

2007s-26

Competition and Survival of Stock Exchanges: Lessons From Canada

Cécile Carpentier, Jean-François L'Her, Jean-Marc Suret

Série Scientifique
Scientific Series

Montréal
Novembre 2007

© 2007 *Cécile Carpentier, Jean-François L'Her, Jean-Marc Suret.* Tous droits réservés. All rights reserved.
Reproduction partielle permise avec citation du document source, incluant la notice ©.
Short sections may be quoted without explicit permission, if full credit, including © notice, is given to the source.



Centre interuniversitaire de recherche en analyse des organisations

CIRANO

Le CIRANO est un organisme sans but lucratif constitué en vertu de la Loi des compagnies du Québec. Le financement de son infrastructure et de ses activités de recherche provient des cotisations de ses organisations-membres, d'une subvention d'infrastructure du Ministère du Développement économique et régional et de la Recherche, de même que des subventions et mandats obtenus par ses équipes de recherche.

CIRANO is a private non-profit organization incorporated under the Québec Companies Act. Its infrastructure and research activities are funded through fees paid by member organizations, an infrastructure grant from the Ministère du Développement économique et régional et de la Recherche, and grants and research mandates obtained by its research teams.

Les partenaires du CIRANO

Partenaire majeur

Ministère du Développement économique, de l’Innovation et de l’Exportation

Partenaires corporatifs

Alcan inc.

Banque de développement du Canada

Banque du Canada

Banque Laurentienne du Canada

Banque Nationale du Canada

Banque Royale du Canada

Banque Scotia Bell Canada

BMO Groupe financier

Bourse de Montréal

Caisse de dépôt et placement du Québec

DMR Conseil

Fédération des caisses Desjardins du Québec

Gaz de France

Gaz Métro

Hydro-Québec

Industrie Canada

Investissements PSP

Ministère des Finances du Québec

Raymond Chabot Grant Thornton

State Street Global Advisors

Transat A.T.

Ville de Montréal

Partenaires universitaires

École Polytechnique de Montréal

HEC Montréal

McGill University

Université Concordia

Université de Montréal

Université de Sherbrooke

Université du Québec

Université du Québec à Montréal

Université Laval

Le CIRANO collabore avec de nombreux centres et chaires de recherche universitaires dont on peut consulter la liste sur son site web

Les cahiers de la série scientifique (CS) visent à rendre accessibles des résultats de recherche effectuée au CIRANO afin de susciter échanges et commentaires. Ces cahiers sont écrits dans le style des publications scientifiques. Les idées et les opinions émises sont sous l’unique responsabilité des auteurs et ne représentent pas nécessairement les positions du CIRANO ou de ses partenaires.

This paper presents research carried out at CIRANO and aims at encouraging discussion and comment. The observations and viewpoints expressed are the sole responsibility of the authors. They do not necessarily represent positions of CIRANO or its partners.

ISSN 1198-8177

Partenaire financier



Competition and Survival of Stock Exchanges: Lessons From Canada

*Cécile Carpentier, Jean-François L'Her and Jean-Marc Suret**

Résumé / Abstract

Nous étudions la concurrence entre deux marchés boursiers développés, ceux du Canada et des États-Unis. Le développement des Bourses repose en grande partie sur leur capacité à attirer et retenir les inscriptions et les transactions. Le marché américain attire un nombre important de sociétés canadiennes, et capture une proportion croissante des échanges de titres de ces sociétés. Ce glissement des transactions représente un défi important pour le Canada dont les efforts pour contrer cette évolution semblent avoir eu des effets limités. Nous analysons les implications de cette situation en ce qui concerne la région Asie-Pacifique, où une concurrence importante existe entre les divers centres financiers en émergence.

Mots-clés: Marché Boursier, concurrence, titres interlistés

We analyze the competition between two developed stock exchanges. Their development rests mainly on their capacity to attract securities and trades. The U.S. market is attracting a growing number of Canadian companies, and is capturing a growing portion of their traded value. This slide of trading toward the U.S. market is a huge challenge for Canadian policy makers, while the efforts to compete with the U.S. market seem to be having only limited effects. We analyze the implications of this situation for policy makers in Asia-Pacific, where several markets and financial centers are attempting to emerge.

Keywords: *securities exchange, competition, cross-listed securities*

Codes JEL : G12, G18 et F36

* Cécile Carpentier is from Laval University, email: Cecile.carpentier@fsa.ulaval.ca, Jean-François L'Her is from La Caisse de dépôt et placement du Québec, e-mail: jher@lacaisse.com; Jean-Marc Suret (corresponding author) is from Laval University, Faculty of Administrative Science, School of Accountancy, 6226 Pavilion Palasis-Prince, G1K 7P4, Québec, Canada, phone: (418) 656 7134, fax: (418) 656 7746, email: Jean-marc.suret@fsa.ulaval.ca. The authors assume full responsibility for any errors remaining in the text. The views expressed in this article are those of the authors and do not necessarily reflect the position of the Caisse de dépôt et placement du Québec. The researchers thank Serge Dumais for valuable research assistance.

COMPETITION AND SURVIVAL OF SECURITIES MARKETS: LESSONS FROM CANADA

From 1990 to 1999, Cybo-Ottone *et al.* (2000) list about 100 consolidation deals covering stock exchanges in both the European Union (E.U.) and the United States (U.S.). The recent merge of NYSE and Euronext (April 04, 2007) illustrates the rapid move toward a worldwide integration of stock exchanges. Several authors view this evolution as inevitable. According to Coffee (2002), the number of securities exchanges in the world will likely shrink radically because of globalization and technology. DiNoia (2001) argues that in theory, competition among securities exchanges will ultimately result in a single market, except when exchanges negotiate alliances that convert them into cooperative networks. He posits that the consolidation of the European exchanges may produce a welfare-efficient outcome and that integrated markets mean that the welfare of national firms and intermediaries does not depend on their national exchange. Steil (2002) foresees the integration of the U.S. and the E.U. securities markets through mutual agreement. He argues that this initiative would reduce trading costs, increase investment returns, lower the cost of capital and stimulate economic growth on both sides of the Atlantic. Several international financial centers (IFC), in which efficient and strong stock exchanges are major components, compete in the Asia-Pacific area (Laurenceson and Tang, 2005). Wang (2000: 45) proposes that attracting foreign capital is the key measure for Singapore to become a major IFC: “the most effective measure to accelerate Singapore’s effort in becoming a regional financial center is to attract more foreign funds and regional companies for listing on the Stock Exchange of Singapore.” Our paper focuses on this dimension of the competition between stock exchanges.

In this context of increasing competition, the survival of small securities markets can be considered imperiled. Indeed, it is not necessary for all countries to have full-fledged securities markets for economic development, when capital markets are open and accessible internationally. However, the disappearance of the national markets has several negative implications. In Canada, Boisvert and Gaa (2001) note that such an event would have major consequences in terms of public policy and economic activity. Marano (2000) expresses her concern about the Italian market as follows: “there is evidence that financial activity permits higher economic growth. The worry is that, if national financial centers disappear, local firms and households might end up having more, rather than less, difficulties in financing”. The concerns about the integration of the

main exchanges are threefold: 1) the stock exchange is generally predominant within financial centers, which generate strong economic activity based on highly skilled people; 2) the development effects of strong national stock markets is well documented and 3) the integrated large stock market can easily address the financing needs of large and international companies, but we do not know if they are able (or interested) to meet the needs of small firms, which generate smaller transaction volumes and fees (Ferrarini, 2002). Israeli authorities have implemented regulatory programs aimed at luring back home Israeli companies listed only on U.S. stock markets (Licht, 2001). Wang (2000) reports that the Singapore government implemented many reforms in the past two decades to make Singapore a major IFC. In the same vein, Laurenceson and Tang (2005: 163) report that “Shanghai’s political leadership has set 10 to 20 years as a timeframe for achieving IFC status”. The authors recall that established IFCs can decline due to competition from new challengers: Shanghai was the leading IFC in Asia in 1949, but nowadays Tokyo, Hong Kong and Singapore are the major IFCs competing in this region. Indeed, the preservation of a national securities market is a concern for several countries, and it is worth examining how realistic this preservation is.

A great deal of attention has been devoted to the requisite conditions for a sound stock market to emerge (Levine *et al.*, 2000). Several studies attempt to explain the migration of stocks from less developed toward more established financial centers (Claessens *et al.*, 2002; Levine and Schmukler, 2007). However, little is known about the competition between stock markets that share similar characteristics in terms of rules of law, accounting standards, contract realization and level of corruption. In this paper, we analyze the evolution of a small albeit well-developed market, which competes with the U.S. market for trades and listings. Our paper focuses on the cross-listing decisions and consequences on firms in both countries, because, according to Coffee (2002:14): “by far, the principal mechanism that produces competition among market centers has been the issuer decision to cross-list its securities on a foreign exchange”. We extend previous work by analyzing a case where the smaller market decides to compete to remain in operation while reducing the advantage of the larger market. To estimate the effects of cross-listing on trade activity, we follow trading for 17 years (1990-2006). Previous studies tend to analyze a limited period of time, using cross-sectional regression or pooled data regression (Pagano *et al.*, 2001). Alternately, research has investigated the short-term effects of cross-listing on prices, volumes and turnover. In addition, we analyze two noteworthy dimensions to understand the

competition between the exchanges. First, we consider the total number of companies that list abroad, including the reasons they disappear from the official list of cross-listed stocks. 548 Canadian companies have cross-listed in the U.S. since the beginning of 1990, but more than 355 disappeared from the official lists. We also analyze the long-run changes in the distribution of trades between the two markets.

