured in days, between the listing date and the announcement date for the 79 firms in the sample. For a firm that announces and lists on the same day, this variable is zero. It has a mean(median) of 34 (40) days and a range of 0 to 280 days. The estimated coefficient of DTL is positive and statistically significant, suggesting that firms prelisting returns are enhanced, the longer is the interval between the *announcement date* and the *actual listing date*. This may reflect the fact that a wide separation between the announcement and the listing dates increases the possibility that the firm may be sending out additional positive signals. In this vein, repeat announcements are observed for eighteen of the firms in the sample.

³⁴In addition, we have also performed the regressions with dummy variables to capture industry effects. Such effects are not found to be significant and do not alter the conclusions. To test for the usefulness of other proxies for U.S. market exposure (besides the EXCHR variable), regressions were also performed using data from the COMPUSTAT PC Plus data base, which has geographic market segment data for various subsamples of these firms. Fifty five of these firms have data necessary to compute their U.S. sales shares, while thirty eight include data necessary for U.S. income shares, and forty provide data for U.S. asset shares. When the regressions were performed for various subsamples of firms incorporating these variables, none of them was found to be significant, and the conclusions discussed above are also not affected.

value by increasing the investment base of the firm. This is consistent with Merton's (1987) conjecture and KM (1994), although one should be cautious in this interpretation. It cannot be ruled out that this finding may also reflect some operational inefficiencies on the TSE.

[Insert Table VII About Here]

Finally, the lack of significance of the coefficient for MJDS is consistent with our findings reported in Section III, and do not support the (fourth) hypothesis, that the incremental abnormal returns should significantly decline in the post MJDS period due to increased market integration.

VI. Summary and Concluding Remarks

This study provides new evidence on the pricing implications of international stock listings by investigating the effects of U.S. exchange listing of Canadian common shares that were previously ineligible to U.S. investors. Recent theoretical work on capital market integration suggests that tests of the stock market effects of international listing should be conducted as joint tests: a) a test of changes in market integration that may affect asset returns through investors' portfolio reallocations as a result of changes in the investment choice set, and b) a test of changing risk premium/information effects.

Since the period examined in this study coincides with a period of regulatory change which might be perceived to enhance the integration of the two markets, the issue of accounting for this jointness might seem to be particularly acute. However, the results of this study do not show evidence of an increase in market integration associated with the regulatory changes, that could reduce the potential beneficial effects to the event of U.S. listing.

Canadian companies are currently the largest foreign contingent on the NYSE, AMEX, as well as NASDAQ, and have accounted for much of the recent growth of foreign listings on these exchanges. Officials at the U.S. Securities and Exchange Commission and the U.S. stock exchanges have proclaimed

objectives of attracting more foreign listings to U.S. markets.³⁵ The fundamental question to investors is whether foreign listing in the U.S. is consistent with shareholder wealth maximization. To date, the evidence on this issue has been limited. The significantly positive announcement effects found in this paper are consistent with this proposition, and are indicative of a reduction of the risk premium of firms operating in mildly segmented markets.

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³⁵See e.g. J.A. Byrne, Foreign Listings Showdown, *Traders* 10, Feb. 1997, p. 36.

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Table I**Summary Statistics for Daily Canadian and U.S. Excess Stock Returns,
January 3, 1977- July 31, 1997**

The Canadian stock index used to calculate returns is the TSE 300, denominated in Canadian dollars (TSE 300 CD) as well as U.S. dollars (TSE300 US\$). The excess returns are calculated as returns net of the three-month Canadian Treasury bill yield. The U.S. Index is the S&P 500, and excess returns are determined as returns net of the three-month U.S. Treasury bill yield. Under the hypothesis of normality, the Jarque-Bera statistic is distributed as χ^2 with 2 degrees of freedom.

* indicates significant at .01 level.

