

**THE VALUATION EFFECT OF LISTING STANDARDS:
AN ANALYSIS OF VENTURE CAPITAL-BACKED IPOs**

Cécile Carpentier*

Professor, Laval University and CIRANO Fellow
European Center for Corporate Control Studies
Faculty of Administrative Science
Pavilion Palasis-Prince
2325 de la Terrasse, Laval University
Québec (Québec) Canada
G1V 0A6
phone: 418 656 2131 #6385
fax: 418 656 7746
email: Cecile.Carpentier@fsa.ulaval.ca

Douglas Cumming

Associate Professor and Ontario Research Chair
York University - Schulich School of Business
4700 Keele Street
Toronto, Ontario M3J 1P3
Canada
phone: 416 736 2100 #77942
fax: 416 736 5687
email: dcumming@schulich.yorku.ca

Jean-Marc Suret*

Professor, Laval University and CIRANO Fellow
European Center for Corporate Control Studies
Faculty of Administrative Science
Pavilion Palasis-Prince
2325 de la Terrasse, Laval University
Québec (Québec) Canada
G1V 0A6
phone: 418 656 7134
fax: 418 656 7746
email: Jean-Marc.Suret@fsa.ulaval.ca

* Cécile Carpentier and Jean-Marc Suret thank the Fonds pour l'éducation et la saine gouvernance de l'Autorité des marchés financiers du Québec and the Social Sciences and Humanities Research Council (SSHRC) of Canada for financial support. The authors are grateful for very valuable research assistance from Nicolas Ros.

**THE VALUATION EFFECT OF LISTING STANDARDS:
AN ANALYSIS OF VENTURE CAPITAL-BACKED IPOs**

This Draft: February 15 2010

Abstract

This paper examines the valuation of venture capital (VC)-backed IPOs in Canada and the US over the 1986-2007 period. The data indicate that differences in listing standards between Canada and the US account for fact that IPOs are valued substantially lower in Canada. We consider alternative matched samples based on factors that include size, sector and expected liquidity, and consider several alternative explanations that might affect IPO valuations, including the quality of the issuer, VC and investment bank, as well as mispricing, liquidity, and clientele effects.

Keywords: Securities Regulation, Listing Standards, Valuation, Initial Public Offerings

JEL Classification: G24; G32; G14; G15

1. Introduction

IPO valuations are important for both well functioning stock markets and entrepreneurship markets. Exchanges that can facilitate high IPO valuations promote investor confidence, exchange liquidity, and attract the highest quality issuers (La Porta *et al.*, 2002; Aggarwal *et al.*, 2009). Likewise, high IPO valuations encourage entrepreneurs to start up new ventures, and make it worthwhile for investors in private entrepreneurial ventures to provide financing, as IPOs are arguably the most important form exit for entrepreneurs and investors alike in terms of motivating high levels of entrepreneurial activity (Black and Gilson, 1998).

In this paper, we create for the first time a matched sample of US and Canadian venture capital (VC)-backed IPOs based on offer year, industry and size, as well as consider robustness to matching on other dimensions such as expected liquidity and investment bank and VC quality. We show that for matched IPOs, average (median) valuations are roughly 18% (43%) lower in Canada than the US. In view of the pronounced impact this valuation difference can have on both the financing of privately held and publicly traded companies, such a large disparity in IPO valuations is of great concern to entrepreneurs, investors and policymakers alike. We consider a number of competing explanations for international differences in IPO valuations, including listing standards, liquidity, irrational pricing, issuer quality, and investment bank and venture capital (VC) quality.

Our focus on VC-backed IPOs is in part motivated by the fact that non-VC-backed IPOs in Canada are typically too small to be matched with IPOs in the US. By focusing on VC-backed IPOs we obtain as close as possible a suitable matching in the two countries based on size, year and industry. Our focus on VC-backed IPOs is also in part motivated by practitioner concerns, such as that posed by the Canadian Venture Capital Association (Duruflé, 2006), that the US offers superior exit opportunities than Canada due to higher IPO valuations, thereby worsening the entrepreneurial environment in Canada. Further, previous studies find evidence that the involvement of VCs influences several characteristics, including the valuation of IPOs (Chemmanur and Loutskina, 2006). Accordingly, we control for VC-backing when comparing IPO valuations in Canada and the US.

The data examined indicate that country effects give rise to lower IPO valuations in Canada by at least 31% and as much as 71% relative to IPO valuations in the US, depending on

the matched sample and control variables. For the subset of the Canadian and US data that only considers non-prestigious investment banks, IPO valuations are as much as 95% higher in the US. In view of the focused market segment examined, the most plausible explanation for these strong differences in valuations is the substantially lower listing standards in Canada. We note that we control for a variety of other competing explanations for the differences in valuations, and regardless of the controls considered, the differences are best explained by listing standards.

The findings in this paper highlight a principal role of stock exchange listing requirements to facilitate investing and trading of securities by ensuring a minimum level of firm quality, monitoring and governance. Minimum listing standards are therefore a signal of quality to market participants, which in turn facilitates liquidity by attracting investors to the market (Macey and O'Hara, 2002; Harris, 2006). The level of regulation in a stock market influences its cost of capital and the values of the firms listed on the different markets (La Porta *et al.*, 2002; Doidge *et al.*, 2004; Hail and Leuz, 2006).¹

Our findings complement and build on the literature on cross national studies of securities regulation and IPOs. The quality of securities regulation is similar in the US and in Canada (Hail and Leuz, 2006). King and Segal (2008) show that larger² publicly traded Canadian firms have lower valuations than their US counterparts based on multiples of market-to-book, price-to-last 12-month earnings, Tobin's q, and enterprise value-to-EBITDA, despite exhibiting higher sales growth and profitability. Hail and Leuz (2006) use earning forecasts to estimate the cost of capital, which requires restricting their sample to the largest Canadian companies which offer sufficient coverage by analysts and are typically cross-listed. Hail and Leuz estimate the cost of capital to be only slightly higher in Canada than the US, and as such find that all else being equal the implied valuations of matched companies is only 3% lower in Canada relative to the US.

While Hail and Leuz (2006) and King and Segal (2008) analyze a sample of medium and large firms which are generally profitable, in this paper we study small publicly traded firms,

¹ Standard setters frequently refer to the link between accounting information and firms' cost of capital. For example, Arthur Levitt, the former chairman of the Securities and Exchange Commission (SEC), suggests that "high quality accounting standards ... reduce capital costs" (Levitt, 1998 p. 81), and this view is supported by academic work (see Lambert *et al.*, 2007) Similarly, Neel Foster, a former member of the Financial Accounting Standards Board (FASB), claims that "More information always equates to less uncertainty, and people pay more for certainty. In the context of financial information, the end result is that better disclosure results in a lower cost of capital" (Foster, 2003 p.1).

² King and Segal (2008) reject from their sample companies with sales (or total assets) less than \$25 million. The median total asset is \$142 million and the median ROA is 3.7%.

generally unprofitable, at an early stage of development, without any significant analyst coverage, and with massive information asymmetry. The Canadian market is, for the most part, a penny stock market and IPOs firms are particularly small and at a development stage (Carpentier *et al.*, 2009). Our new evidence shows that listing standards have a much more pronounced impact on smaller firms: while large firms are valued 3% lower in Canada than the US (Hail and Leuz, 2006), we show in this paper that small firms are valued at least 30% lower in Canada.

This paper is organized as follows. Section 2 reviews potential alternative explanations for differences in valuations of VC-backed IPOs in Canada and the US and develops our main hypothesis. Section 3 introduces the data, matching process and stylized facts. Section 4 tests the proposition that the two subsets differs along quality, investors' rationality and post-IPO liquidity. Section 5 presents the econometric models, our multivariate regression results and robustness checks. Concluding remarks follow in Section 6.

2. Hypothesis development

First we consider how listing standards might explain differences in IPO valuations in Canada and the US. Second, we consider alternative explanations for international differences in IPO valuations.

2.1. Listing standards

Stock exchanges face a trade-off in deciding which firms should be eligible for a listing. On one hand, lower listing standards enable a greater number of companies to meet those standards, which in turn increases the exchange's listing revenues and associated fees. On the other hand, lower listing standards potentially reduce governance standards and reputational capital, which in turn lowers liquidity insofar as investors are dissuaded from participating in the market.

IPOs face strict regulation in the US. The rationale has been that the regulators are gatekeepers whose strict requirements protect investors, enhance market integrity and, in turn, reduce the cost of capital for listed firms. US regulations have become more stringent in recent years. For IPOs, the Penny Stock Reform Act (PSRA) of 1990 placed severe restrictions on IPOs that were priced below \$5 (Beatty and Kadiyala, 2003). When the SEC revised the Penny Stock Rule in 2005, the SEC required newly listed firms to have a positive net income, a market value

of listed securities of \$50 million and a minimum bid price of \$4 per share.³ Furthermore, the SEC also reinforced the disclosure requirements for stocks not listed on a national market. On January 4, 1999, the SEC approved the “eligibility rule”, which required all domestic over the counter bulletin board (OTCBB) firms to comply with the reporting obligations under the 1934 Act (Bushee and Leuz, 2005). The rationale underlying these recent US regulatory reforms has been challenged by the recent surge of less regulated markets, such as the AIM in London. The AIM has challenged the dominant situation of the US stock market. Healy and Palepu (2001 p.431) argue that the comparative rise of the AIM subsequent to these US regulatory changes make further work on disclosure and capital market research worthwhile to assess the effect of regulation on capital market development.