The analysis of the Canadian case is of interest for the Asia-Pacific situation for several reasons. First, the Canadian market is, by far, the market that is most closely linked to the U.S. market. The interlisting of Canadian corporations has been facilitated by the implementation of the Multijurisdictional Disclosure System (MJDS), which allows Canadian corporations to list their stocks in the U.S. under less rigorous criteria than those that apply to other non-American corporations. As mentioned by de Brouwer (2003), similar albeit limited actions have been implemented between several markets, such as Australia and Singapore and Japan and Singapore. This author strongly recommends such initiatives intended to link stock exchanges and promote integration in the region. The integration of the Canadian and U.S. exchanges in the past twenty years thus parallels the situation prevailing between several European markets, and the situation that could prevail in the Asian Pacific area if the integration efforts are completed. Canadian firms are the single largest group of foreign firms listed on U.S. securities exchanges, with 216 (193) firms cross-listed in 2000 (2006). Opinions about the trends within the Canadian securities market are strongly opposed. Several authors hold a relatively optimistic view. Boisvert and Gaa (2002: 15) mention that “in Canada, the number of shares on the Toronto Stock Exchange has doubled in the last five years, while the dollar value of trading has increased three-fold”. Jenkinson and Ljungqvist (2001) place Canada among countries that saw the highest increases in stock exchange listings from 1981 to 1998, far ahead of the U.S., Japan and the United Kingdom. Freedman and Engert (2003:13) of the Bank of Canada, conclude that “data do not provide much support for the view that domestic capital markets have been abandoned by Canadian firms or hollowed out in recent years”. By contrast, Reguly (1999) argues that the Toronto stock exchange (TSX) is a clear example of the hollowing out of corporate Canada. He calls the TSX “the Incredible Vanishing Exchange,” and notes that the liquidity of the TSX is evaporating. Reguly maintains that the TSX is powerless to stop companies from marching across the border. In a second paper, Reguly (2002) questions whether Toronto is becoming the next Montreal, in terms of its stock exchange.¹ Similar concerns about liquidity and loss of firms are expressed by Oliver

(2002:3), CEO of the Investment Dealers Association of Canada. He points out that “over the last two years, 120 Canadian companies have been deleted from the TSX300”. Clearly, the discrepancy of opinions relative to the changes of the Canadian stock markets merits an in-depth analysis. Finally, the competitive position of the Canadian market recently became a central argument in the debate surrounding the modernization of securities regulation in Canada.²

In the first part of the paper, we survey the known factors that further, or hinder, the development of modern markets, and attempt to determine the significance of these factors within Canada. Then, we analyze the competitive position of the Canadian market based on the trading patterns of interlisted securities. In the second part, we present and analyze the cross-listing phenomenon in Canada. Then, we discuss the results of the tests of our hypotheses. Part three presents our concluding remarks.

1. Competitive Advantages of Securities Markets

In a context of intense competition among stock markets and trade globalization, the development of stock markets is strongly linked to their capacity to attract foreign stocks and to limit foreign trading of domestic stocks. This challenge is particularly formidable in Canada, because of the proximity and strength of the U.S. markets. As Eun and Sabherwal (2003:1) note, “attracting non-U.S. listing is now a top priority of the U.S. stock exchanges”. According to the basic principle of wealth maximization, a company should list abroad when the advantages outweigh the costs. The advantages and costs of cross-listing are summarized in the following sections.

1.1. Advantages and Costs of U.S. Listing for Canadian Firms

Karolyi (2006) summarizes the main reasons companies list abroad. There are four main advantages of cross-listing: 1) market segmentation, whereby cross-listing is a means of integrating segmented markets, thus enabling the issuer to access trapped pools of liquidity (Coffee, 2002) and reduce the cost of capital; 2) the increase in liquidity and the reduction of transaction costs; 3) the bonding hypothesis and 4) strategic considerations. The costs are mainly associated with the reconciliation with U.S. GAAP and SEC requirements.

Segmentation proposition: when two markets are not integrated, listing abroad can reduce the domestic systematic risk, which in turn reduces the company's cost of capital. Moreover, in such situations a company can find pools of liquidity in the host country that are unavailable in its country of origin. These pools of liquidity can increase the demand for the stock, and ease the issuing of new shares.

Reduction of transaction costs: Cross-listing is also of interest to traders. According to Domowitz *et al.* (2001), the execution costs are generally lower and liquidity is generally higher in the U.S. than in other countries. The authors show (Table 1) that total one-way trading costs are 52.4 basis points in Canada and 38.1 points in the U.S. According to this estimation, if a portfolio turns over every four months, annual excess costs of 85.8 basis points are incurred if the trades are executed in Canada versus the U.S. Such a difference is likely to adversely affect the competitive position of the Canadian market.

Bonding hypothesis: Firms in countries with poor protection of minority shareholders signal their desire to respect shareholders' rights by listing in a jurisdiction with higher scrutiny, tougher regulation and better enforcement. As Coffee writes (2002: 11): "cross-listing may also be a bonding mechanism by which firms incorporated in a jurisdiction with weak protection of minority rights or poor enforcement mechanisms can voluntarily subject themselves to higher disclosure standards and stricter enforcement in order to attract investors who would otherwise be reluctant to invest (or who would discount such stocks to reflect the risk of minority expropriation)." Moreover, listing in the U.S. can increase coverage by financial analysts. Lang *et al.* (2003) show that securities listed on a market other than their market of origin attract increased interest from financial analysts, and are characterized by improved forecast quality and higher prices.

Strategic advantages: To achieve strategic advantages, companies list abroad to get closer to their markets for goods and services, to imitate their competitors or to ease acquisitions. Bancel and Mittoo (2001) conclude that business-related considerations are the primary reason for listing in the U.S. Pagano *et al.* (2002) assert that firms list abroad to exploit existing product market reputation, to access foreign capital markets or – conversely – to support the company's expansion on foreign output markets.

These theoretical arguments are generally in line with the opinions of experts and managers. Canadian managers purportedly have positive perceptions of the U.S. exchange listings. Houston and Jones (2002) focus on the Canadian managers' perceptions of the benefits and costs associated with listing on the U.S. exchanges. The authors confirm that the perceived advantages are increased trading volume, following by analysts, name recognition and effects of competition. Foerster *et al.* (1999) conduct interviews with CEOs and CFOs to determine why 45 Canadian companies interlisted on a U.S. stock exchange. Of the companies surveyed, 89 per cent believed their decision to be sound. The foremost reason for interlisting was increased access to capital. Other reasons cited were increased liquidity, institutional investment, analysts' coverage and lower cost of capital. However, stringent disclosure requirements are an impediment to trans-border listings. The main perceived obstacles to listing in the U.S. are the reconciliation with U.S. GAAP disclosure requirements. Several studies have empirically assessed the magnitude of the effects of cross-listing.

1.2. Global Models

In addition to the models that explain CEOs' decision to list their firm abroad, two more general propositions are relevant to understand the global effect of inter-market competition: the gravity model and the dominant market model.

Portes and Rey (2005) apply the "gravity" model to cross-border equity flows. The gravity model is commonly used to explain trade flows between countries by the two economic masses (GDPs) and distance. The authors show that this model also works for immaterial trades in equity. The flows mainly depend on various measures of market size (GDP and market capitalization). As for goods and services, equity flows are limited by informational frictions, mainly caused by the distance between the countries. These variables explain 83% of the differences observed between cross-border equity flows. In such a model, Canada and the U.S. present maximal size differences (which favors the migration of trades) and minimal distance. Accordingly, the flow of equity from Canada toward the U.S. will likely be large, and will grow as distances shrink, fuelled by increasing integration of the markets.

Theoretical models explaining the growth of trading volume in interlisted securities indicate the emergence of a dominant market in accordance with the "winner take most" rule (Chowdhry

and Nanda, 1991). These models distinguish liquidity traders from informed traders. Liquidity traders trade without any specific basis of information and are attracted to markets where trading costs are lower and create liquidity. Informed traders base their trading on analysis and information. This group primarily comprises institutional investors that maximize their returns by trading in the most liquid markets. Accordingly, even if the total trading volume increases when a stock is listed on a secondary market, the trading volume in the country of origin may increase or, on the contrary, decrease sharply, depending on whether or not the country has a dominant market position. The models predict that the transfer of trading will continue to gravitate to the country offering the most favorable trading conditions, but, according to Karolyi (2006), why and how the order flow gravitates to one market or the other, and how this pattern changes over time, is not clear. Baruch *et al.* (2007) hypothesize and evidence that trading volume is likely to migrate to the exchange in which the cross-listed asset returns are most closely correlated with returns of other assets traded on that market, a prediction for which they find strong empirical support. However, Halling *et al.* (2006) defend the opposite point of view. They analyze trading activity after the cross-listing of European stocks, and bring to light a blip immediately after the cross-listing, followed by a trend decline, which in most cases rapidly leads to a virtual disappearance of foreign trading activity. This “flow-back” appears to be quite universal in their sample, but they observe considerable cross-sectional variation in the persistence and magnitude of foreign trading: companies with a large presence in foreign output markets should be more heavily traded abroad than other companies, since foreign investors should find it easier to collect timely and accurate information about their prospects.