Panel A. Distributional Statistics for Daily Excess Return Series

<u>Statistic</u>	<u>TSE 300 (CD)</u>	<u>TSE 300 (US\$)</u>	<u>S&P 500</u>
Mean	.0263	.0261	.0254
Median	.0284	.0280	.0008
Maximum	9.0088	9.0340	9.084
Minimum	-11.3002	-11.2772	-20.443
Std. Dev.	.7294	.7304	.9196
Skewness	-1.0194*	-1.0100*	-2.087*
Kurtosis	25.5268*	25.3082*	55.120*
Jarque-Bera Stat.	114431*	112222*	611491*
Number of Obs.	5368	5368	5368

Panel B. Autocorrelations of Canadian and U.S. Daily Excess Return Series

* indicates significant at .01 level

<u>Statistic</u>	<u>TSE 300 (CD)</u>	<u>TSE 300 (US\$)</u>	<u>S&P 500</u>
ρ_1	.2309*	.2311*	.0392*
ρ_2	.0149	.0148	-.0240
ρ_3	.0242	.0241	-.0286
ρ_4	.0393*	.0390*	-.0284
ρ_5	.0475*	.0477*	.0283
ρ_6	-.0036*	-.0031*	-.0026
Ljung-Box Q(6)	311.3145*	311.5730*	24.4492*

Panel C. Autocorrelations of Canadian and U. S. Squared Excess Return Series

* indicates significant at .01 level

<u>Statistic</u>	<u>TSE 300 (CD)</u>	<u>TSE 300 (US\$)</u>	<u>S&P 500</u>
ρ_1	.3656*	.3612*	.1401*
ρ_2	.3685*	.3689*	.1892*
ρ_3	.2330*	.2329*	.0976*
ρ_4	.1470*	.1452*	.0283
ρ_5	.2393*	.2375*	.1502*
ρ_6	.0552*	.0553*	.0360*
Ljung-Box Q(6)	2179.5976*	2156.1938*	481.3622*

Panel D. Cross-Correlations of Daily S&P 500 and Daily Canadian Excess Return Series

* indicates significant at .01 level

<u>Lag</u>	<u>TSE 300 (CD)</u>	<u>TSE 300 (US\$)</u>
-6	-.0032	.0032
-5	.0607*	.0605*
-4	-.0020	-.0020
-3	.0317*	.0317*
-2	.0043	.0041
-1	.2491*	.2488*
0	.6467*	.6469
1	.0137	.0140
2	-.0101	-.0102
3	-.0334*	-.0334
4	-.0032	-.0033
5	-.0047	-.0047
6	-.0016	-.0015
Ljung-Box Q(1 , 6)	7.7187	7.8020

Ljung-Box Q(-6,-1)	358.6760*	357.7078*
Ljung-Box Q(-6,6)	2611.7032*	2612.6564

Panel E. Cross-Correlations of Daily S&P 500 and Daily Canadian Squared Excess Return Series
* indicates significant at .01 level

<u>Lag</u>	<u>TSE 300 (CD)</u>	<u>TSE 300 (US\$)</u>
-6	.0365*	.0365*
-5	.2891*	.2878*
-4	.0672*	.0673*
-3	.1898*	.1896*
-2	.4303	.4332*
-1	.3126*	.3086*
0	.8051*	.8045*
1	.1309*	.1302*
2	.1514*	.1511*
3	.1141*	.1145*
4	.0553*	.0548*
5	.1164*	.1162*
6	.0435*	.0437*
Ljung-Box Q(1 , 6)	384.4502	383.2149*
Ljung-Box Q(-6,-1)	2193.2808*	2189.2688*
Ljung-Box Q(-6,6)	6057.6534*	6047.8444*

Table II

Estimates of a bivariate model of daily expected excess stock returns for U.S. and Canadian stock markets, January 3, 1977-July 31, 1997

The Canadian stock index used to calculate returns is the TSE 300, denominated in Canadian dollars (TSE 300 CD) as well as U.S. dollars (TSE300 US\$). The excess returns r_{TSE} are calculated as returns net of the daily three-month Canadian Treasury bill yield. The U.S. Index is the S&P 500, and excess returns r_{US} are determined as returns net of the daily three-month U.S. Treasury bill yield. The market weights w_{TSE} and w_{US} are market weights computed as daily interpolations from monthly data from Morgan Stanley Capital International, and sum to unity in each regression. The indicator variable D_t is equal to one on July 1, 1991, the date of inauguration of the MJDS between the U.S. and Canada. Robust t-statistics computed with quasi-maximum likelihood estimates are shown in parentheses. An asterisk indicates significant at .05 level. The model parameters are from the following equations:

$$r_{TSE,t} = \mathbf{a}_{00} + (\mathbf{b}_0 + \mathbf{I}_{00}D_t)\mathbf{w}_{TSE,t}h_{TSE,t} + (\mathbf{b}_{01} + \mathbf{I}_{01}D_t)(1 - \mathbf{w}_{TSE,t})h_{TSE-US,t} + \mathbf{e}_{TSE,t}$$