Listing requirements do differ across Canada and the US (Harris, 2006). Unlike their counterparts in the US, Canadian regulators and exchanges have set minimal listing requirements so low that almost any firm can list via an IPO, even without revenues or earnings. One of the main Canadian stock markets, the TSX Venture (TSXV), describes itself as a “public venture market”. New firms can list with no revenues, the stock price should be higher than CAN\$0.15, and the minimal net tangible assets, including the IPO proceeds, has been set at CAN\$500,000 or \$750,000 depending on the period.⁴ More than half of Canadian IPOs comprise firms without revenues, which creates a situation in which there is very pronounced asymmetric information, risk and uncertainty faced by purchasers of newly listed firms. Moreover, because the IPO process is costly, and particularly costly relative to the capital raised for smaller firms, regulators have permitted access to the market via “backdoor listings”,⁵ including RMs and Capital Pool Companies (CPCs).⁶ The lax security regulatory regime prevailing in Canada allows firms to

³ See: <http://www.sec.gov/rules/final/34-51983.pdf>. See also Klein and Mohanram (2006). Other papers that evocate the regulation of IPOs in the US include Cox (2000) on reforming securities regulation and Cohn (1999) on the impact of securities law on small business.

⁴ Corresponding values for NASDAQ from June 1999 to June 2001 were US\$4 (price), US\$4 million for shareholders' equity, and US\$5 million for market capitalization.

⁵ According to the TSX Manual, a "backdoor listing" occurs when an issuance of securities of a listed issuer results, directly or indirectly, in the acquisition of the listed issuer by an unlisted issuer with an accompanying change in effective control of the listed issuer. A transaction giving rise to a backdoor listing may take one of a number of forms, including an issuance of securities for assets, an amalgamation or a merger. Transactions will normally be regarded as backdoor listings if they could result in the security holders of the listed issuer's owning less than 50% of the securities or voting power of the resulting issuer, with an accompanying change in effective control of the listed issuer.

⁶ CPCs are similar to Special Purpose Acquisition Companies (SPAC) in the US, but they involve much smaller amount of money. A CPC is a listed corporation (a shell) with no assets (except cash), no business plan and no

choose to list via a RMs or an IPOs. The result of these low regulatory requirements is a market where most of the Canadian listed firms can be considered as micro or small stocks firm. Carpentier *et al.* (2009) report that 3,857 new companies listed on the TSXV from 1986 to 2006, which is equal to 60% of the number of IPOs reported in the US during the same period (see also Harris, 2006; Cumming and Johan, 2009). The entrants are characterized by the following three figures: 49.26% report no revenues, the pre-listing median shareholders' equity is CAN\$260,000, and the median gross proceeds are CAN\$650,000. These new listings are new business ventures, which are in fact penny stock IPOs. Their reported sales and assets are considerably lower than those of any junior market, including the London Alternative Investment Market (AIM).

Closely related to listing standards is the regulation of subsequent disclosure obligations. Disclosure regulation has been very similar in Canada and the US. The implementation of the Multijurisdictional Disclosure System (MJDS) in 1991, which allows Canadian issuers to meet their US filing requirements using Canadian disclosure documents illustrate the closeness between the disclosure rules in both countries. One notable difference stays in the implementation of Sarbanes Oxley legislation (June 2002) in the US. As such, in order to assess the effect of international differences in listing standards on IPO valuations, we necessarily control for Sarbanes Oxley. A second difference stands in the implementation of several elements of proportionate regulation for disclosure, for venture issuers.⁷ Proportionate regulation “*is the notion that securities regulation should recognize the different risks and benefits of issuers by their size, experience in the market, resources or capacity to act*” (Sarra, 2009, p. 12). Since the beginning of the 20s, junior issuers have been exempted from particular disclosure requirements like the annual information form and the critical accounting estimates of the management's discussion and analysis. These issuers now have more time to comply with periodic disclosure requirements and benefit from modified requirements in terms of details to disclose.⁸ Differences

operating history, and is solely intended to find and acquire assets or firms as takeover targets. Once the qualifying transaction (QT) is completed, the resulting issuer may be listed for regular trading (Carpentier and Suret, 2006).

⁷ A venture issuer is defined as a reporting issuer that does not have any of its securities listed or quoted on any exchange other than the TSXV, the Alternative Investment Market of the London Stock Exchange or the PLUS markets.

⁸ Venture issuers must file a business acquisition report if the size of the acquired business exceeds 40% of the size of the acquiring company (20% for non-ventures), and a venture issuer needs only to disclose one year of audited financial statements of the acquired firm. Non-venture issuers should disclose three years of financial statements. Venture issuers listed in British-Columbia are not required to file such a report. Sarra (2009) provides an analysis of the treatment of junior issuers in Canada, and a list of the regulatory differences between venture and non-venture issuers can be consulted on the Canadian Securities Administrators' website, at:

between regulation, including listing standard and disclosure, can indeed imply differences in cost of equity (Hail and Leuz, 2006). Several studies illustrated by Hail and Leuz, use valuation models to compare the cost of equity in several countries. Hail and Leuz evidence that regulation matters internationally, but conclude that the difference between the costs of equity in Canada and the US is very low based on data from large established companies (10.2% in the US versus 10.5% in Canada). Claus and Thomas (2001) evidence a lower cost of capital in Canada, and He and Kryzanowski (2007) conclude that there is no difference in costs of equity after taking into account industry controls. Witmer and Zorn (2007) evidence that the differences that prevailed before 1997 has vanished, thanks to the change in the interest rates in both countries. The overall conclusion is that, for large firms, there is no difference between the costs of capital in both countries. This can be traced to the lack of strong differences between the regulation applied to large Canadian and US companies and to the market integration that prevails at this level. Moreover, the Canadian and US stock markets for larger stocks are generally considered to be only partially integrated.⁹ As most of the estimation models rely on financial analysts forecasts, the previous studies focused on the main segments of both markets.

A parallel stream of research focused on the comparison of values of similar firms in both countries. King and Segal (2008) conclude that the Canadian and US markets are segmented. They establish this result by comparing the valuation multiples assigned to the equity of a sample of approximately 600 Canadian firms listed exclusively in the home market with a matched sample of US firms over the period 1989-2004. King and Segal conclude that Canadian firms have lower valuations based on multiples of market-to-book, price-to-last 12-month earnings, Tobin's q, and enterprise value-to-EBITDA. However, their results evidence also a strong effect of the firm's inclusion in the indexes in both countries. This effect overrides the country effect (Table 3). For example, the coefficient in the model that explains the price to earnings ratio is 2.303 for the country variable, but it is 4.894 for the variable associated with the Canadian index and 7.739 in the case of the variable indicating a firm included in the S&P 500. The valuation effect of the inclusion in the index is generally explained by the increased demand generated

<http://www.gov.ns.ca/nssc/docs/cdbrochure.pdf>

⁹ See Beaulieu *et al.* (2009) for a review and recent evidence of mild integration between US and Canadian market. Indeed, very few regulatory dispositions limit cross-border investment or listing. However, as foreign investors are generally not aware of newly listed companies and because the floats of these stocks are often too low to attract institutional investors, segmentation can exist between the higher and the lower segments of the markets (Elyasiani *et al.*, 2000).

from index funds or exchange-traded funds (Morck and Yang, 2001). Index funds in Canada generally follow the S&P TSX 60 while, in the US, several funds are indexed on the S&P 500. This implies that the relative weight on the index effect is probably larger in the US sample than in the Canadian sample. Our setting, which excludes firms included in the indexes, overcomes this problem.

Another stream of research on cost of capital is based on the cross-listing premium (CLP) concept. Companies that cross-list in the US benefit from a CLP: their value is higher than the value of similar companies that are not cross-listed. This premium exists for companies from all countries, and is not specific to Canada. On average, the CLP is estimated at between 17% and 22% (according to estimation methods) for a listing on a US exchange (Doidge *et al.*, 2004, p. 31). Several explanations have been proposed to explain this premium, including the bonding proposition: a company that is listed in the US subjects itself to a more stringent regulatory environment as well as to greater scrutiny by the authorities, analysts and institutional investors (Doidge *et al.*, 2004, p.3). However, the premium can also be linked to better possibilities for financing growth. Doidge *et al.* (2004) show that growth opportunities are more highly valued for firms that choose to cross-list in the US, particularly those from countries with poorer investor rights. Growth opportunities of these cross-listed firms are likely to be more valuable not only because the firms are better able to take advantage of them, but also because a smaller fraction of firm resources is expropriated by controlling shareholders in firms that find it optimal to list.

Recent papers, however, question the bonding explanation for the CLP and offer two alternative propositions. Litvak (2009) observes that the CLP is strongly correlated with US stock indexes for firms that list on major markets, but not for firms listed on cross-listed firms traded OTC or on PORTAL. Moreover, the CLP exists only in firms with above-median ratio of US to total trading volume, and declines significantly for firms with a low volume of trading. Litvak concludes that these results weaken the law-based explanation for cross-listing premia (bonding to US securities regime) and strengthen liquidity and visibility explanations. Litvak suggests a behavioral explanation that is important in our setting: US investors treat high trading volume, exchange traded firms partly like US firms, but treat OTC firm, PORTAL firms and low-trading-volume exchange-traded firms like other foreign firms. Sarkissian and Schill (2008) observe that cross-listing “waves”, that occur when the market does relatively well, are consistent with the recent literature. They find little evidence that overseas listing is associated with any appreciable

increase in the long-term valuation ratio of listing firms. They suggest that these short-term valuation gains surrounding cross-listing provide the impetus for listing overseas. In the same vein, Abdallah and Ioannidis (2009) evidence that before firms cross-list they exhibit strong performance in their domestic market, but after cross-listing their performance declines.