1.3. Empirical Evidence

Numerous studies document the effects of cross-listing in Canada. Karolyi (1998) posits that the effects of listing abroad are generally positive. They include: 1) favorable share price reactions to cross-border listings in the first month after listing, even if this effect is only observable for foreign stocks listing in the U.S., while the price effect of U.S. companies listing in Toronto appears to be negligible (p. 18); 2) post-listing trading volume increases on average, and similar increases are observed in home-market trading volume; 3) overall improvement in the liquidity of share trading and 4) significant reduction of domestic market risk, associated with only a slight increase in global market risk and foreign exchange risk, resulting in a net reduction in the cost of

equity. This reduction, together with increased growth opportunities and decreased agency costs, can explain why foreign companies listed in the U.S. are worth more than non-interlisted firms. Karolyi (2006) finds evidence challenging the conventional wisdom that firms benefit from cross-listing. However, both empirical results and managers surveys indicate that Canadian companies that list in the U.S enjoy several advantages.

Doidge *et al.* (2007) evidence that foreign companies that list in the U.S. enjoy a cross-listing premium (CLP). Cross-listed firms should be worth more because: 1) they can take advantage of growth opportunities that they could not have taken advantage of without a listing, 2) a smaller fraction of the cash flows generated by the firms are appropriated as private benefits by insiders and 3) the cost of capital is lower in the U.S.³ or for cross-listed companies. Canadian firms listing in the U.S. exhibit a CLP in the same range as that observed by Doidge *et al.* for firms originating from other countries (King and Segal, 2007). These authors conclude that cross-listing has a positive impact on valuation over and above the positive effects associated with firm size, profitability, cost of equity and past sales growth. However, this increase in valuation disappears within two years of cross-listing (King and Segal, 2005). Only cross-listed firms that are actively traded in the U.S. market experience a significant increase in valuation over the long term. Cross-listed Canadian firms that fail to develop active share turnover in the U.S. and remain traded predominantly in Canada are valued no differently from non-cross-listed Canadian firms.

The positive valuation effect of cross-listing is consistent with the findings of Ammer *et al.* (2005). They show that firms that cross-list experience an economically and statistically significant increase in U.S. holdings, equivalent to 8 to 11 percent of the firms' equity; and that cross-listing roughly doubles U.S. investment in a foreign stock. The authors conclude that cross-listing in the U.S. substantially increases the willingness of U.S. investors to purchase foreign equity. These empirical results are consistent with the hypothesis that in the U.S., Canadian companies can capture pools of liquidity and attract more investors than in Canada. Further, exposure to the U.S. market enhances visibility and reputation, thus increasing the attractiveness for both Canadian and U.S. investors.

Cross-listing in the U.S. generally increases liquidity and trading volumes. Foerster and Karolyi (1998) document a significant drop in trading costs following the listing of stocks on an American market,⁴ especially relative to stocks with the highest degree of transfer of trading to

the U.S. This decrease is measured on the Canadian market, and shows that the Canadian market adjusts to a more competitive environment as soon as stocks are widely traded on a competitive market. Trading costs may thus be lower on the American market than on the Canadian market, and interlisting may reduce these costs on the Canadian market as well. There is little evidence to support this theory, however, as cost measurement is a difficult exercise. Costs depend on volume and liquidity, size of trade and stock price. Moreover, as evidenced by Mittoo (2003), the positive impact of U.S. listing on both trading volume and trading costs has declined over time.

The listing abroad announcement is usually preceded by a strong rally, but the post-listing performance of newly cross-listed stocks is often assumed to be negative. This effect is generally attributed to a decrease in cost of capital or to the timing of cross-listing decisions. Mittoo (2003) observes a significant negative abnormal return for new listings of Canadian stocks over the 1991-1998 period. This result is puzzling, because of the strong integration of the Canadian and American markets (Karolyi, 2006). However, Carpentier *et al.* (2007) replicate this study with a more comprehensive sample and various methodologies, and reject the hypothesis of an abnormal return following cross-listing of Canadian companies.

Overall, U.S. listing of Canadian stocks seems to induce positive short-term price effects, a positive, albeit temporary valuation effect, an increase in liquidity and a decrease in transaction costs. For these reasons, Canadian stock exchanges have faced fierce competition from U.S. exchanges in the past decade and have introduced several measures to meet this challenge. The MJDS implementation and decimalization were the main responses to this competition between the U.S. and Canadian markets during the 1990s. We summarize the main elements of these changes and present the prominent studies that analyze these changes in the benefits and costs of interlisting, from a Canadian perspective.

1.4. Competition Between the U.S. and Canada

The interlisting of Canadian corporations has been facilitated by the implementation of the MJDS, which allows Canadian corporations to list their stocks in the U.S., under less rigorous criteria than those that apply to other non-American corporations.⁵ The MJDS can be seen as an effort by the U.S. to attract Canadian listing. However, it also potentially allows better integration of both markets, thus reducing the advantages of cross-listing for Canadian companies. The effect

of the MJDS then becomes an empirical question. Houston and Jones (1999) show that the MJDS has a very limited effect on the perceived and effective costs of cross-listing, and conclude that it has not yielded the benefits originally envisioned (1999: 1).

In 1995, all Canadian stock exchanges switched from a fractional to a decimal trading system. This move was clearly intended to improve the competitiveness of the Canadian stock exchanges. Ahn *et al.* (1998) note that the decline in Canadian market share in the cross-listed stocks is one important reason for this change. All markets have a price increment (tick) that determines what price the traders use. In the U.S. and Canada, the increment was a fraction based on a divisor of 2 (1/2, 1/4, 1/8) while in the majority of stock markets, the tick is a decimal fraction (0.01, 0.05). Decreasing the size of the tick leads to a smaller bid-ask spread, which is an important component of transaction costs. Lowering the tick was thus expected to reduce the transaction costs, and consequently boost trading volumes.⁶ Harris (1997) summarizes six studies of the effects of this change on the quality of markets and on the order flows in both countries. The conclusions converge on a reduction of spreads on the TSX, and a lower or non-significant reduction of spreads on the U.S. markets. No studies report a significant increase in transaction volumes, yet some point to a minor decrease. However, as Ahn *et al.* conclude, order flows do not migrate from U.S. markets to the TSX. Chung *et al.* (1996) report that decimalization does not lead to the increased trade activity envisioned by the TSX. They observe, for interlisted stocks, little evidence that the decimalization has led to a recapture of trading lost to U.S. markets. Harris hypothesizes that decimalization has not significantly affected TSX transaction costs, and that investors in Canadian stocks are not price sensitive in the short run.

In early 2001, the U.S. exchanges decimalized. Oppenheimer and Sabherwal (2003) examine the impact of the U.S. decimalization on the trading of cross-listed Canadian stocks. The bid-ask spread declined and U.S. trading increased after the change, but not at the expense of the TSX volume. The TSX volume for stocks that trade on NASDAQ increased as well. In both Canada and the U.S., decimalization does not seem to have had a significant impact on the distribution of the transactions between the two countries. Conceivably, the bid-ask spread is only one component of the transaction cost, which is why reducing the spread does not significantly change the total cost of a trade. According to Cleary *et al.* (2002), the median total cost of (one-way) trading a stock worth more than \$20 is 2.3%. The bid-ask component is

0.045% after decimalization and 0.055% before. Such a difference can be seen as non-significant in the decision to move the location of trades.

Despite the decrease in the positive effects of cross-listing, probably linked to the growing integration of both markets, Canadian managers consider cross-listing to have numerous advantages. The next question, however, is to determine the long-run effect of this attraction on the localization of trades and, ultimately, on the activity of both markets. If the perceived advantages of listing abroad are mainly strategic, the market structure and the MJDS should have a limited impact on the decision to cross-list. However, if the quality of the U.S. market is better than that of the Canadian market, then a growing proportion of the trades should be captured by the foreign markets, and, ultimately, companies should delist from the TSX. Alternatively, if companies list in the U.S. to benefit from market segmentation, gradual integration should induce some firms to return to Canada. The changes in cross-listing, the current status of the formerly cross-listed companies and the variation in the Canadian proportion of the trades are probably among the most significant evidence of the competition between the two markets. It is also worth assessing the future of the Canadian market.

1.5. Propositions

Listing in the U.S. presents several advantages for Canadian companies. The gravity model predicts that the flow of listing will move from Canada toward the U.S. The liquidity and transactions costs of the U.S. market are likely to direct a large proportion of trades toward this market. The dominant market proposition indicates that the foreign trading volume will probably capture most transactions in Canadian stocks as their exposure to the U.S. market increases.