$$r_{US,t} = \mathbf{a}_{11} + (\mathbf{b}_1 + \mathbf{I}_{10}D_t)\mathbf{w}_{US,t}h_{US,t} + (\mathbf{b}_{11} + \mathbf{I}_{11}D_t)(1 - \mathbf{w}_{US,t})h_{TSE-US,t} + \mathbf{e}_{US,t}$$

$$\begin{bmatrix} \mathbf{e}_{TSE} \\ \mathbf{e}_{US} \end{bmatrix} = \mathbf{e}_t \sim N(0, H_t), H_t = \begin{bmatrix} h_{TSE,t} & h_{TSE-US,t} \\ h_{TSE-US,t} & h_{US,t} \end{bmatrix} = \mathbf{Q}'\mathbf{Q} + \mathbf{G}'H_t\mathbf{G} + \mathbf{C}'\mathbf{e}_t\mathbf{e}_t'\mathbf{C}$$

	\mathbf{a}_{00}	\mathbf{b}_0	\mathbf{b}_{01}	\mathbf{I}_{00}	\mathbf{I}_{01}	\mathbf{a}_{11}	\mathbf{b}_1	\mathbf{b}_{11}	\mathbf{I}_{10}	\mathbf{I}_{11}	log-likelihood
A. Canadian \$ Returns											
1. Unrestricted	.0600*	.6836*	-.1510*	-1.9523	.2283	-.0175	.0074	1.3586*	.1950*	-2.4767	-332.6346
	(4.9916)	(2.3885)	(-4.8365)	(-.9949)		(1.5435)	(-.9171)	(.2364)	(3.6649)	(2.2305)	(-1.0179)
2. Restricted	0684*	.6219*	-.1476*	-	-	.0090	.0079	1.1949*	-	-	-377.7304
	(6.2202)	(2.3885)	(-4.7136)	-	(.5070)	(.2512)	(3.1818)	-	-	-	
B. U.S. \$ Returns											
2. Unrestricted	.0592*	.6384	-.1685	-1.8436	0.1797	0.109	.0129	1.2377	.1987*	-1.9180	-301.7667
	(5.1077)	(2.1475)	(-4.6806)	(-.9538)		(1.4394)	(-.6966)	(.3267)	(.35630)	(2.2814)	(-.9508)

2. Restricted

0680*	.6261*	-.1466*	-	-	.0090	.0080	1.1924*	-	-	-336.5328
(6.1952)	(2.1765)	(-4.7012)	-	(.5058)	(.2537)	(3.1684)	-	-		

Table III
Effects of Listing Canadian Companies in the U.S.: Market Model Abnormal Returns
(AR), Cumulative Abnormal Returns (CAR), 79 Companies,
January 1985 - December 1996

Day 0 is the Date of First Announcement of Listing on a U.S. Exchange.

***significant at .05 level; **significant at .10 level**

<u>Day</u>	<u>AR</u>	<u>z</u>	<u>Percent Positive</u>	<u>Window Interval</u>	<u>CAR</u>	<u>z - CAR</u>	<u>Percent Positive</u>
-10	-0.0006	0.3292	44.3	-10,+ 10	0.0075	1.3174	54.4
-9	0.0034	1.5045	50.6	-10, 0	0.0157	2.0034*	59.5
-8	-0.0044	-0.8308	43	0 , +10	0.0022	0.583	45.6
-7	-0.003	-0.9468	44.3	-1, 0	0.0165	3.1823*	58.2
-6	0.3*10 ⁻⁴	0.2672	41.8	0 , +1	0.0155	2.7666*	57
-5	0.0008	0.1394	49.4	-1, +1	0.0217	3.3902*	57
-4	-0.0042	-0.8425	46.8	-3,+3	0.0245	2.6708*	50.6
-3	0.4*10 ⁻⁴	0.1145	49.4	-30, 0	0.0188	1.2503	51.9
-2	0.0072	2.4088*	58.2	0, +30	-0.0074	-0.62	44.3
-1	0.0061	1.9594**	51.9	-60, 0	0.0383	2.5214*	59.5
0	0.0104	2.5411*	51.9				
1	0.0051	1.3715	49.4				
2	-0.0017	-1.0284	35.4				
3	-0.0026	-0.3005	46.8				
4	-0.0013	0.2716	53.2				
5	-0.0025	-0.3771	45.6				
6	-0.0018	-1.1456	45.6				
7	-.2*10 ⁻⁴	-0.2259	45.6				
8	0.0055	2.2576	45.6				
9	0.0008	0.8555	43				
10	-0.0098	-2.2861*	40.5				
	<u>β change</u>						
Mean	-0.081						
t-stat	-1.0968						
Median	-0.0974						