King and Segal (2008) find that cross-listed firms in the US with a single class of shares enjoy a permanent increase in valuation if they attract and maintain investor recognition over time. Valuations of firms that fail to widen their US shareholder base return to pre-listing levels within two years. Cross-listed firms with dual-class shares exhibit a permanent increase in valuation regardless of the level of US investor holdings, consistent with firm-level bonding. This seems to indicate that a US listing can increase the values of some categories of stocks. King and Segal (2008) and related studies, however, do not consider small companies which generally do not cross-list in the US. In our analyses, by contrast, we focus on substantially smaller stocks.

In sum, for large firms the extant evidence is such that there are comparatively small differences in the cost of capital due to Canada's regulatory structure. For smaller firms, however, there is no prior evidence. Our central hypothesis is as follow:

Given the pronounced differences in listing standards for smaller firms, Canadian IPOs are valued substantially lower than their US counterparts.

We test this hypothesis by considering differences across countries while at the same time controlling for alternative explanations. Several alternative explanations are examined below.

2.2. Alternative explanations for international differences in IPO valuation

In this section we briefly review a number of alternative explanations for international differences in IPO valuation, including liquidity, clientele effects, the quality of issuers, investment banker pricing rationality, and VC and investment bank reputation.

2.2.1. Liquidity

Investors price liquidity (Litvak, 2009). There is substantial evidence of a significant liquidity premium that is robust to the CAPM and the Fama-French three-factor model, and that liquidity is an important source of priced risk (Liu, 2006). In the private placement sector, there is strong evidence that liquidity influences the discount, which is the difference between the issue price and the market price (Maynes and Pandes, 2009). In an illiquid market, while quoted prices

exist, these prices have biases which reflect individual beliefs about the best and worst possible outcomes and are not averages across all possible outcomes. Investors heavily discount the value of securities that are not frequently traded (Easley and O'Hara, 2009). Differences in liquidity should be linked to the assumed differences in the future level of liquidity, and these levels can differ across the countries.

2.2.2. Clientele effects

IPOs are marketed and sold to institutional investors (Ljungqvist, 2007). It is possible that differences in the presence of institutional investors in Canada and the US reflect differences in IPO valuations. To consider this possibility, we compare the relative size of institutional investor assets over time in Canada versus the US to see whether the institutional clientele effects matter for IPO valuation. In our empirical tests below, we control for the relative importance of institutional investors in Canada and the US.

2.2.3. Better quality of issuers

It is possible that US VC-backed IPOs firms are of better quality than their Canadian counterparts. US VC-backed firms might have, for example, more R&D projects of better quality, better management teams or larger opportunity to implement strategic alliances. In such a context, higher IPO valuations in a country can reflect higher growth expectations and various characteristics of issuers that can be appreciated by investment bankers and investors. However, investors have few opportunities to assess the real quality of emerging firms with no sales or negative earnings at the time of listing.

2.2.4. Irrational pricing

An extensive literature address the pricing and underpricing of IPOs (Ljungqvist, 2007). Behavioral explanations can account for IPO pricing (Loughran and Ritter, 2002). Behavioural explanations are important in explaining international differences in IPO valuations to the extent that behavioural biases are different across countries. Individual and institutional investors can play different roles in the IPO markets in both countries. These two groups exhibit different levels of bias and knowledge during the IPOs. For example, Dorn (2009) indicates that retail investors overpay the stocks at the IPO and exhibit lower long run returns. According to Chiang *et al.* (2009) the bids of individual investors during auctioned IPOs exhibit evidence of return

chasing. The unexpected entry of more individual investors is related to lower returns. We cannot rule out the possibility that pricing differ in both countries because of differences in the rationality and information of the investors. If differences exist at this level, we should observe differences between underpricing and long run performance of IPOs, depending on the country.

2.2.5. Venture capital, investment bank and auditor reputation

Investment bank and auditor reputation can positively influence IPO valuation. Investment banks and auditors provide certification about the quality of the IPO firm to the new investors (Carter and Manaster, 1990; Ljungqvist, 2007). Similarly, VCs provide certification about the quality of the IPO firm to new investors as well as monitor the quality of the firm before the IPO and prior to their exit after the expiration of the restricted period. Further, VCs attract market power in terms of attracting a greater number and higher quality of market participants such as underwriters, institutional investors, and analysts to an IPO, thus obtaining a higher valuation for the IPOs of firms backed by them (Chemmanur and Loutskina, 2006). VC-backed firms have larger and more independent boards, and their monitoring shareholders own a higher percentage of the firm. Further, VC-backed firms have governance structures with higher levels of monitoring at the time of the IPO and four years following the offering (Manigart *et al.*, 2002; Baker and Gompers, 2003; Nahata, 2008; Suchard, 2009). Prior work is consistent with the view that Canadian VCs are of lower quality than US VCs, and this difference is attributable to government VC funds in Canada that have inferior governance structures (Cumming and Johan, 2009).

2.3. Summary and test strategy

Our main proposition is that given the pronounced differences in listing standards, Canadian IPOs are valued substantially lower than their US counterparts. Accordingly, our main test will be a valuation model where a dummy variable accounts for the country. To be able to reject alternative specifications, we also include in the model several variables that are observable at the IPO time. This is, for example, the case for the quality of investment bankers or VCs. However, this strategy cannot be used with each of the alternative explanations, because we do not have clear indicators of several variables at the IPO time. Mainly, the quality of issuers, possible irrational pricing, and future liquidity cannot be observed before the issue.

To cope with this problem we use a two-step strategy. First, we test the differences in quality, rationality and liquidity between the Canadian and US sub sample using ex-post data, in section 4. When we reject the hypothesis of significant difference along one dimension between both groups, the corresponding explanation for difference in valuation can be eliminated. Second, if significant difference between both groups appears for one or several dimensions, we develop an ex-ante indicator for this dimension and use this indicator in the main econometric model.¹⁰

3. Data, matching process and stylized facts

3.1. Sample selection

Our sample of matched VC-backed IPOs in Canada and the US spans the years 1986-2007. Our sample is derived from the list of Canadian IPOs from FPIInfomart.ca since 1993 and from the annual list of the Financial Post for the previous years. We excluded privatization of state-owned companies, demutualizations, creation of income trusts and Capital Pool Companies Program IPOs.¹¹ We obtained prospectuses from SEDAR (the Canadian equivalent of EDGAR) since 1997, and those of previous years from the Autorité des Marchés financiers du Québec, investment bankers and academic libraries. We supplemented the accounting information with historical records from Thomson's CanCorp Financials. Data sources and variable definitions are provided in the Appendix.

Because there is no exhaustive list of VC-backed IPO in Canada, we track the issuer with a VC involved in the company before the IPO. We obtained a partial list of VC-backed IPOs from Thomson Financial VC Reporter, a major provider of data on the VC industry. VC Reporter summarizes the deals made by the members of this industry in Canada. We supplemented and verified these data by analyzing the list of large shareholders in prospectuses.¹² The frequency of VC-backed IPOs in Canada is relatively low. Cumming and Johan (2009) report that the proportion of VC investment in Canada that exit through an IPO is 5.85%, from 1991 to 2004, compared to a proportion of 35.65% in the US during the same period. In our sample, we

¹⁰ Another option can be to develop ex-ante indicator for each of the dimensions, with the risk to develop highly correlated indicators.

¹¹ The Capital Pool Program has been implemented in Canada to ease the creation of shells, ultimately used in reverse merger listings by operating companies (Carpentier and Suret 2006). Their IPOs result in the listing of a non-operating company; we consequently exclude CPC IPOs from our sample.

¹² We compile a list of VCs operating in Canada from 1986 to 2003 from the lists of the Canadian VC Association, the summary of VC lists of Industry Canada (Strategis) and the lists of the equity sources provided by Mike Volker at <http://www.sfu.ca/~mvolker/biz/moneylnk.htm>

identified 197 VC-backed IPOs between 1986 and 2007, and all available data sources and historical records indicates our sample covers 100% of Canadian VC-backed IPOs over this period. We collected the US VC-backed IPOs from SDC Platinum and the prospectus on Edgar. The proportion of Canadian VC-backed firms that list directly in the US is relatively low. The data available on the Thomson VC reporter site indicate that, from the beginning of 1999 to the end of 2008, 20 of the 137 Canadian VC-backed IPOs were listed in the US and two were listed simultaneously in Canada and the US. We keep these two cross-listed IPOs in our Canadian sample; regardless, treatment of these two cross-listed IPOs has no material influence on our results. IPOs of Canadian firms listed in the US are excluded from the sample.¹³

3.2. Matching process

IPOs in the US in general and VC-backed IPOs in particular are different in Canada and the US. For example, the mean gross proceeds is US\$201.57 million in the US (Ritter, 2006) and only US\$114 million in Canada over the years 2001-2003 (Carpentier and Suret, 2008). The comparison of IPOs in Canada and the US requires that we match each Canadian IPO with a comparable IPO in the US. As a consequence of the differences in the distributions of size, it is worth noting that matched US IPOs are smaller than US Canadian VC-backed IPOs in our sample.