To date, researchers have focused on the various consequences of cross-listing on trading volume, value and returns. Studies generally rely on the lists of foreign stocks provided by the U.S. exchanges, which provides a partial picture of the intense movements of cross-listing and cross-delisting of Canadian companies. As an example, while an average of 200 stocks appear to be cross-listed at the end of each year, 548 Canadian securities have been listed in the U.S. since 1990. For these reasons, only partial evidence exists relative to the long-term changes in cross-listing, trading volumes and cross-delisting. The competitive position of the Canadian stock market is largely unknown. We therefore postulate the four following propositions.

Proposition 1: A growing number of large Canadian companies are listed in the U.S.

This proposition follows from the evidence of advantages and costs of cross-listing for Canadian companies. Advantages linked to trading costs, liquidity and access to a larger pool of investors are probably higher for the larger companies. Conversely, the supplementary regulatory costs, induced for example by the SOX regulation, should be proportionally lower for big companies.

Proposition 2: The U.S. market captures a growing number of formerly cross-listed companies

Cross-delisting occurs because companies no longer benefit from being listed in one or the other market. The gravity proposition, the cost of transaction proposition as well as the strategic argument for cross-listing, indicate that cross-listed companies can benefit from more advantages by withdrawing their listing in Canada than from retreating to this country. The proportion of cross-delisted companies becoming American-traded only should be higher than the proportion of firms retreating to Canada

Proposition 3: The U.S. market captures a growing proportion of the trades of cross-listed Canadian companies

This proposition comes from the observation of lower transaction costs and higher liquidity in the U.S., and from the dominant market theory.

Proposition 4: The competitive position of the Canadian stock market is weakening.

This proposition follows from the previous observations. According to the gravity concept, Canada is in a difficult competitive situation. The difference between sizes with the U.S. is huge and the distance is minimal. While attracting foreign listing is of major importance for the development of a stock market, the U.S. enjoys a significant advantage over Canada.

2. Cross-Listing and Canadian Securities Market

2.1. Data and Methodology

Studies of the causes and consequences of cross-listing often rely on second-hand summaries, provided by the exchanges at year end. These lists omit several foreign listing, mainly the numerous cross-delistings that occur each year, and do not provide information on the trading

values in each market. To overcome this problem, we construct our own database of Canadian interlisted stocks and trading values, from January 1990 to December 2006. We hand collected the required information from the TSX Review, which provides the monthly trading value in the domestic and the foreign market, for each cross-listed company. Monthly data are required because several securities appear to be cross-listed for just a few months. For each month and security of each firm, we collected the volume of transactions in both markets. The population is composed of 548 distinct companies, and we determined that 355 firms appear to cross-delist during the study period. We determine why these companies cease to be considered as cross-listed, using the Corporate Survey and Survey of predecessor and defunct company database of The Financial Post DataGroup, SEDAR,⁷ lists of American O.T.C. markets, Reuters & Dow Jones' FACTIVA and Internet research tools. To paint the global picture and situate the competitive position of Canada, we used the data from the World Federation of Exchanges and various editions of the Standard & Poors' Emerging Stock Market Factbook (subsequently renamed Global Stock Markets Factbook). Our methodology rests on analyses of various dimensions of the Canadian cross-listing activity and on statistical Chi-square tests.

2.2. A Global Perspective

Table 1 reports the annual number of cross-listed securities and their worldwide transaction volume. The number of these securities rose from 143 in 1990 to 244 in 1998. The decrease observed from 1999 to 2003 was offset by a sharp increase in 2004 and 2005. This increase can be partially explained by the listing of several Universal Stock Futures (USF)⁸. The growth in the number of interlisted securities was greater than the growth in the number of companies (55.94% vs. 46.21%); indicating that the number of companies that list several categories of securities in the U.S. is rising. The worldwide trading value of these stocks also grew considerably: from \$69 billion to \$1,683 billion 16 years later. In 2001, the trading value decreased from \$1,281 billion to \$805 billion, mainly because of the loss of value of Nortel Networks and BCE Inc. These numbers imply that the interlisted companies are among the largest Canadian companies.

We also report the number of cross-listed companies and the number of companies that enter and quit the interlisted group each year. In Canada, cross-listing is a highly dynamic process. In December 1989, 127 companies were listed abroad. From 1990 to 2006, 421 companies listed their stocks in the U.S.⁹ During the same period, 548 Canadian companies were

listed abroad, mainly in the U.S. A total of 355 companies ceased to be considered cross-listed, for various reasons that we analyze below. The “in and out” movements of Canadian firms from the U.S. market are in fact more intensive than indicated by the yearly summaries. On average, since 1990, 25 Canadian companies have listed abroad yearly, while 21 disappeared from the interlisted companies summary. Some years appear as outliers: in 1999 and 2001, 47 and 50 Canadian companies lost their interlisted status. The merger wave and the burst of the technological bubble are probable explanatory factors of these observations. In 2000 alone, 49 Canadian companies listed abroad.

To test the first proposition, we estimate the number and proportion of large interlisted Canadian stocks in 1990 and 2006. We limit the analysis to the 60 and 100 largest Canadian issuers. In 1990, 18 of the 60 (30%) highly capitalized Canadian stocks were interlisted. The proportion is 73% in 2006. A Chi-Square test allows us to reject the hypothesis that these two proportions are equal. Similar results were obtained with the 100 largest Canadian stocks. The proportion of interlisted stocks in this group increased from 32% to 64%, and these proportions differ at the 0.005 level of significance. In analyzing the characteristics of the 16 non-interlisted large capitalization stocks within the set of 60, two categories emerged. The first is composed of companies where the float is limited despite large capitalization, because much of the control and the shares are held by individuals or families; four such stocks are related to the Power Corporation of Canada, and two are related to the George Weston Group Limited, of which G. Weston controls 62%. The second category contains subsidiaries of foreign groups. We finally analyze the proportion of cross-listed amongst the most heavily traded stocks. We use the \$1 billion benchmark (in 2003 \$CAN, indexed by the variation in the TSE index). In 1990, 17.48% of the most intensively traded Canadian stocks were listed in the U.S. The proportion is 47.98% in 2006 and the difference is statistically significant. Accordingly, our first proposition appears to be verified. This contradicts Freedman and Engert (2003), who report relatively modest growth of interlisted shares. We contend that the proportion of interlisted stocks should be estimated relative to the sample of Canadian issuers that can satisfy the U.S. market requirements. We also consider that, in a market where the 100 largest companies account for 85% of the market capitalization,¹⁰ market trends are closely linked to the cross-listing situation and the location of trades’ of these 100 stocks.

2.3. What Became of Canadian Interlisted Companies?

From 1990 to 2006, 355 Canadian companies ceased to be cross-listed. This trend corroborates Karolyi's (2004) observation that the number of internationally cross-listed stocks declined by over 50% from 1997 to 2002. However, this reduction in the number of cross-listed stocks occurs during a period when the total number of listed stocks drops significantly in developed markets. Between 1998 and 2003, the number of corporations listed on an American stock exchange decreased from 12,447 to 9,758, according to data available from the World Federation of Exchanges, and the number of companies listed in Canada decreased from 4,431 to 3,630. Mergers and delistings can thus explain some of the disappearing cross-listings.

We carefully analyze each of the Canadian firms that delisted from the U.S. between the beginning of 1990 and the end of 2005, to determine why they disappear from this market. We were able to determine the reasons in 341 of the 355 reported cases. Table 2 summarizes our observations. Several companies disappeared following a bankruptcy or transaction to become private. In addition, eight Canadian companies were reorganized into an income trust, and NASDAQ does not list trust units.¹¹ This group of delisted companies is composed of 54 observations.

The most common reason that companies lose their interlisted status is mergers or acquisitions. We found that 173 companies (49% of the disappearing companies) are acquired or merged. We consider that the Canadian companies acquired by a foreign company are absorbed by the foreign market. We added to these observations those of the firms that delisted from the TSX, yet have kept their listing in the U.S., often following a change in the location of the headquarters. 100 companies are thus absorbed during this period.

Several interlisted companies merged with cross-listed Canadian companies. These 37 (10%) observations are considered to retain their cross-listed status. This is also the case for 41 Canadian companies that delist from NASDAQ but are still traded over-the counter (O.T.C.) and in Canada. This group of shadow interlisted companies comprises 78 observations.

The flow-back group consists of 109 companies. The majority of them retreat following an acquisition by a Canadian-listed company (63 cases). A sub-sample of 46 companies chooses to

delist from the U.S. Their motivations cannot be clarified in each case, but we observe the following patterns: 1) the proportion of trades in the U.S. is very low, and probably does not justify the burden of U.S. listing. The median proportion of U.S. trades for these 46 stocks is 0.75 for the month before the delisting from the U.S., and the average transaction volume is low,¹² 2) the company fails to comply with NASDAQ requirements, 3) some companies sell their operations in the U.S. or create a subsidiary in charge of these operations, which becomes listed in the U.S. The first observation is consistent with the cost-benefits analysis of a foreign listing. When a company fails to attract foreign investors, the costs of the cross-listing outpace the potential benefits. This observation is in line with the strategic motive for a foreign listing.