Table IV
Effects of Listing Canadian Companies in the U.S.: Market Model Abnormal
Returns (AR), Cumulative Abnormal Returns (CAR), 25 Companies,
January 1985 - December 1996

Day 0 is the Date of First Announcement of Listing on the NYSE.

*significant at .05 level; **significant at .10 level

<u>Day</u>	<u>AR</u>	<u>z</u>	<u>Percent</u> <u>Positive</u>	<u>Window</u> <u>Interval</u>	<u>CAR</u>	<u>z - CAR</u>	<u>Percent</u> <u>Positive</u>
-10	0.0018	0.7288	48	-10,+ 10	0.0286	1.8019**	68
-9	-0.0014	0.093	40	-10, 0	0.0174	1.7000**	68
-8	-0.0015	-0.527	56	0 , +10	0.0182	1.4454	48
-7	-0.0054	-0.8143	48	-1, 0	0.0141	2.8356*	60
-6	0.0005	0.1995	44	0 , +1	0.004	1.0453	48
-5	-0.0018	-0.6013	44	-1, +1	0.012	1.9135**	64
-4	0.0011	0.4158	56	-3,+3	0.0233	2.0974*	60
-3	-0.001	0.0357	44	-30, 0	0.0429	3.1875*	60
-2	0.0112	2.0974*	76	0, +30	-0.0186	-1.0742	44
-1	0.0071	1.8361**	56	-60, 0	0.095	6.5907*	64
0	0.007	2.1740*	56				
1	-0.0021	-0.6958	36				
2	-0.0017	-0.5288	36				
3	0.003	0.6307	40				
4	-0.0024	-0.494	52				
5	-0.0001	-0.3777	48				
6	-0.001	-0.3017	40				
7	0.0041	0.4395	48				
8	0.0023	1.0885	48				
9	0.01	3.3063*	52				
10	-0.001	-0.4472	44				

β change

Mean -0.1279

t-stat -1.1934

Median -0.2154

Table V
Effects of Listing Canadian Companies in the U.S.: Market Model Abnormal
Returns (AR), Cumulative Abnormal Returns (CAR), 14 Companies,
January 1985 - December 1996

Day 0 is the Date of First Announcement of Listing on AMEX.

***significant at .05 level; **significant at .10 level**

<u>Day</u>	<u>AR</u>	<u>z</u>	Percent <u>Positive</u>	<u>Window</u> <u>Interval</u>	<u>CAR</u>	<u>z - CAR</u>	Percent <u>Positive</u>
-10	-0.0189	-2.5975*	21.4	-10,+ 10	-0.0423	-0.9467	50
-9	0.017	2.2166*	64.3	-10, 0	-0.0016	0.365	50
-8	-0.0078	-0.73	35.7	0 , +10	-0.0347	-1.3367	35.7
-7	-0.0057	-1.034	28.6	-1, 0	0.0094	1.2889	57.1
-6	-0.001	-0.1869	57.1	0 , +1	0.0134	1.7139**	71.4
-5	0.0109	1.8726**	57.1	-1, +1	0.0169	1.8078**	57.1
-4	-0.0045	-0.5007	50	-3,+3	0.0186	1.4095	64.3
-3	-0.0032	0.0438	42.9	-30, 0	0.0344	1.584	57.1
-2	0.0021	0.3039	50	0, +30	-0.0127	-0.8674	35.7
-1	0.0035	0.7075	42.9	-60, 0	0.0067	0.7933	57.1
0	0.006	1.1153	64.3				
1	0.0074	1.3085	57.1				
2	-0.0002	-0.2425	28.6				
3	0.003	0.4926	71.4				
4	-0.0073	-0.8898	42.9				
5	-0.0035	-0.5513	28.6				
6	-0.0136	-1.9459**	28.6				
7	-0.011	-1.5330*	28.6				
8	0.0085	1.4127	42.9				
9	-0.0067	-0.9497	42.9				
10	-0.0169	-2.6504*	28.6				

β change

Mean 0.1172
t-stat 0.3414

Median

0.0787

Table VI
Effects of Listing Canadian Companies in the U.S.: Market Model Abnormal
Returns (AR), Cumulative Abnormal Returns (CAR), 40 Companies,
January 1985 - December 1996

Day 0 is the Date of First Announcement of Listing on NASDAQ.