We match each Canadian VC-backed IPO with a US VC-backed IPO in the same sector, with the closest size possible and in the same period of time using three steps. First, we match each Canadian VC-backed IPO with a US VC-backed IPO occurring during a 12 month window centered on the Canadian IPO date, from the same two digit industry code, and for gross proceeds adjusted for exchange rates do not differ from more than 50%. We get 39 perfect matches in this first step. Second, we relax the gross proceeds criteria only, and match an additional 32 IPOs. Third, we widen the industry criteria and match based on the description of activity provided in the prospectus. In several cases, Canadian IPOs are so small that we cannot find an US equivalent, and we are unable to match the sample without replacement. In a few cases, two or even three Canadian IPOs are matched with the same US VC-backed IPO. Overall, we get a

¹³ The number of Canadian firms backed by VC that exit in the US through an IPO is too small to constitute a distinct group.

sample of 158 pairs of VC-backed IPOs.¹⁴ In order to assess the robustness of the results to the matching process, we also run the tests on the restricted sample of 126 pairs without multiple matches.

3.3. Summary statistics

Table 1 Panel A reports the main characteristics of the issues for the matched Canadian and US samples. We report in Table 1 the statistics from the matching process without replacement in order to mitigate potential bias in the statistical tests (as discussed, US IPOs are typically not small enough to be matched with Canadian IPOs.) Regardless of the matching process, gross proceeds are higher for the US sample of VC-backed IPOs. This is particularly evident from the medians. This result is perhaps best attributable to the lower listing requirements in Canada relative to the US. We allowed for a difference of 50% between the gross proceeds in the matching process, but this difference was systematically in favour of the US sample. We report the comparison of gross proceeds by sector. The difference is significant in the technology sector and for other sectors.

[Insert Table 1 About Here]

Table 1 Panel B presents the main characteristics of the issuers. Canadian issuers are younger than their US counterparts, but the difference is not statistically significant. There are differences in the two samples for shareholders' equity, total assets, EBITDA and net income. Average EBITDA is negative and average and median net income is negative among US VC-backed IPOs. By contrast, average and median EBITDA and net income are positive in the Canadian sample. This surprising result can be attributed to the fact that we selected the smallest VC-backed IPOs in the US to be able to match with IPOs in Canada. The differences between both samples are statistically significant.

Table 1 Panel B also presents ratios. Because several values used in the denominator of the ratios are negative or zero in our sample, we apply the following rules to calculate the ratios: when the shareholders' equity is negative and the net income positive, we attribute the value of 100% to ROE. When the shareholders' equity and the net income are both negative, we use -100% for ROE. Return on assets (ROA) and return on equity (ROE) are significantly lower in the

¹⁴ We delete 13 IPOs because we do not find a comparable IPO issuer in the US and another 26 IPOs because we are unable to obtain the gross proceeds of the US comparable issuer.

US sample, which is attributable to the poor operating performance of small VC-backed IPOs in the US. Net margin is also significantly lower in the US, while the debt to asset ratio is higher, due to the negative values of equity. In short, the US VC-backed IPOs selected for matching purposes report significantly poorer operating performance than Canadian VC-backed IPOs.

Table 1 Panel C reports the main multiples. Prices to sales, price to earnings or market to book ratios can take extreme values when the denominator is close to zero, and is undefined when the sales are 0 or when the earnings or book value of equity is negative. As these multiples are often used in the literature related to the IPO valuation, we report their mean and median values. However, we apply the following adjustments to the calculations. The multiples are not estimated when sales are zero (price to sales), or when earnings or book value of equity is negative (respectively price to earnings and price to book). In order to mitigate the impact of very low denominators, we winsorize the distribution of the multiples at the 95th percentile.

Table 1 Panel C shows, for each multiple, that US VC-backed IPOs are valued significantly higher than their Canadian counterparts. This result is extremely surprising in view of the poor operating performance of US VC-backed IPOs. For example, median price to sales is 4.27 in the US and 3.11 in Canada. The median price to earnings is 38.64 in the US and 19.64 in Canada. These differences are significant for median values but not for average values because of the high variance in the distributions. Even if we limit these distributions to their 95th percentiles, we get maximum values in the vicinity of 450%. Note that the characteristics of the distribution give rise to the choice of our empirical models, as explained below in Section 5.

Table 1 Panel D shows that US VC-backed IPOs are valued significantly higher in terms of medians for prestigious investment banks, and in terms of both means and medians for non-prestigious investment banks. Note as well that prestigious investment banks are used relatively more frequently (94 of 126) than their matched Canadian counterparts (74 of 126).

Table 2 presents descriptive statistics for the change in ownership at the IPO, post-IPO accounting and market performance, post-IPO liquidity and the survival of the issuer. We present data on the percentage of the pre-IPO firms sold by the CEOs.

Among IPOs without any shareholder sales, the data reported in Table 2 Panel A indicate US VC-backed IPOs have significantly greater proceeds (mean of US\$58.95 million and median of US\$48 million) than their Canadian counterparts (mean of US\$42.49 million and median of

US\$25.18 million). Post-IPO ownership retention of pre-IPO shareholders is significantly higher (mean of 73.29%) in the US than in Canada (65.62%). There are no statistically significant differences in the percentage change sold between Canada and the US for any of the types of shareholders, except for other officers and directors. The decrease in shareholdings of other officer and directors is higher in the US (mean of -4.42%) than in Canada (-0.4%).

[Insert Table 2 About Here]

4. Quality, rationality and liquidity

In this section, we test the hypothesis that the two subsets of firms differ along the following characteristics: the quality, the investors' rationality and the post IPO liquidity. These characteristics cannot be observed ex-ante. We use ex-post data to determine in what extent both groups indeed differ. If they do differ, we add an ex-ante estimator of these characteristics to complement the econometric model.

4.1 Quality

Quality is difficult to define for firms with most of their value in growth opportunities. Helwege and Liang (2004 p.543) include the performance in years following the IPO as a measure of quality. Following this path, and in line with Zheng and Stangeland (2007), in Table 2 Panel B we use a variable that measures growth rates of accounting performance (including earnings and revenues) as measures of firm quality. We complete the analysis of operating performance by the comparison of survival rates in both samples.

Several firms report no sales, negative earnings and tiny book value of equity and asset before the IPO. Pre-IPO values of these variables cannot be used to estimate growth rates. Accordingly, we use the gross proceeds to deflate the change in the performance indicators.

The summary statistics in Table 2 Panel B indicate no significant differences between the growths in accounting numbers of Canadian versus US VC-backed IPOs. On an ex post basis, these two samples can be considered as composed of firms with equivalent quality. Differences in valuations at the IPO cannot be explained by expected differences in performance, if the ex-post performance is used as an estimator of the expected performance at the IPO time.

Table 2 Panel E shows that as at June 2009 US VC-backed IPOs are more likely to still be listed (58.73%) than Canadian IPOs (48.41%). Canadian VC-backed IPOs are more likely to be

acquired or merged with a public firm, privatized or merged with a private firm, or delisted for negative reasons than US VC-backed IPOs. The chi-square test of these differences in proportions is slightly statistically significant.

As we do not observe significant differences on an ex-post basis, we will not include ex-ante estimators of the issuer quality in the model.

4.2 Rationality

Another possibility is that valuations might be higher in the US because investment bankers and their clients are more optimistic in the US than in Canada. If so, we should observe significant differences in the long-run performance following the IPO. In order to test for the differences, in Table 2 Panel C we estimate the following market related variables: underpricing, RR, AR and PPF_0/P_0 . The variables are defined in Table A-1. We estimate each variable at the firm level, and report the statistics for the distribution. We do not use a portfolio approach. Essentially, the raw and abnormal returns do not differ significantly, and the median is perhaps more informative in view of the significant outliers. Due to the very low prices at the IPO, particularly for Canadian IPOs, there are a few very high returns and the average is thus highly right-skewed. The median monthly abnormal return is -0.79 in Canada and -0.84 in the US. BHAR can produce unreliable results when there are very large returns; therefore, we cross-check our results by reporting the ratios between the perfect foresight prices (that is, the price that the investors had expected at a three years horizon if he has a perfect foresight capacity and the issue price). The median of the ratio is 0.76 in Canada and 0.66 in the US, but the difference is not statistically significant. Table 2 Panel C further reports statistics for underpricing, which show some significant differences, but taken alongside the long-run performance it is less plausible that irrational pricing explains valuation differences.

Overall, the data indicate that differences in prices observed at the time of IPO cannot be explained by differences in the long-run market performance following the IPO. Therefore, as with the quality of issuers explanation, irrational pricing therefore appears to be an implausible explanation for differences in IPO valuations between Canada and the US.¹⁵

¹⁵ As a related matter, extant evidence in Derrien and Kecskés (2009) shows investor sentiment matters relatively little compared to fundamentals in equity issuance, at least in terms of the number of new listings and the proceeds.

4.3 Liquidity

Table 2 Panel D reports three measures of liquidity - the trade volume, the trade amount and the rotation – which are estimated three years after the IPO. As trade amounts and trade volume are affected by the differences in prices between Canadian and US stocks, rotation is perhaps the most informative measure. The three variables indicate a large difference between the two sub samples. The median trade amount is 2.52 in Canada and 17.78 in the US, even if the initial sizes of the IPOs were in the same range. The rotation ratio we observe in the US is three time the equivalent ratio in Canada. Accordingly, we cannot rule out the possibility that the differences in prices we observe can be traced to the expected differences in trading activity and liquidity. This implies that this dimension should be included in the econometric model. However, we cannot explain the price difference by a difference in liquidity observed three years after the pricing. We follow the methodology developed by Ellul (2006) in a similar context, to develop an ex ante estimator of liquidity, based on a matched-firm approach. We assume that to forecast an IPO's future liquidity investors use the value observed for a previous IPO of comparable size, belonging to the same sector and from the same country. We estimate the trading volume and the rotation twelve months after this matched IPO and use this estimation as a proxy for the expected liquidity of our IPO sample - expected rotation. These expected rotations are reported in Table 2 Panel D. The median of the expected rotation in both countries are similar to the median of the observed rotation. Accordingly, we can consider that the expected rotation is an acceptable proxy for the real ex-post rotation.