In essence, the reduction in the number of cross-listed Canadian firms is more perceived than real. In December 1989, 127 Canadian companies were interlisted, and 421 listed in the U.S. during the 1990-2006 period. Of these 548 companies, approximately 20% (109) retreated to Canada, mainly because they were acquired by a Canadian company. We do not observe the generalized flow-back phenomenon reported for the European cross-listed securities, and this phenomenon seems to be limited to small capitalized firms that fail to attract U.S. investors. The U.S. market absorbs a large number of the cross-listed firms, generally by way of a merger or acquisition by a U.S.-listed corporation. A few companies delisted from the Canadian market and a significant proportion transferred to the O.T.C., because they no longer comply with the listing requirements of major exchanges. Going private and bankruptcy account for 13% of the 355 disappearing companies. While a statistical test cannot be performed due to the nature of the data, our observations are consistent with proposition 2, which states that the U.S. markets are attractive for Canadian companies. In the last section of this paper, we attempt to analyze the way the distribution of trading between the two markets changes over time.

2.4. The Attraction of the American Market for Canadian Securities

We first analyze the changes in the distribution of trades between the two markets, for the population of interlisted securities. Then we analyze the changes by size and activity characteristics.

2.4.1. The distribution of trades between U.S. and Canada: a global analysis

Table 3 illustrates the changes in the distribution of the transactions between the two markets, for all the interlisted Canadian securities, according to the markets where the trades took place. The percentage of trading volume that took place outside Canada increased sharply from 1998 to 2000, a year in which only 45.9% of trades of interlisted securities occurred in Canada. The TSX then appeared to regain ground: in 2003, the Canadian proportion was 59.9%, but the proportion decreased sharply again in 2004 and 2005 (46.9% and 49.2%). The 2000 to 2003 variations seem to be largely associated with the crash of technology stocks, which were subsequently abandoned by American investors. Collectively, three stocks (Nortel, BCE and Corel) triggered a decline in trading volume in the U.S. equal to \$350 billion.¹³ The proportion of interlisted Canadian securities traded mainly on foreign exchanges rose from 28% in 1990 (40/143) to 54.71% in 2006 (122/223). In 1990, interlisted Canadian stocks were mainly securities whose trading value was less than \$100 million (55.24%). In 2006, the proportion of interlisted Canadian stocks whose trading value was less than \$100 million decreased sharply to 22.87%. In 2006, 47.98% of the interlisted Canadian stocks were securities with trading values higher than \$1 billion, as opposed to 17.48% in 1990.

Table 4 presents the results of the tests of the hypothesis that the distribution of trades is the same at the beginning and the end of the period. We restrict the sample to the main stock of companies interlisted in December 2006. When a company was not cross-listed in 1990, we consider that the proportion of Canadian trade is 100%. In 1990, 88.60% of interlisted securities were traded primarily in Canada, with more than 80% of trading realized in this country. The proportion fell to 16.58% in 2006. Conversely, the proportion of interlisted stocks traded predominantly in the U.S. (40% or higher) surged from 4.66% to 66.32% during the same period. We can reject the hypothesis that the distribution of interlisted stocks following the split of trading between the two markets was the same in 1990 and 2006. On the contrary, the increase in the U.S. portion of trade is strong and statistically significant.

2.4.2. Detailed analysis of the changes in trading patterns

The global analysis presented above masks large variations pertaining to securities. Indeed, previous research documents significant cross-sectional variation in the volume of transactions

following listing in a foreign market (Halling *et al.*, 2006). Moreover, the fact that some companies list several securities can distort the results. For each company we select the main security traded in the U.S. We then calculate the variation in the proportion of the Canadian trades over time. The following rules apply. When the security is traded in January 1990, the proportion of Canadian trades is obtained from the TSX Review. This initial proportion is 100% when the securities list abroad during the period of analysis. The final proportion is that of December 2006, as reported in the Review. This proportion is set to 0 when the company was absorbed by the U.S. market, to 100 when it returned to a Canadian listing, and to the proportion of the buying company following an acquisition by a cross-listed Canadian company. The proportion of Canadian trades is 100% even when the stock is still listed on the OTCBB. Companies that failed and went private and trusts are omitted from this stage of the analysis. The reported variable, VCP (Variation in Canadian Proportion), is calculated as the ending proportion of Canadian trades minus the beginning proportion of Canadian trades. We obtain a null variation when the company lists during the period (100% of Canadian trades at beginning) then retreats to Canada or is acquired by a Canadian firm.

In the first column of table 5, we report the distribution of the changes in the Canadian proportion of the trades, for the 480 securities. During the period, the proportion of Canadian trade increases for 55 of the cross-listed securities (11.46% of the observations). The increase in the U.S. proportion of transactions is greater than 80% in 125 cases (26.04% of the observations). Overall, we observe a strong trend toward an increase in the trades concluded in the U.S., but the changes in the volume of transactions following the cross-listing exhibits strong cross-sectional variations. We split the sample by size, estimated by the total volume of transactions (in dollars) and by sector, and replicated the analysis. The Canadian gains in the proportion of transactions are mainly observed in the small capitalization firms (20%, and 33.13% for the “no change” category) while the U.S. gains are realized among the firms that exhibit large or medium transaction volumes. The U.S. proportion of trading increased for 81.26% of the securities of the high volume group. The distributions of the three groups are statistically significant, according to a Chi-square test. Moreover, the hypothesis that the Canadian market retains its proportion of trades can be rejected. When the sample is divided by industrial sector, the U.S. market appears to capture a growing proportion of the trades in each sector, but the increase in the Canadian proportion of trades is more common in the resource sector. The distributions are statistically

different and the hypothesis of a gain in the U.S. market relative to the Canadian market can be accepted at the 0.005 level of significance.

These results are in line with proposition 3, which asserts that the proportion of foreign trade of Canadian interlisted stocks increases significantly over time. Both the increase in the number and proportion of interlisted stocks and the decrease in the Canadian portion of trading of these securities are consistent with the hollowing out hypothesis. From a Canadian point of view, the decrease in Canadian issuers listed only in the U.S. can be seen as a positive trend. Freedman and Engert (2003) illustrate that the number of Canadian issuers listed solely in the U.S. declined from 65 in 1995 to approximately 28 in 2002. According to the TSX, the number of Canadian firms listed in the U.S. exclusively decreased from 49 in 1997 to 35 in 2001. This decrease is due primarily to delistings and mergers (TSX Group Inc. final prospectus, 2002: 18),¹ and cannot be associated with a “return home” of these issuers.

2.4.3. Foreign issuers on the Canadian stock market

For a more thorough analysis, we also examined the changes in foreign listings in Canada. The value of worldwide trading of interlisted foreign securities increased between 1990 and 1998, reflecting the presence of several large-cap securities such as General Motors, Sony and Philips Petroleum. The trading value decreased considerably in 1999, mainly because of the withdrawal of Mobil Corp and Citicorp from the Canadian market. The number of interlisted foreign securities decreased sharply, from 54 in 1990 to 20 in 2006. In 1990, the number of foreign interlisted stocks divided by the number of listed Canadian stocks is 4.53% (54/1193), versus a proportion of 1.25% (20/1598) in 2006. However, the Canadian volume of trades executed for foreign securities listed in Canada is non-significant. In 2006, 20 foreign corporations were listed on both a foreign and a Canadian stock exchange, yet only two securities are traded at a rate of over 50% in Canada (Aberdeen Asia-Pacific and Solitario Resources). For 7 of the 20 stocks, Canadian volume represents less than 1% of total trading volume. The presence of foreign corporations on the Canadian market is symbolic—more than 96.5% of the value of trades in these securities is generated outside the Canadian market. By comparison, interlisted foreign

¹ <http://www.sedar.com>

securities represent approximately 10% of the trading volume on the NYSE (Boisvert and Gaa, 2002: 23) and more than 900 foreign securities are listed on the NYSE and NASDAQ. In 2005, the Swiss market had 116 listings of foreign securities, London 334, Luxembourg 197 and Singapore 122, according to data from the World Federation of Stock Exchanges. Therefore, Canadian markets have practically abandoned trading in foreign securities.

2.4.4. The global picture

The consequence of the gravitation of trades to the U.S. market is illustrated in table 6, for 1990 and 2006. For each of the 13 more active markets in 1990, we report the annual growth rate in trade volume, and the volume and rank in 2006. The relative position of the Canadian market is deteriorating: it dropped to 11th place in 2006, from 8th place 16 years earlier. The Canadian stock market has been surpassed by those of Italy, Spain and Korea.

We estimate the annual growth in trading values for each market. However, comparing growth makes sense only for firms of comparable size. In the group of the largest markets (more than \$US170 billion in 1990) growth is around 20% (the U.S.) or 21.5% (Euronext). Japan lags at 9%. Among the smaller markets (in 1990) Canada ranks 6 out of 8, very close to Australia (21.8 vs. 21.1). Canada is thus progressively losing strength relative to other markets. Stock market growth is fuelled by internal factors, but may also be triggered by the issue of securities by corporations or, on the contrary, may be weakened by the transfer of local securities trading to other markets. The loss of relative position of the Canadian stock market is essentially due to the transfer to the U.S. of a large part of the trading of cross-listed securities. For example, the TSX reports a U.S. trade volume on Canadian interlisted securities of US\$719 billion in 2006. If these trades had been made in Canada, Canada would have posted the 6th highest trading volume among the markets analyzed rather than the 11th highest. The loss of a significant and growing part of trade to the more advantageous U.S. market is thus the main challenge for the Canadian securities market.