***significant at .05 level; **significant at .10 level**

<u>Day</u>	<u>AR</u>	<u>z</u>	Percent <u>Positive</u>	<u>Window</u> <u>Interval</u>	<u>CAR</u>	<u>z - CAR</u>	Percent <u>Positive</u>
-10	0.0042	1.4231	50	-10,+ 10	0.0117	0.9869	47.5
-9	0.0017	0.7296	52.5	-10, 0	0.0217	1.2557	57.5
-8	-0.0051	-0.3185	37.5	0 , +10	0.0005	0.4676	47.5
-7	-0.0005	-0.0751	47.5	-1, 0	0.0205	1.468	55
-6	.2*10 ⁻⁴	0.3283	37.5	0 , +1	0.023	2.1821*	55
-5	-0.0011	-0.4365	50	-1, +1	0.0293	2.3426*	55
-4	-0.0072	-1.2164	40	-3,+3	0.0273	1.2614	45
-3	0.0019	0.1068	55	-30, 0	-0.0017	-0.0772	45
-2	0.0064	1.5473	50	0, +30	0.0049	-0.2496	47.5
-1	0.0063	0.8835	52.5	-60, 0	0.0139	0.583	57.5
0	0.0141	2.1926*	57.5				
1	0.0088	1.7034**	55				
2	-0.0023	-0.8838	37.5				
3	-0.008	-1.2123	42.5				
4	0.0016	1.2986	57.5				
5	-0.0035	0.0949	47.5				
6	0.0019	-0.2202	50				
7	0.0012	0.2421	50				
8	0.0064	1.4764	50				
9	-0.0023	-0.8497	37.5				
10	-0.0127	-1.2912	42.5				

β change

Mean -0.0665

t-stat	-1.1523
Median	-0.1473

Table VII
Cross-Sectional Analysis of the Abnormal Returns to Canadian Companies
Listing on a U.S. Stock Exchange,
January 1985 - December 1996

The dependent variable is the cumulative abnormal return for days -1 to 0 associated with the announcement of the listing of a Canadian company on a U.S. stock exchange. The sample consists of 79 observations from 1985-96 (t-statistics are shown in parentheses).