Table 3 reports a correlation matrix for the restricted sample of matched firms. The correlations indicate valuations are significantly higher for IPOs with higher sales, higher R&D expenses, US IPOs, and IPOs that use a prestigious investment bank. We observe a small negative correlation for lower quality VC-backed IPOs for various proxies of quality. For instance, government VC-backed IPOs are negatively correlated with valuation (-0.14), as are Canadian labour sponsored VCs (-0.06). These latter findings are consistent with extant evidence that government and labour sponsored VCs face statutory restrictions that negatively affect their quality (Cumming and Johan, 2009).

This evidence is consistent with the view that sentiment could not be a complete explanation for international differences in IPO valuations in Canada and the US.

[Insert Table 3 About Here]

Overall, the summary statistics and correlations highlight the importance of listing standards and liquidity in explaining international differences in the valuation of VC-backed IPOs, while suggesting less of a role for VC quality, issuer firm quality, and mispricing. We test these explanations further below in a multivariate setting.

5. Econometric models and results

5.1. The models

The analysis of valuation at the IPO is a challenging task, because numerous firms report negative earnings and, in some cases, no sale and even negative values for shareholders' equity. Accordingly, neither q ratios (King and Segal, 2008) nor multiples (Purnanandam and Swaminathan, 2004) can be used and we base our analysis on the model proposed by Aggarwal *et al.* (2009). In this model the dependent variable is the total offer value defined as offer price multiplied by the post-IPO shares outstanding. The method proposed by Aggarwal *et al.* allows for catching the cases of negative earnings, a situation that prevails in VC-backed IPOs. These authors use also a valuation based on first-day closing prices. The difference between first-day closing price (market value) and the offer price can be considered as the amount by which the investment bankers underprice the IPO.

Some variables, as book value of equity, can take on a negative value. Following Aggarwal *et al.* (2009) and Hand (2003), we use the Log transformation as follows, for each continuous variable: $L(W) = \log_e(1+W)$ when $W \geq 0$ in \$ million; and $L(W) = -\log_e(1-W)$ when $W < 0$ in \$ million.

We consider that the value at the IPO is explained by the three main valuation drivers: revenues, book value of equity and earnings. We use the earning before depreciation and interest (EBITDA) following Purnanandam and Swaminathan (2004). The analysis of the distribution of these values indicates they can have a negative or 0 value. We use the L transformation to keep these observations in the sample.

Stock prices are partially determined by growth opportunities, and this is particularly true in the situation of new ventures at the IPO stage. Classical indicators of growth opportunities, like Q

ratios or Book-to-market ratio can hardly be introduced in a model explaining the price. We follow Aggarwal *et al.* (2009) who use R&D expenses as a proxy for growth opportunities.

Prior research has shown that ownership retention by pre-IPOs shareholders has a significant impact on firm value. Consistent with Aggarwal *et al.* (2009), we measure aggregate post-IPO ownership of pre-IPO shareholders, *INSRET*, as (shares outstanding after offering - primary and secondary shares issued) / shares outstanding after offering. As in Aggarwal *et al.* (2009), we study the impact of changes in ownership of different classes of shareholders, including CEOs, the other officers and directors, VCs and other blockholders. Ownership changes are as defined above in subsection 3.4 and presented in Table 2. Large sales of insiders provide a negative signal to the market and thereby lower IPO valuations.

The choice of a prestigious broker or auditor has generally been considered a positive signal, characterized by lower underpricing and better long-run performance, associated with a decrease in the asymmetry of information (Carter and Manaster, 1990). The probability of survival is higher for issuers that hire a prestigious investment banker, according to Schultz (1993) and Demers and Joos (2007). As the choice of prestigious intermediaries positively influences the probability of success, we can expect a positive association between the enrolment of prestigious intermediaries and the valuation. This result is evidenced by Aggarwal *et al.* (2009). Following Carter and Manaster (1990), we consider the most active investment bankers in Canada prestigious. During the period under study, seven investment bankers subscribed to 60% of all the initial and seasoned equity issues, and are thus considered prestigious.¹⁶ We also consider as prestigious US firms with a score higher than 7 in Carter *et al.* (1998). We add to this group international investment bankers such as BNP Paribas, Deutsche Bank and UBS, based on the list of the most active investment bankers worldwide provided by Ljungqvist *et al.* (2003 Table 2, p. 73). In the US, we consider as prestigious each investment banker with a rating higher or equal to 7 in the ranking provided by Loughran and Ritter (2004). The dummy variable *PUND* is 1 when the investment banker is considered prestigious. *PAUDIT* = 1 indicates prestigious auditors (“Big 5” or “Big 4”). We observe that a proportion of 98% of VC-backed IPOs are audited by a prestigious auditor, in each country. Because there is close to no variability is

¹⁶ They are: RBC Capital Markets, CIBC World Market Inc., BMO Nesbitt Burns Inc., TD Securities Inc., Scotia Capital Inc., Merrill Lynch Canada Inc. and Goldman, Sachs & Co. No other Canadian-based investment bankers control more than 5% of the total market.

auditor reputation in our data, the dummy associated with the prestige of auditor is not included in the model.

Litvak (2009) provides evidence that the pair premia, (that is, the value of cross-listed firms in the US relative to their comparable domestic firms) is strongly correlated with US stock indexes and peaks during the bubble in early 2000. We control for the bubble period in one of the model. We considered various other variables but found them to be immaterial for our analysis. Note that we do not include variables for gross proceeds (a proxy for size) and industry as we have matched our samples precisely on size and industry. Finally, we do not control for hot and cold market IPOs as we have matched and controlled for the time of issue.

In sum, the base model takes the following form:

$$L(OV)_i = \alpha_1 + \alpha_2 L(\text{inc})_i + \alpha_3 L(\text{BV})_i + \alpha_4 L(\text{Sales})_i + \alpha_5 L(\text{R\&D})_i + \alpha_6 \text{DCountry}_i + \alpha_7 \text{INSRET}_i + \alpha_8 \text{IBP}_i + e_i \quad (1)$$

The variables are defined in Table A-1. We also report regressions with four alternative forms of the base model which include extra explanatory variables as indicated in Table 4.

5.2. Base model regression results

Table 4 Panels A and B present OLS regression analyses of IPO offer value models in subsection 5.1 for the two different matched samples as described above in subsection 3.2. We explicitly present ten alternative models: five for each of the restricted matched sample (Table 4 Panel A) and the whole sample (Table 4 Panel B), as explicitly specified in subsection 5.1. We discuss a variety of additional specifications below that were considered but did not materially affect the main results.

[Insert Table 4 Panels A and B About Here]

The regressions provide very strong support for the proposition that IPOs are valued higher in the US. These estimates are statistically significant at the 1% level of significance and are economically large. The estimates from the restricted sample indicate valuations are higher by 31-52% (Panel A), and the estimates from the whole sample indicate valuations are higher by 43-66% (Panel B). The country effect matters a great deal regardless of how IPOs are matched by size, industry and year.

Many of the control variables in the models are statistically significant in ways that are quite intuitive and consistent with the prior literature. First, we find a negative relation between income and IPO valuation, and this finding is not due to collinearity with the other control variables. Consistent with Aggarwal *et al.* (2009) and Botman *et al.* (2004), the intuition is that negative earnings are a proxy for stronger growth potential. Consistent with these earlier studies, we note that when we separate out the effect for the Internet bubble period we find the effect of negative earnings is stronger, but for the non-Internet bubble period the effect is statistically significant. But regardless of how we control for different time periods, the central result pertaining to the country effect is not changed in any material way in terms of either economic and/or statistical significance.

Our control variable for size in terms of the book value of equity is significant in most of the models. The sales and R&D variables are positively related to valuation in all of the models, and these effects are statistically significant at the 1% level for sales and at least at the 5% level for R&D in most of the models.

The effect on valuation from the percentage of the post-offering firm owned by the pre-IPO shareholders is positive and significant at the 1% level in all of the models. This finding is consistent with Ljungqvist and Wilhelm (2003), who reason that great insider ownership strengthens incentives to bargain for better offer terms. The variables for insider ownership change are insignificant.

We note there is a strong positive effect of prestigious investment bankers on IPO valuation. This effect is significant at the 1% level in all models. Investment bankers certify the quality of the IPO firm and facilitate greater investor confidence, which results in higher valuations (Carter and Manaster, 1990; Carter *et al.*, 1998)

We considered variables for the quality of auditors and VCs. In terms of auditors, almost all (approximately 98%) VC-backed IPOs used prestigious auditors, and as such there was not material variation and the effect of auditors was insignificant. Regarding VC quality, various proxies considered were statistically insignificant. For example, we considered variables for government funds and labour-sponsored fund (see Table 3 and accompanying text), which are typically of lower quality (Cumming and Johan 2009). There were only 28 IPOs that involved labour sponsored funds. We find in Models 3-5 in both Panels A and B that dummy variables for

government or labour-sponsored funds are insignificant and do not affect the results. Also, in other regressions considered, we likewise found that dummies for labour-sponsored only to be statistically insignificant (although the correlation between government and labour sponsored funds and valuation is -0.14 and -0.06, respectively, in Table 3). Regardless, inclusion / exclusion of these variables did not materially affect the other variables of interest, particularly not the country dummy variable effect. Further, note that other types of variables to account for venture capital reputation (such as those used in Nahata, 2008) did not materially affect the results.