3. Conclusions and Implications

This paper illustrates the challenges faced by well established but small stock markets that contend with giants like the U.S. markets and NYSE Euronext. Each year, between 20 and 30

Canadian companies list abroad for the first time. Of this number, 20% eventually return to Canada. The cross-listed companies that retreat to Canada are largely the least capitalized, whose stocks fail to attract many U.S. investors. Other firms are absorbed by the U.S. market, by merger or by delisting from Canada. Another group disappeared from the records, but is still listed in the U.S., outside of the main markets. The attractiveness of the U.S. market is thus omnipresent for Canadian firms. We document that the U.S. markets captured a growing proportion of the trades in Canadian interlisted companies' securities, and the Canadian markets lost their portion of trade for a large majority of interlisted securities. Around half of the trades were executed outside Canada. The proportion of trades of foreign securities conducted in Canada has become non-significant, and it is difficult to consider these stocks in the Canadian capitalization. Our conclusion approximates that of Gaa *et al.* (2001:31), who maintain that: "the direction of change is towards a single global market through the interlinkage of national equity markets. Domestic intermediated markets would be undermined by this development, since the standardized products traded on those markets could be traded more efficiently and at lower cost on the global matching market. The domestic intermediated market would continue to exist, since there will always be relatively illiquid products and agents desiring to trade them."

Our observations and tests show that the optimistic view of the Canadian securities market trends is not borne out by an in-depth analysis of the various indicators of the attractiveness of the Canadian market. Our conclusions thus differ from the optimistic opinions of the Canadian stock market. The observation of several acquisitions of interlisted companies by foreign firms is consistent with the hypothesis that companies list abroad to increase their value and to join competitors and markets. Such strategic arguments for cross-listing are not linked to the quality of the market, and there is little policy makers can do to limit this effect. Indeed, we have probably observed one of the collateral effects of the promotion of international exporting by the Canadian and provincial governments. The transfer of large trades to the U.S. is consistent with the advantages of listing and trading abroad, and is probably linked to a better (real or perceived) quality of the U.S. market.

Galper (1999) defines three business models for stock exchanges in the 2000s. A global exchange (GEX. p. 6) "dominates an economically linked community of several financial jurisdictions. It has the largest market capitalization in that community and the greatest trading

volume and liquidity of any of its direct competitors. It trades both highly visible international securities and derivative products (...). It draws its clientele from a pool of both domestic and global investors.” The TSX at least partially meets the criteria of a GEX, but bears a closer resemblance to a regional market (p.8), defined as follows: “the Regional Exchange dominates its local economy. It has the greatest concentration of regional listings available and is the chief expert in these listings. By virtue of its intense national concentration, its index becomes a barometer of the health of the publicly quoted part of the regional economy. It may trade securities and derivative products. It draws its clientele primarily from regional investors, with a smaller share of international investors interested in benefiting from the available expertise and opportunities.”

The TSX Venture Exchange is clearly what Schulman (1999) defines as a *Small and Medium Business Market* (SMB), a category that also encompasses NASDAQ. To the extent that Canada has less than 600 corporations capable of being listed and traded on NASDAQ, the TSX should also fall in this category. The implications are significant in terms of development strategy. According to Schulman (1999: 14), the main element to consider for SMB exchanges is location: “an exchange provides a real estate function for companies in the sense that it is where companies locate their stock listings and it is where customers (investors) come to buy and sell that stock. Therefore, to enhance the profile of an SMB market, exchanges should create attractive SMB market communities with financial influence, recognized value, and uniquely beneficial services.” Since several large-cap securities are moving to the American stock exchanges, it seems inevitable that the Canadian exchange will increasingly become an exchange of medium and small businesses, as defined by international standards.

In terms of public policy, more attention should be devoted to forging strategic alliances. In the Asia Pacific Area, development of financial centers and their stock market component appears to be a major concern in several countries. According to Kaufman (2001), this may not be an opportune time for emerging economies to allocate public resources to developing an IFC. We reinforce this point of view by showing that even well established and full-fledged stock markets find it very difficult to maintain their activities, notably the trading of the most liquid and capitalized stocks. If Canada is progressively losing market share to the U.S., one can be skeptical about the likelihood of smaller and less organized markets’ successfully developing

strong and lucrative stock markets. Like Canada, these countries should implement an effective mutual recognition system and forge strategic alliances. Moreover, like Canada, Asia Pacific countries should study in particular the way small and medium-sized enterprises, which represent the largest proportion of their securities market, are listed, regulated and traded. This is probably the true challenge markets in smaller countries must face if they wish to survive.

Table 1. Annual distribution of Canadian companies listed on both a Canadian stock exchange and a foreign stock exchange (mainly an American stock exchange) between 1990 and 2006

Year	# of cross-listed securities	value traded in millions of \$	# of companies in December	newly cross-listed companies	formerly cross-listed companies	net change
1989	-	-	127	-	-	-
1990	143	68,540	132	12	7	5
1991	139	59,115	119	8	21	-13
1992	137	68,019	121	16	14	2
1993	157	149,760	136	23	8	15
1994	172	199,014	154	32	14	18
1995	200	249,886	169	30	15	15
1996	222	334,304	190	36	15	21
1997	243	411,477	208	28	10	18
1998	244	490,663	213	36	31	5
1999	222	566,331	195	29	47	-18
2000	237	1,280,983	216	49	28	21
2001	213	805,399	190	24	50	-26
2002	194	665,373	177	12	25	-13
2003	184	704,683	179	17	15	2
2004	230	1,136,106	186	19	12	7
2005	252	1,301,894	196	26	16	10
2006	223	1,682,618	193	24	27	-3
Total	-	-	-	421	355	66

Source: Toronto Stock Exchange Review, January 1990 to December 2006.

Table 2. Analysis of the reasons that 355 Canadian companies are cross-listed between 1990 and 2006, but are no longer cross-listed in December 2006

	1990-2006 #	1990-2006 %	Code
Merger or acquisition	173	48.73	
With or by another Canadian interlisted company	37	10.42	I
With or by a foreign company	73	20.56	A
With or by a Canadian company	63	17.75	B
Securities are traded on an American O.T.C. market	41	11.55	I
Bankruptcy	35	9.86	NL
Privatization	11	3.10	NL
Reorganization into an Income Trust	8	2.25	NL
Delisted from the foreign stock exchange	46	12.96	B
Delisted from the TSX, but still listed in the US	27	7.61	A
Information not available	14	3.94	
Total	355	100.00	
Summary by code when information is available			
No longer listed, in either the U.S. or Canada (NL)	54	15.84	NL
Interlisted, but not on the lists (I)	78	22.87	I
Absorbed by the foreign market (A)	100	29.33	A
Back to Canada (B)	109	31.96	B

Sources: TSX review, January 1990 to December 2006, FPinfomart.ca, Sedar, www.otcbb.com, www.pinksheets.com, Google and Copernic software.

Table 3. Annual distribution by number and value of Canadian stocks traded in the U.S. and geographical breakdown of trades

Yearly	Securities whose trading value is				Traded elsewhere ^b			% Traded in Canada ^a	
	< \$100 million ^c		>= \$1,000 Million ^c		Total in %	# < 1%	# > 50%		
	#	%	#	%					
1990	143	79	55.24	25	17.48	45.3	8	40	54.7
1991	139	75	53.96	26	18.71	39.6	6	35	60.4
1992	137	61	44.53	33	24.09	40.2	7	30	59.8
1993	157	58	36.94	42	26.75	54.1	12	46	45.9
1994	172	65	37.79	53	30.81	50.7	15	57	49.3
1995	200	71	35.50	64	32.00	45.3	27	74	54.7
1996	222	66	29.73	77	34.68	42.2	20	81	57.8
1997	243	74	30.45	75	30.86	35.4	24	85	64.6
1998	244	82	33.61	81	33.20	34.8	19	93	65.2
1999	222	88	39.64	68	30.63	42.1	18	74	57.9
2000	237	73	30.80	83	35.02	54.1	32	89	45.9
2001	213	78	36.62	76	35.68	46.7	19	77	53.3
2002	194	51	26.29	75	38.66	38.8	6	73	61.2
2003	184	38	20.65	87	47.28	40.1	0	81	59.9
2004	230	61	26.52	104	45.22	53.1	25	101	46.9
2005	252	91	36.11	98	38.89	50.8	34	109	49.2
2006	223	51	22.87	107	47.98	48.4	5	122	51.6

Source: Toronto Stock Exchange Review, December 1990 to December 2006.

^a We present the percentages of the total value traded on all markets.

^b Certain securities show zero trading value: in 1990, Fahnestock II, in 1994, Currage Inc. and U. Dominion, in 1995, Currage Inc., in 1996, STN Inc., in 1997, Trizec Hahn and Moores Retail, and in 1998 Rea Gold and Tee-Com.