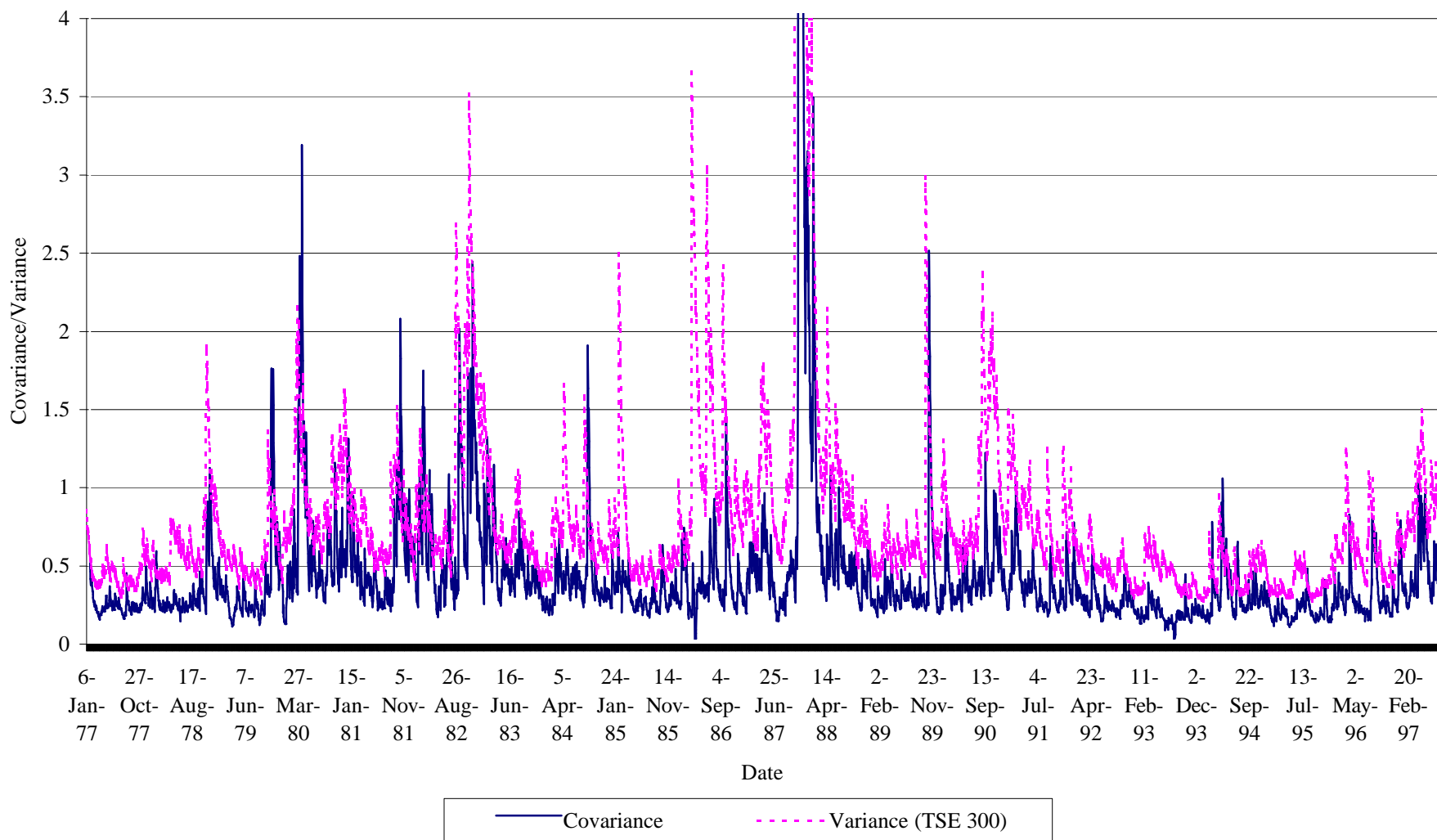
* indicates significant at .05 level

	<u>CONST.</u>	<u>USTRAD</u>	<u>MJDS</u>	<u>SIZE</u>	<u>BTM</u>	<u>EXCHR</u>	<u>R²</u>
(1)	-.0012 (-.0070)	.0397* (2.0326)	-.0001 (-.0350)	$-.2 \times 10^{-7}$ (-.0856)	.0061 (.4060)	.0005 (.0044)	.0649
(2)	-.0012 (-.7563)	.0399* (2.0031)	- -	$-.2 \times 10^{-7}$ (.0797)	.0063 (.4105)	-	.0652
(3)	-.0125 (-.8678)	.0402* (2.0645)	- -	- -	.0064 (.4283)	-	.0652
(4)	-.0079 (-.8315)	.0388* (2.0018)	- -	- -	- -	-	.0653

The independent variables are defined as:

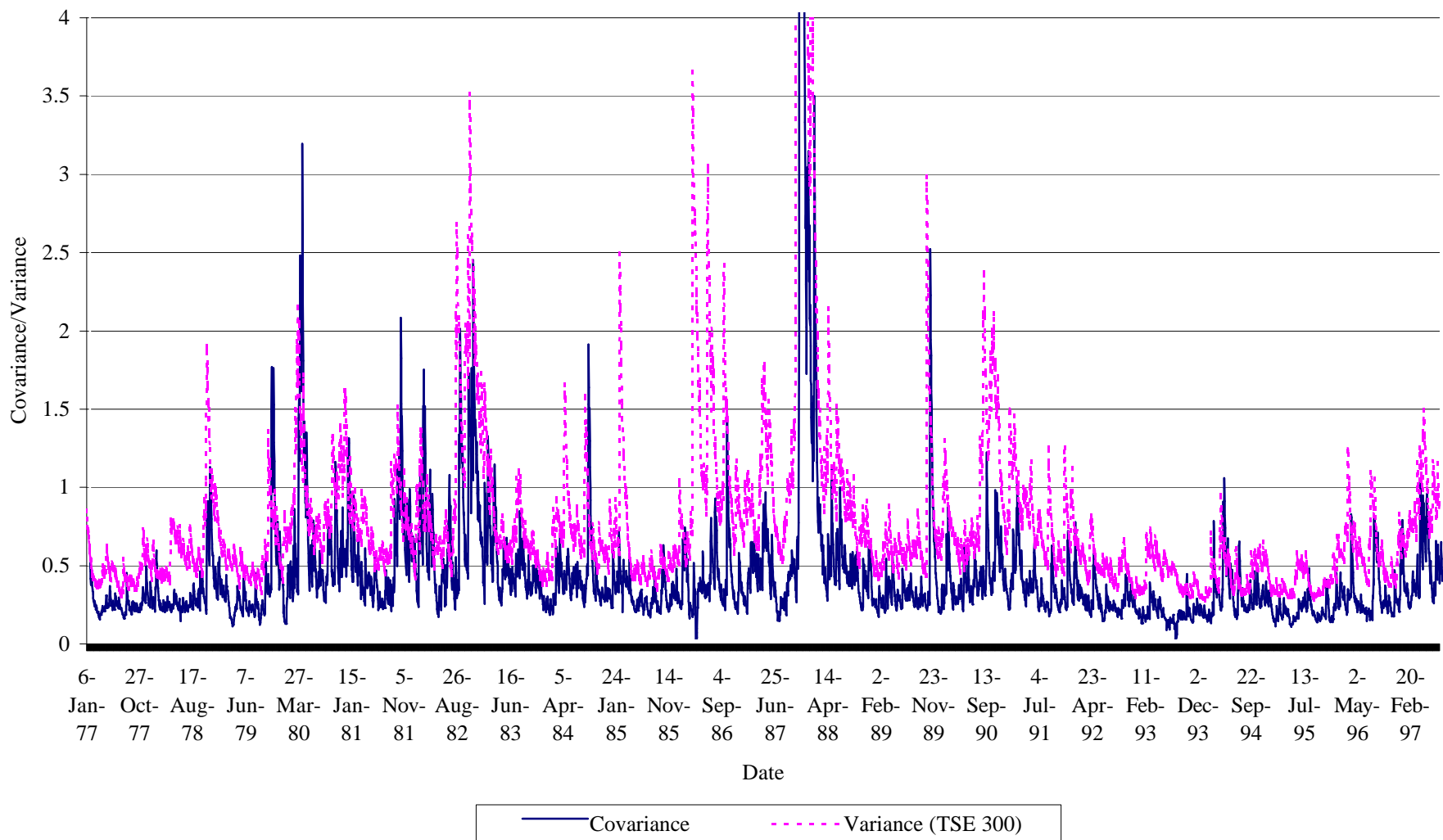
1. USTRAD: the percentage of the value of the firms shares that are traded in the U.S. market as opposed to the Canadian market over the year subsequent to listing
2. MJDS: a dummy variable equal to 1 for firms that list in the U.S. after the introduction of the Multi-Jurisdictional Disclosure System on July 1, 1991 and 0 otherwise.
3. SIZE - firm size, proxied by the natural logarithm of the value of the firms market equity at the end of the fiscal year prior to the time of the listing (price per share times the number of shares outstanding)
4. BTM - the natural log of the firms book to market equity ratio, where the numerator is calculated as the book value of the firms common equity plus deferred taxes in the fiscal year prior to listing in the U.S. and the denominator is the value of the firms market equity at the end of the fiscal year prior to the time of the listing (price per share times the number of shares outstanding)
5. EXCHR - defined as the Canada/US exchange rate at the time of listing (#\$ Canadian/\$U.S.).

Conditional Covariance of U.S. vs. Canadian Excess Returns, 1977 - 97
Panel A: TSE300 (Cdn\$) vs. S&P500



Conditional covariance and variance of the risk premium on Canadian equity (in Cdn\$) and US equity from Jan. 4, 1977 to July 31, 1997. The fitted values are computed from estimates of the bivariate GARCH model.

Conditional Covariance of U.S. vs. Cdn./U.S. Excess Returns, 1977 - 97
Panel B: TSE 300 (US\$) vs. S&P 500



Conditional covariance and variance of the risk premium on Canadian equity (in Cdn\$) and US equity from Jan. 4, 1977 to July 31, 1997. The fitted values are computed from estimates of the bivariate GARCH model.