We control for possible clientele effects by including a variable that measures the relative size of institutional investors (model 5). This variable is not statistically significant in all of the regressions we considered. Note that scaling this ratio by market values in the numerator and denominator in each country-year was immaterial to the results. Further, alternative proxies for the importance of institutional investors such as numbers did not affect our results.

To determine the extent that liquidity can explain most or the totality of the observed differences between the valuation of Canadian and US VC-backed IPOs, we use a liquidity variable, namely the expected rotation. The log of this variable ($L(\text{exp. rot})$) is positive and significant in Models 4 and 5 in both Panels A and B. This shows that investors do price liquidity, as expected (Litvak, 2009). Below in subsection 5.3, we consider this issue further by matching IPO samples based on expected liquidity.

5.3. Additional robustness checks

The expected rotation variable is closely related to the country and, for this reason, in this subsection we separately consider matched samples based on expected rotation in the two countries. That is, we test for the liquidity argument by using the expected rotation to define different sub samples. These sub samples include the paired observations only if the expected rotation of the US firm is less than four (three, two, one) times the expected rotation of the Canadian matched firms.

Table 5 presents summary statistics for the matched samples based on rotation. The data show that both average and median IPO valuations are significantly higher in the US than Canada for all of the different matched subsamples based on expected rotation.

[Insert Table 5 About Here]

Table 6 presents regressions with two sets of alternative explanatory variables in Panels A and B, and for each of the matches based on expected rotation. Table 6 shows that even when these rotations are the approximately the same for the US and the Canadian firms (rightmost column), the country variable is still statistically significant (albeit at the 5 and 10% level due to the reduced sample size). Also, the effect is economically large: valuations in the US are at least 57% higher based on the most conservative estimate in Panel A, and 50% higher based on the most conservative estimate in Panel B. These results show that the difference in valuation between Canada and the US is linked to a difference of listing standards regardless of differences in liquidity.

[Insert Table 6 About Here]

Table 7 presents some further robustness checks related to different subsets of the data for prestigious investment banks (or otherwise) and non-governmental funds. At issue is the possibility that choice of investment bank (or possibly choice of venture capitalist) is endogenous to firm quality and hence valuation.¹⁷ We do not believe that an ideal that is correlated with choice of investment bank or venture capitalist exists; as such, we consider subsamples of the data based on the reputation of the investment bank and venture capitalist.¹⁸ In Table 7, the first column considers the subsample of non-prestigious investment banks, and the second column considers the subsample of prestigious investment banks. The third and fourth columns present the same respective subsamples while also excluding government venture capital funds. Panels A and B of Table 7 present two alternative specifications with different explanatory variables.

[Insert Table 7 About Here]

The regressions in Table 7 are very consistent with those reported earlier. The country effect is positive and significant in all models at at least the 5% level. Further, note that the effect is economically large, with the most conservative estimate in Panel A at 53% and the most conservative estimate in Panel B at 33% (in the fourth column in each case). The effect is largest

¹⁷ The choice of the IP has been made several months before the pricing. However, it is likely that the better firms choose the high quality IB, because they get more advantage to signal they are good firms than lower quality firms. Several dimensions related to the quality are, however, included in the model. Moreover, as most firms do not report revenues or positive earnings, quality is not easy to determine upfront.

¹⁸ Also, note that we considered excluding these investment bank and venture capitalist variables from the regressions presented in Table 4 and all of the results including those pertaining to the country effect were not materially different.

in Panels A and B in Table 7 for the third column for non-prestigious investment banks and non-government funds, where the country effect is 95% in Panel A and 68% in Panel B with additional control variables.

Finally, note that we considered a number of additional specifications to assess robustness that are not explicitly reported for reasons of conciseness but nevertheless available on request. For example, we considered the impact of Sarbanes Oxley legislation (SOX) on IPO valuation. According Johnston and Madura (2009), SOX reduces IPO uncertainty and underpricing, and as such we cannot rule out an effect on valuation. Less uncertainty implies a lower cost of capital and higher valuations. We tested the effect of SOX with a post-July2002 dummy variable equal to 1, and we did not find any significant effect. Also, we ran regressions on different subsets of years (e.g., in a prior version with data up to 2004, while the current data are extended to 2007), and did not find any material differences in the results. These and other specifications are available on request.

6. Conclusion

This paper empirically analyzed the valuation of VC-backed IPOs with comparisons across Canada and the US. We posited that the lower listing requirements in Canada would lead to valuations that are much lower in Canada relative to the US, all else being equal. Based on a unique sample of hand-collected data that matched IPOs by size, industry and year across Canada and the US, and controlling for numerous accounting and financial statement variables, ownership levels, ownership changes, and investment banking, VC and auditor quality, we found robust statistically significant evidence that IPOs are valued lower in Canada by approximately 43-66%. Our findings are new insofar as prior studies comparing valuations of publicly traded firms in Canada and the US focus on larger companies with significant analyst coverage. Those prior studies show very small differences in the cost of capital and hence very small differences in valuation of approximately 3%.

We note that the pronounced differences in valuations of small IPO issuers across Canada and the US over the 1986-2007 period are consistent with the view that the Canadian and US IPO markets are segmented due to the regulatory differences (King and Segal, 2008). In our empirical analyses, we matched by size, industry and year and controlled for a variety of variables pertaining to company financial statement performance and ownership. Still, companies continue

to go public in Canada despite the lower valuations. The path Canadian companies follow to obtain US listings is to first go public in Canada and then pursue cross-listing once successfully established in Canada. This strategy minimizes the costs of going public and avoids the more onerous regulations faced by companies going public in the US (Industry Canada, 2001).

By focusing on earlier stage companies where the regulatory environment has a more pronounced effect, the data herein show the economic costs of low listing standards are large. The policy implications are significant. Low levels of valuations for IPOs in Canada can exacerbate the comparatively lower performance of the Canadian VC market relative to the US. The evidence of a low valuation and post-listing performance of VC-backed IPOs could be an explanation of the lack of IPO activity of Canadian VCs. The fact that IPOs are valued lower in Canada than in the US can also explain why VC is less developed in Canada than in the US.

Appendix: Data Sources and Definitions

Accounting and R&D data are directly extracted from the IPO prospectus or prior financial reports when such items were available. If not, we used the financial reports following the IPO and screened for historical data. EBITDA is not always displayed in financial statements. We compute EBITDA precisely where depreciation is reported (including all Canadian IPOs) and estimate EBITDA for some US IPOs where depreciation is not reported for the relevant period. Estimated depreciation is based on the reported CFO depreciation where available (3 observations), and otherwise we compute a quasi-EBITDA by adding back G&A expenses to operating income.

We use the prospectus to identify the investment banks affiliated with each IPO. We determine the lead underwriter, when not explicitly indicated, as the one that sells the largest number of shares. We also determine if the deal was a best effort (BE) or a firm commitment (FC) from the *Underwriting* section in the prospectus. For example, statements such as “The underwriters are committed to take and to pay for all the shares if any of the shares are taken” were used to classify the IPO as a firm commitment.

We use the *principal and selling shareholders* section of the prospectus and the numbers of shares held before and after the offering to compute the changes in ownership. We record the transactions by the CEO, the Officers and Directors net of the CEO operations, and of the VC. We include in VC ownership all holdings of syndicated investors. We correct for holdings of insiders that also appear under VC holdings in the prospectus to avoid double counting. We report the change in ownership of all the other shareholders that own more than 5% before the IPO and who were not accounted for in any other class of shareholder.

Using several sources (including news releases, financial reports and press articles available on Edgar, Sedar, Factiva, FP Infomart and Mergent Online), we documented the fate the IPO firms in our sample from the time of IPO up until June 10, 2009. Some firms are still active and traded, while other are either acquired or merged, renamed, or delisted. We determine if delisting was for substandard performance, or pursuant to a going private transaction.

Finally, financial assets of institutional investors was obtained from the OECD at the following webpage: <http://stats.oecd.org/Index.aspx?DataSetCode=7IA>

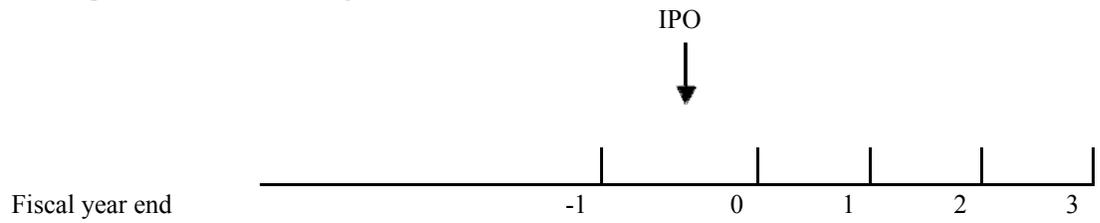
Table A-1 provides definitions for all of the variables.