^c We deflate the limits of CAN\$100 million and CAN\$1,000 million starting on December 31, 2003 using the Canadian stock market index from DataStream

Table 4. Chi-square test of the null hypothesis: the proportion of interlisted Canadian stocks traded in Canada is the same in January 1990 as in December 2006. The sample is restricted to the main stock of Canadian companies cross-listed in December 2006

	Proportion of trades concluded in Canada					
	% <20	20<%<40	40<%<60	60<%<80	%>80	Total
1990						
Number of stocks	1	3	5	13	171	193
Relative frequency (%)	0.52	1.55	2.59	6.74	88.60	100.00
2006						
Number of stocks	33	57	38	33	32	193
Relative frequency (%)	17.1	29.53	19.69	17.10	16.58	100.00
					Chi- Square	207.92

Source: Toronto Stock Exchange Review, January 1990 and December 2006.

Table 5. Distribution of the variation in Canadian proportion of trades (VCP) of the main securities of Canadian companies listed on both a Canadian stock exchange and a foreign stock exchange (mainly an American stock exchange) between 1990 and 2006. Chi-square test of the null hypothesis: the proportion of VCP is independent of the volume. Chi-square test of the null hypothesis: the proportion of VCP is independent of the industry.

	Total				Volume				Industry			
	low		mean		high		Resource		High tech		Other	
	#	%	#	%	#	%	#	%	#	%	#	%
VCP >= 20	32	6.67	24	15.00	5	3.13	3	1.88	24	11.82	2	1.64
0 < VCP < 20	23	4.79	8	5.00	7	4.38	8	5.00	15	7.39	3	2.46
VCP = 0	109	22.71	53	33.13	37	23.13	19	11.88	39	19.21	36	29.51
-20 <= VCP < 0	41	8.54	4	2.50	12	7.50	25	15.63	6	2.96	14	11.48
-40 <= VCP < -20	37	7.71	8	5.00	11	6.88	18	11.25	22	10.84	5	4.10
-60 <= VCP < -40	49	10.21	11	6.88	18	11.25	20	12.50	27	13.30	9	7.38
-80 <= VCP < -60	64	13.33	13	8.13	18	11.25	33	20.63	33	16.26	12	9.84
VCP < -80	125	26.04	39	24.38	52	32.50	34	21.25	37	18.23	41	33.61
Total	480	100	160	100.00	160	100.00	160	100.00	203	100.00	122	100.00
Chi Square					78.95***				55.79***			

*** Significant at 0.005. VCP is the difference between the proportion of Canadian trades at the end of 2006 (or when the security is no longer cross-listed) and the proportion of Canadian trades at the beginning of 1990 (or when the security becomes interlisted) in percentage points. VCP = 20 means that the proportion of Canadian trades is, for example, 40% in 1990 and 60% in 2006. The volumes have been classified according to the terciles of the distribution of the mean total volume of each security over the whole period. Industries have been classified based on SIC codes. We used the total sample of the main stock of Canadian interlisted companies (548), except for the bankrupt companies (35), companies reorganized under an income trust (8), privatized companies (11) and companies for which the information was lacking (14).

Sources: TSX review, January 1990 to December 2006, FPinfomart.ca, Sedar, www.otcbb.com, www.pinksheets.com, Google and Copernic software.

Table 6. Ranking of sampled countries and trading volume in US\$ billion at the end of 1990 and 2006

	1990 value traded	2006		Annual
	Rank	Value traded	Rank	growth
U.S : NYSE, NASDAQ, AMEX	1,815.5	1	34,199.3	1
Tokyo & Osaka SE	1,531.5	2	6,074.2	3
London SE	543.4	3	7,571.7	2
Deutsche Börse ^a	508.7	4	2,737.2	5
Euronext ^b	171.0	5	3,853.3	4
Korea Exchange	75.6	6	1,342.1	10
Swiss Exchange ^c	69.0	7	1,396.5	8
TSX Group	54.8	8	1,281.8	11
Borsa Italiana	42.2	9	1,581.2	7
BME Spanish Exch.	41.0	10	1,933.8	6
Australian SE	40.2	11	859.6	12
Hong Kong Exch.	34.7	12	832.4	13
OMX ^d	31.13	13	1,332.4	9
	4,958.7		64,995.5	

^a Data for Germany are not comparable between 1990 and 2006. The method of recording volume was changed in 1997 to eliminate partial double-counting of trades (Emerging Market Fact Book 2001: 37).

^b We estimate the 1990 trading value for Euronext by summing the values reported by Amsterdam, Brussels and Paris Stock exchanges.

^c Data reported for 1990 are for 1991 since the 1990 data are unavailable.

^d OMX Copenhagen, OMX Helsinki and OMX Stockholm have integrated OMX in 2005; we summed the trading values of these three stock exchanges to obtain the reported value for 1990.

Source: Statistical data available online from the World Federation of Exchange web site (1990-2005) and WFE Annual report 2007.

Endnotes

¹ As underlined by Zhao (2003) and Laurenceson and Tang (2005), Toronto has overtaken Montreal as a financial center.

² Recently, a task force was implemented, whose mission was “the modernization of securities legislation in Canada and the enhancement of the competitiveness of Canada’s capital markets”. The report’s recommendations and research documents of this group are available at <http://www.tfmsl.ca/index.htm>

³ This hypothesis can be ruled out for Canadian firms. There is multiple evidence of a great similarity in the cost of equity in both countries, at the aggregate level (Hail and Leuz, 2006) and at the industry level (He and Kryzanowski, 2007). The second hypothesis, which refers to the bonding effect, seems to reflect the fact that CLP is not observed when firms list on the less heavily regulated markets of London, as evidenced by Doidge *et al.*

⁴ They measured both the posted bid-ask spread and the effective spread, and took into account the factors influencing the spreads, such as the price level, size and trading volume. The effective spread is the difference (in absolute value) between the price of the trade and the middle of the range

⁵ The MJDS is a joint initiative of the CSA and the SEC. Canadian issuers with market capitalization of at least \$75 million may use their home disclosure documents rather than undertake the more detailed U.S. filing, except in the case of an initial public offering.

⁶ Several other effects are expected, mainly in terms of depth of quote, which is the quantity of stocks that the dealers are ready to sell (or buy) at the quoted price. We deliberately limit the discussion to the effects on transaction costs and volume.

⁷ SEDAR is the Canadian equivalent of EDGAR

⁸ USF are a global range of standardized futures contracts on the shares of individual companies, traded on the Euronext.liffe, regardless of the location of the market of the underlying shares. 22 USF are listed in 2004.

⁹ We consider first cross-listings exclusively. Several companies list on another foreign market following their listing in the U.S. We do not analyze these situations. Since the creation of the London Alternative Investment Market (AIM) in 1995, 44 Canadian companies list on this exchange. We do not consider these cases, given that our objective is to assess the Canada-U.S. competition.

¹⁰ See Nicholls (2006) for a detailed description of the Canadian stock markets.

¹¹ Income Trust rules limit the number of non-resident stockholders.

¹² The median trading value in this category is \$674,000 per month. This is lower than the 10th percentile of the distribution of the average monthly trading value for the population (\$717,158). The companies in this group are thus among the least traded. The explanations of the CEO of FNX mining is a clear

illustration of the cross delisting reasons (SEDAR, May 23, 2006): “FNX Mining listed on AMEX in June 2003 to increase the Company’s United States retail trading volume and to attract American analyst coverage. Neither objective was achieved and our American institutional shareholders continue to trade on the Toronto Stock Exchange. In addition, the complexity of securities regulatory compliance in the United States and the administrative burdens and increasing costs associated with being a United States reporting company have significantly increased in the past few years, particularly in light of new SEC Sarbanes-Oxley requirements. Overall, these complexities and administrative burdens and their associated costs far outweigh any benefits derived from our AMEX listing.”

¹³ Nortel represented \$508.3 billion of trades in 2000, 65.7% of which took place in the U.S. Trades rose to \$41.9 billion in 2002, 51.2% of which were in the U.S. BCE dropped from \$96.8 billion and 25.5% of U.S. trades to \$25.5 billion and 12.6%. Corel went from \$9.1 billion and 88.5% of U.S. trades to \$194 million and 58.1%.

References

- Ahn, H.-J., C. Q. Cao and H. Choe (1998). "Decimalization and competition among stock markets: Evidence from the Toronto Stock Exchange cross-listed securities." *Journal of Financial Markets*, 1, 1, 51-87.
- Ammer, J. M., S. B. Holland, D. C. Smith and Francis E. Warnock (2005). Look at Me Now: What Attracts U.S. Shareholders? Board of Governors of the Federal Reserve System International Finance Discussion Paper No. 815 <http://ssrn.com/abstract=556208>
- Bancel, F. and C. R. Mittoo (2001). "European Managerial Perceptions of the Net Benefits of Foreign Stock Listings." *European Financial Management*, 7, 2, 213-236.
- Baruch, S., A. Karolyi and M. L. Lemmon (2007). "Multi-Market Trading and Liquidity: Theory and Evidence." *The Journal of Finance*, 62, 5, 2169-2220.
- Boisvert, S. and C. Gaa (2001). "Innovation and Competition in Canadian Equity Markets." *Bank of Canada Review*, Summer, 15-30.
- Carpentier, C., J.-F. L'Her and J.-M. Suret (2007). Is the Long-Run Performance of Cross-Listed Firms Anomalous? Working Paper
- Chowdhry, B. and V. Nanda (1991). "Multimarket Trading and Market Liquidity." *Review of Financial Studies*, 4, 3, 483-511.
- Chung, R., L. Kryzanowski and H. Zhang (1996). "Decimalization's Winner and Losers." *Canadian Investment Review*, Winter 1996/97, 35-39.
- Claessens, S., D. Klingebiel and S. L. Schmukler (2002). Explaining the Migration of Stocks from Exchanges in Emerging Economies to International Centres. Policy Research Working Paper Centre for Economic Policy Research World Bank Available at SSRN: <http://ssrn.com/abstract=296960>
- Cleary, S., K. Ker and J. Schmitz (2002). "Transaction Costs for TSE Listed Stocks." *Canadian Investment Review*, Spring, 20-26.
- Coffee, J. C. (2002). "Racing Towards The Top?: The Impact of Cross-listing and Stock Market Competition On International Corporate Governance." *Columbia Law Review*, 102, 7, 1757-1832.
- Cybo-Ottone, A., C. DiNoia and M. Murgia (2000). "Recent Development in the Structure of Securities Markets." Brookings-Wharton Papers on Financial Services 2000: 223-282.