Table A-1. Variable Definitions

Variable	Definition
OV	Offer Value = Offer price x number of shares outstanding immediately after the IPO (in US \$ million). $L(W)$ stands for the L transformation: $L(W) = \log_e(1+W)$ when $W \geq 0$ in \$millions; $L(W) = -\log_e(1-W)$ when $W < 0$ in \$millions
Underpricing	The initial return estimated between the IPO price and the closing price of the first month of trading. We use the first month closing price because several IPOs are not traded immediately and some of them are initially traded with low volumes.
P_{36}	Market price at the end of the 36 th month following the IPO
RR_{36}	Raw return, including the underpricing, estimated using BHAR methodology during the three years following the IPO. We report raw returns because the index we can use in both countries is not the same.
AR_{36}	Excess return estimated using BHAR methodology during the three years following the IPO. Small caps index relevant in each country has been used. We use the Russel 2000 – Index in the US and the BMO Nesbitt Burns S/C Composite in Canada.
PPF_0	$P_{36} / I_{36} * I_0$ market price adjusted for the variation in the index between the issue time and the end of the 36 th month. I_{36} , I_0 : value of the small caps index at month 36 and 0 respectively. This perfect foresight price had been observed on the prospectus given the investment bankers have had a perfect knowledge of the future. This is a proxy for the intrinsic value of the stock at the IPO time.
PPF_0/P_0	The ratio of the perfect foresight price to the issue price. A ratio lower than 1 indicates that the initial price was set at a too high level.
Inc	Net Income before extraordinary items and R&D during the fiscal year closed just before the IPO (year –1)
BV	Book value of equity at the end of the fiscal year closed just before the IPO
Sales	Sales during the fiscal year closed just before the IPO
R&D	Research and development costs during the fiscal year closed just before the IPO
DCOUNT	1 if the IPO is launched in the US.
INSRET	Percentage of the post-IPO firm owned by pre-offering shareholders: (shares outstanding after offering - primary and secondary shares issued) / shares outstanding after offering.
IBP	Investment bank prestige; IBP = 1 if the investment banker is prestigious.
CEO change	The percentage of the pre-IPO firms sold by the CEOs. Specifically, $CEO\ change = \% \text{ owned by the CEOs after the IPO} * (SOA / SOB) - \% \text{ owned by CEOs before IPO}$, where SOA = number of Shares Outstanding after the IPO, and SOB = number of Shares Outstanding before the IPO
OD change	The percentage of the pre-IPO firms sold by the other directors and officers
VC change	The percentage of the pre-IPO firms sold by the VCs.
DBI	A dummy variable for the Internet bubble period (1999-2000) * Linc
DGov	A dummy variable for government or labour-sponsored VC funds.
$L(\text{exp. rot.})$	The log of the expected rotation (trade amount / market value of a country-size-sector matched IPO 12 months after the matched IPO)
FAII	The ratio of Canadian to US financial assets of institutional investors in the year of the IPO
$\Delta \text{ REV (Post-IPO Revenues Growth)}$	$(REV+3 - REV-1) / GP$, where REV = total revenues
$\Delta \text{ BE (Post-IPO Book Equity Growth)}$	$(BE+3 - BE-1) / GP$, where BE = book value of Equity, $\Delta \text{ BE} = 1$ indicates that the growth in book value of equity is only explained by the proceed of the IPO
$\Delta \text{ NE (post-IPO Net Earnings Growth)}$	$(NE+3 - NE-1) / GP$, where NE = net earnings

Table A-1 (Continued)

Subscripts refer to the following time line:



Fiscal year end

The subscript -1 indicate the fiscal year preceding the IPO. 0 is the subscript of the IPO Year. +3 indicates the third fiscal year following the one including the IPO; When the firm has been deleted of acquired, of if less than 3 years are available since the IPO, we use the last completed fiscal year .

Table 1: Characteristics of the matched sample of Canadian and US Venture-capital backed IPOs, 1986-2007.

Gross proceeds are expressed in million of US dollars (US\$M). Issue price is expressed in US\$. EBITDA stands for earnings before interest, tax, depreciation and amortization. Total assets, Shareholders' equity, sales, EBITDA and net income are expressed in US\$M. ROA is EBITDA divided by total assets. ROE is net income divided by shareholders' equity. The final two columns test whether the difference between the mean (median) summary statistics is statistically significant across sample. Statistical significance at the 10%, 5%, and 1% levels is indicated by *, **, ***, respectively.

	Canadian IPOs			US IPOs			mean difference t test	median difference p value
	#	mean	median	#	mean	median	p value	(sign rank)
Panel A : Characteristics of the issue								
Gross Proceeds (GP)	126	47.57	26.42	126	57.83	46.20	0.2256	<0.0001 ***
Oil & Gas issuers' GP	6	24.13	7.08	4	70.65	75.63	-	-
High-Tech issuers' GP	75	46.00	23.60	87	47.41	43.13	0.9062	0.0003 ***
Other issuers' GP	45	53.29	32.74	35	82.26	70.00	0.0312 **	0.0004 ***
Issue Price	124	6.57	6.11	126	12.19	12.00	<0.0001 ***	<0.0001 ***
% of post-IPO shares sold	123	0.34	0.27	126	0.27	0.25	0.0006 ***	0.0789 *
% of firm's commitment	100	0.81		91	0.95		-	-
Panel B : Characteristics of the issuer prior to the issue								
Age, in year	121	11.23	7.01	126	10.99	7.54	0.9034	0.6115
Total assets	126	86.97	18.26	124	76.48	24.41	0.7207	0.0270 **
Shareholders' equity (SE)	125	19.10	5.10	125	-1.56	0.80	0.0100 ***	0.0017 ***
Negative SE	23	0.24	-	60	0.64	-	-	-
Sales	126	70.78	13.61	126	75.70	26.45	0.8465	0.0411 *
EBITDA	126	9.18	1.00	111	4.28	-1.11	0.3242	0.0212 **
Net Income	126	-1.10	0.19	126	-1.78	-2.34	0.7351	0.0043 ***
Negative net income	59	-	-	77	-	-	-	-
ROA	126	-0.02	0.07	111	-0.30	-0.04	0.0012 ***	0.0013 ***
ROE	126	-0.73	0.03	126	-0.03	-0.60	0.3583	0.0167 **
Net margin	126	-4.19	0.01	126	-5.21	-0.12	0.6654	0.0214 **
Asset turnover	126	1.00	0.83	124	1.02	0.87	0.8476	0.9679
Debt to Asset	126	0.72	0.69	124	1.38	0.96	<0.0001 ***	<0.0001 ***
Panel C : Multiples								
Price to sales	120	37.26	3.11	118	40.37	4.27	0.7796	0.1021 *
Price to earnings	66	62.80	19.64	49	74.16	38.64	0.5461	0.0326 **
Price to book value	100	15.13	7.31	65	20.43	9.35	0.1887	0.0845 *
Panel D : Prestige of investment bank								
Prestigious investment bank	74	69.80	36.23	94	67.24	51.65	0.8425	0.0039 ***
Non prestigious investment bank	52	15.93	11.03	32	30.17	22.50	0.0182 **	0.0006 ***

Table 2: Change in ownership at the IPO and survival of the issuer. Panel A reports the shareholders' sale of shares. Panel B reports the fate of the issuer at the end of the study period (June 10, 2009). Negative reasons include bankruptcy, dissolution, delisting for failure to sustain listing requirements and reverse takeover on the company. Gross proceeds (GP) are expressed in US\$. INSRET is post-IPO ownership retention of pre-IPO shareholders and is measured as: (share outstanding after offering – primary and secondary shares issued) / share outstanding after offering. Underpricing is the initial return estimated between the IPO price and the closing price of the first month of trading. RR (AR) is the raw return (abnormal return), including the underpricing, using a BHAR methodology. PFP₀/P₀ is the ratio of the perfect foresight price to issue price. Exp. rotation means expected rotation (Trade amount / Market value) of a country-size-sector matched IPO 12 months after the matched IPO). The final two columns test whether the difference between the mean (median) summary statistics is statistically significant across then samples. Statistical significance at the 10%, 5%, and 1% levels is indicated by *, **, ***, respectively.

	Canadian IPOs			US IPOs			Mean difference	Median difference
							t test	p value
							p value	(sign rank)
Panel A : Change in ownership, shareholders' sale of shares								
	#	mean	median	#	mean	median		
IPOs without shareholders' sale, GP	81	42.49	25.18	65	58.95	48.00	0.0377 **	<0.0001 ***
IPOs with shareholders' sale, GP	45	56.69	30.54	62	56.67	44.05	0.9988	0.0027 ***
INSRET, in %	122	65.62	72.98	124	73.29	74.87	0.0006 ***	0.0736 *
Change in ownership, in %:								
CEO	13	-4.1	-2.9	18	-1.62	-1.40	0.2452	0.2170
Other officers and directors	14	-0.4	-1.2	27	-4.42	-2.82	0.0880 *	0.1218
VC	21	-5.2	-3.1	15	-3.20	-1.27	0.5783	0.6333
Other principal shareholders	18	-14.9	-4.7	13	-5.38	-3.27	0.1083	0.1337
Panel B: Post IPO growth and accounting performance indicators, for the three years following the IPO								
Δ REV (Post IPO Revenues Growth)	110	2.37	0.60	110	2.79	0.74	0.6170	0.5933
Δ BE (Post IPO Book Equity Growth)	110	3.11	1.25	110	3.67	1.08	0.7196	0.8151
Δ NE (post IPO Net Earnings Growth)	110	-0.55	-0.09	110	-3.13	-0.16	0.3747	0.4560
Panel C: Post IPO and stock performance indicators, for the three years following the IPO								
Underpricing	96	16.16	0.83	96	32.04	11.02	0.2309	0.0253 **
RR (BHAR)	96	-0.94	-0.30	96	-1.57	-0.61	0.4214	0.2807
AR (BHAR)	96	-1.31	-0.79	96	-1.74	-0.84	0.5811	0.4624
PFP ₀ /P ₀	96	1.84	0.76	96	0.94	0.66	0.1055	0.3179
Panel D: Liquidity related variable, for the third anniversary of the IPO								
Trade volume, in million	96	1.56	0.64	96	16.05	2.28	0.0384 **	<0.0001 ***
Trade amount, in \$ million	96	23.10	2.52	96	642.83	17.78	0.1432	<0.0001 ***
Rotation (Trade amount / Market value)	96	0.06	0.04	96	0.28	0.12	0.0003 ***	<0.0001 ***
Exp. Rotation	96	0.05	0.02	96	0.26	0.12	0.0223 **	<0.0001 ***
Panel E: Survival of the issuers								
	#	%		#	%		Chi-square test of proportion	
Still listed	61	48.41		74	58.73			
Acquired of merged with a public firm	31	24.60		27	21.43		Chi-square : 6.97	
Privatized of merge with a private firm	22	17.46		13	10.32		p value : 0.0729*	
Delisted for negative reasons	12	9.52		12	9.52			