- de Brouwer, G. (2003). "Financial Markets, Institutions, and Integration in East Asia." *Asian Economic Papers*, 2, 1, 53-80.
- DiNoia, C. (2001). "Competition and Integration among Stock Exchanges in Europe: Network Effects, Implicit Mergers and Remote Access." *European Financial Management*, 7, 1, 39-72.
- Dodge, C., G. A. Karolyi and R. Stulz (2007). Has New York Become Less Competitive in Global Markets? Evaluating Foreign Listing Choices over Time. Fisher College of Business Working Paper No. 2007-03-012
- Domowitz, I., J. Glen and A. Madhavan (2001). "Liquidity, Volatility, and Equity Trading Costs Across Countries and Over Time." *International Finance*, 4, 2, 221-255.
- Eun, C. E. and S. Sabherwal (2003). "Cross-Border Listing and Price Discovery: Evidence from U.S. Listed Canadian Stocks." *The Journal of Finance*, 58, 2, 549-576.
- Ferrarini, G. A. (2002). Securities regulation and the Rise of Pan-European Securities Markets: An Overview. Capital Markets in the Age of the Euro. in G. Ferrarini K. J. Hopt and E. Wymeersch (eds.). The Hague, Kluwer Law International, 241-263.
- Foerster, S. R., K. G.A and D. Weiner (1999). "Capital - the Lure of U.S. Exchanges." *Ivey Business Journal*, 63-66.
- Foerster, S. R. and G. A. Karolyi (1998). "Multimarket Trading and Liquidity: A Transaction Data Analysis of Canada U.S. Interlisting." *Journal of International Financial Markets, Institution and Money*, 393-412.
- Freedman, C. and W. Engert (2003). "Financial Developments in Canada: Past Trends and Future Challenges." *Bank of Canada Review*, 3-13.
- Gaa, C., S. Lumpkin, R. Ogorodnik and P. Thurlow (2001). The Future Prospects for National Financial Markets and Trading Centres. Bank of Canada Working Paper 2001-10 36 p.
<http://www.bankofcanada.ca/en/res/wp/2001/wp01-10.html>
- Galper, J. (1999). Three Business Model for the Stock Exchange Industry. World Federation of Exchanges
<http://www.world-exchanges.org/index.asp?resolutionX=1280&resolutionY=1024>.
- Hail, L. and C. Leuz (2006). "International Differences in the Cost of Equity Capital: Do Legal Institutions and Securities Regulation Matter?" *Journal of Accounting Research*, 44, 3, 485-531.

- Halling, M., M. Pagano, O. Randl and J. Zechner (2006). Where is the Market? Evidence from Cross-Listings. Working Paper, CSEF <http://www.dise.unisa.it/WP/wp129.pdf>
- Harris, L. (1997). Decimalization: A Review of the Arguments and Evidence. Working Paper, University of Southern California
<http://www.rcf.usc.edu/~lharris/ACROBAT/decimal.pdf>
- He, Z. and L. Kryzanowski (2007). "Cost of equity for Canadian and U.S. sectors." *The North American Journal of Economics and Finance*, 18, 2, 215-229.
- Houston, C. O. and R. A. Jones (1999). "The Multijurisdictional Disclosure System: Model for Future Cooperation?" *Journal of International Financial Management and Accounting*, 10, 3, 227-248.
- Houston, C. O. and R. A. Jones (2002). "Canadian Manager Perceptions of the US Exchange Listings: Recent Evidence." *Journal of International Financial Management and Accounting*, 13, 2, 235-253.
- Jenkinson, T. and A. Ljungqvist (2001). Going Public: The theory and Evidence on How Companies Raise Equity Finance, Second edition. Oxford and New York: Oxford University Press.
- Karolyi, G. A. (1998). "Why Do Companies List Shares Abroad?: A Survey of the Evidence and its Managerial Implications." *Financial Markets, Institutions & Instruments*, 28, 1, 1-60.
- Karolyi, G. A. (2006). "The World of Cross-Listings and Cross-Listings of the World: Challenging Conventional Wisdom." *Review of Finance*, 10, 1, 99-152.
- Kaufman, G. G. (2001). "Emerging Economies and International Financial Centers." *Review of Pacific Basin Financial Markets & Policies*, 4, 4, 365-377.
- King, M. and D. Segal (2005). Are There Longer Horizon Benefits to Cross-Listing?: Untangling the Effects of Investor Recognition, Trading and Ownership. Working Paper, Bank of Canada http://www.wlu.ca/documents/11189/kingsegal_investorstrading051115.pdf
- King, M. and D. Segal (2007). "Market Segmentation and Equity Valuation: Comparing Canada and the United States." *Journal of International Financial Markets, Institutions and Money*, In Press.
- Lang, M. H., K. V. Lins and D. P. Miller (2003). "ADRs, Analysts, and Accuracy: Does Cross Listing in the United States Improve a Firm's Information Environment and Increase Market Value?" *Journal of Accounting Research*, 41, 2, 317-345.

- Laurenceson, J. and K. K. Tang (2005). "Shanghai's Development as an International Financial Center." *Review of Pacific Basin Financial Markets & Policies*, 8, 1, 147-166.
- Levine, R., N. Loayza and T. Beck (2000). "Financial Intermediation and Growth: Causality and Causes." *Journal of Monetary Economics*, 46, 1, 31-77.
- Levine, R. and S. L. Schmukler (2007). "Migration, spillovers, and trade diversion: The impact of internationalization on domestic stock market activity." *Journal of Banking & Finance*, 31, 6, 1595-1612.
- Licht, A. N. (2001). "David's Dilemma: A Case Study of Securities Regulation in a Small Open Market." *Theoretical Inquiries in Law*, 2, 2, 673-709.
- Marano, A. (2000). Beyond the London-Frankfurt Dichotomy: What Space for the Other European Financial centers. 40th Congress of the European Regional Science Association, Barcelona, Spain, <http://www.ersa.org/ersaconsf/ersa00/pdf-ersa/pdf/407.pdf>
- Mittoo, U. R. (2003). "Globalization and the value of US listing: Revisiting Canadian evidence." *Journal of Banking and Finance*, 27, 9, 1629-1661.
- Nicholls, C. (2006). The Characteristics of Canada's Capital Markets and the Illustrative Case of Canada's Legislative Regulatory Response to Sarbanes-Oxley Research Study Commissioned by the Task Force to Modernize Securities Legislation in Canada http://www.tfmsl.ca/docs/Volume4_en.pdf
- Oliver, J. J. (2002). The Changing Structure of Corporate Canada and Canadian Capital Markets. Presentation at the Financial Forum, Schulich School of Business, York University, http://www.ida.ca/Files/Media/RecSpeech/SchulichSchoolOfBusiness_en.pdf
- Oppenheimer, H. R. and S. Sabherwal (2003). "The Impact of U.S. Decimalization on Cross-listed Canadian Stocks." *Canadian Investment Review*, 16, 3, 39-45.
- Pagano, M., O. Randl, A. A. Roell and J. Zechner (2001). "What Makes Stock Exchanges Succeed? Evidence from Cross-listing Decisions." *European Economic Review*, 45, 4-6, 770-782.
- Portes, R. and H. Rey (2005). "The Determinants of Cross-border Equity Flows." *Journal of International Economics*, 65, 2, 269-296.
- Reguly, E. (1999). "Corporate Canada March South." The Globe and Mail Report on Business, December.

- Reguly, E. (2002). The Hollowing Out of Corporate Canada. Corporate Knight.ca
http://www.corporateknights.ca/stories/hollowing_out.asp
- Schulman, A. (1999). "Small and Medium Size Business Markets." World Federation of Stock Exchanges.
- Steil, B. (2002). "Building a Transatlantic Securities Market." International Securities Market Association. <http://www.isma.org/surveys/latest.html>.
- Wang, K. (2000). "Rationale and Strategy for Expansion of Singapore Stock Market." *Review of Pacific Basin Financial Markets & Policies*, 3, 1, 45-58.
- Zhao, S. X. B. (2003). "Spatial Restructuring of Financial Centers in Mainland China and Hong Kong : A Geography of Finance Perspective." *Urban Affairs Review*, 38, 4, 535-571.