Table 3 : Pearson correlation coefficient matrix. This table presents Pearson correlation coefficients for each of the variables in the dataset for the restricted sample (126 matched IPOs for a total of 252 observations). L(OV) is the L transformation of the offer value, which is the offer price multiplied by the number of shares outstanding immediately after the IPO (in US\$M). L(inc) is the L transformation of net Income before extraordinary items and R&D, L(BV) is the L Transformation of Book value of equity, L(sales) is the L transformation of Sales, L(RD) is the L transformation of R&D expenses. All these accounting data are measured at the end of the fiscal year closed just before the IPO. DCountry is equal to 1 if the issue's country is the US. INSRET is percentage of the post-IPO firm owned by pre-offering shareholders. IBP is equal to 1 if the investment banker is considered as prestigious. DLSVCC is equal to 1 if a labour-sponsored VC had been involved with the firm prior to IPO. DGOV is equal to 1 if a government or labour-sponsored VC had been involved with the firm prior to IPO. L(exp. rot.) is the log of expected rotation (Trade amount / Market value of a country-size-sector matched IPO 12 months after the matched IPO). FAII means ratio of Canadian to US financial assets of institutional investors. Correlations greater than 0.11, 0.13, and 0.18 in absolute value are significant at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) L(OV)	1.00														
(2) L(inc)	0.01	1.00													
(3) L(BV)	0.02	0.39	1.00												
(4) L(sales)	0.44	0.54	0.27	1.00											
(5) L(RD)	0.06	-0.26	-0.13	-0.27	1.00										
(6) DCountry	0.36	-0.16	-0.26	0.12	-0.11	1.00									
(7) INSRET	0.19	-0.25	-0.19	-0.27	0.21	0.22	1.00								
(8) CEO change	-0.06	-0.04	-0.01	-0.05	-0.12	0.05	0.05	1.00							
(9) OD change	-0.15	-0.19	-0.09	-0.23	0.04	-0.16	0.07	0.21	1.00						
(10) VC Change	-0.05	-0.13	-0.10	-0.13	-0.01	0.05	0.09	0.08	0.07	1.00					
(11) O5 change	0.02	-0.16	-0.11	-0.12	0.07	0.11	0.30	-0.02	0.02	0.08	1.00				
(12) IBP	0.54	-0.04	-0.05	0.38	0.03	0.17	-0.09	-0.09	-0.09	0.01	-0.06	1.00			
(13) DGOV	-0.14	0.00	0.15	-0.16	0.15	-0.35	0.04	0.06	0.03	-0.03	0.00	-0.14	1.00		
(14) DLSVCC	-0.06	-0.07	0.12	-0.18	0.07	-0.31	-0.02	0.03	0.02	-0.10	-0.01	-0.05	0.67	1.00	
(15) L(exp. rot.)	0.30	-0.03	-0.12	0.10	-0.10	0.45	0.12	-0.06	-0.12	-0.02	-0.01	0.12	-0.30	-0.17	1.00
(16) FAII	0.12	0.04	0.01	0.17	-0.04	-0.03	-0.14	-0.03	-0.15	-0.15	0.07	0.12	0.07	0.05	0.02

Table 4: Ordinary least squares regression analysis of offer value on fundamental values, country dummy and control variables. The dependent variable is the L transformation of the offer value, which is the offer price multiplied by the number of shares outstanding immediately after the IPO (in US\$M). The restricted sample is reduced to the issues matched without replacement (126 matched IPOs) in Panel A, and in Panel B the whole sample includes the issues with multiples matches (158 matched IPOs). L(inc) is the L transformation of net income before extraordinary items and R&D, L(sales) is the L transformation of Sales, L(R&D) is the L transformation of R&D expenses, L(BV) is the L Transformation of Book value of equity. All these accounting data are measured at the end of the fiscal year closed just before the IPO. DCountry is equal to 1 if the issue's country is the US. INSRET is percentage of the post-IPO firm owned by pre-offering shareholders. CEO (OD, VC, O5) change is the percentage of the pre-IPO firms sold by the selling CEOs (Other directors and officers, venture capitalists and other blockholders). IBP is equal to 1 if the investment banker is considered as prestigious. DBI is the interaction between a dummy variable for the internet and Linc. DGov is a dummy variable for government or labour-sponsored VC funds. L(exp. rot.) is the log of expected rotation (Trade amount / Market value of a country-size-sector matched IPO 12 months after the matched IPO). FAII means ratio of Canadian to US financial assets of institutional investors. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A. Restricted Matched Sample Without Replacement										
	Model 1		Model 2		Model 3		Model 4		Model 5	
Intercept	1.8447		1.7995		1.7929		2.2584		1.6150	
	6.8714	***	6.4453	***	6.4575	***	7.1609	***	2.9868	***
L(inc)	-0.0664		-0.0717		-0.0382		-0.0662		-0.0590	
	-1.7991	*	-1.9123	*	-0.9752		-1.6065		-1.4261	
L(BV)	0.0389		0.0374		0.0369		0.0370		0.0395	
	1.7498	*	1.6716	*	1.6586	*	1.5675		1.6744	*
L(sales)	0.2673		0.2624		0.2708		0.2672		0.2607	
	6.4779	***	6.2721	***	6.5053	***	6.2193	***	6.0531	***
L(RD)	0.0684		0.0650		0.0649		0.0497		0.0524	
	2.2327	**	2.0840	**	2.0950	**	1.6073		1.6945	*
DCountry	0.5225		0.5150		0.4820		0.3110		0.3225	
	4.4901	***	4.3174	***	3.8588	***	2.2882	**	2.3758	**
INSRET	1.6307		1.7018		1.6814		1.6639		1.7275	
	4.9751	***	4.9860	***	4.9633	***	4.9347	***	5.0954	***
CEO change			-0.4831		-0.7799		-1.3215		-1.4695	
			-0.1722		-0.2794		-0.4546		-0.5066	
OD change			-1.0433		-0.9202		-1.0698		-0.6956	
			-0.5467		-0.4862		-0.5763		-0.3722	
VC change			-0.9211		-0.7804		-0.6760		-0.4376	
			-0.8285		-0.7084		-0.6331		-0.4063	
O5 change			-0.4034		-0.4095		-0.1906		-0.3479	
			-0.5404		-0.5545		-0.2601		-0.4710	
IBP	0.9297		0.9296		0.8943		0.7932		0.7775	
	7.3924	***	7.3097	***	7.0576	***	6.1443	***	6.0182	***
DBI					-0.1793		-0.1388		-0.1585	
					-2.6361	***	-1.9132	*	-2.1534	**
DGOV					0.0424		0.0243		-0.0061	
					0.2330		0.1319		-0.0328	
L(exp. rot.)							0.0751		0.0725	
							2.0674	**	1.9973	**
FAII									0.1226	
									1.4628	
Number	245		245		245		218		218	
Adjusted R ²	0.5043	***	0.4989	***	0.5095	***	0.4903	***	0.4932	***

Panel B. Whole Sample with Multiple Matches										
	Model 1		Model 2		Model 3		Model 4		Model 5	
Intercept	1.6194		1.4993		1.4740		2.0602		1.5575	
	6.4727	***	5.7388	***	5.6652	***	6.6602	***	2.8966	***
L(inc)	-0.0858		-0.0890		-0.0572		-0.0984		-0.0950	
	-2.4502	**	-2.5100	***	-1.5188		-2.4757	***	-2.3866	**
L(BV)	0.0351		0.0327		0.0316		0.0389		0.0424	
	1.6727	*	1.5513		1.5075		1.6586	*	1.8342	*
L(sales)	0.2886		0.2758		0.2834		0.2870		0.2819	
	7.4463	***	6.9392	***	7.1604	***	6.9830	***	6.8204	***
L(RD)	0.0828		0.0775		0.0755		0.0646		0.0659	
	2.7384	***	2.5297	***	2.4729	***	2.1031	**	2.1433	**
DCountry	0.6413		0.6478		0.6635		0.4251		0.4275	
	5.8477	***	5.8940	***	5.6560	***	3.2030	***	3.2225	***
INSRET	1.5770		1.7429		1.7065		1.6631		1.7219	
	4.9893	***	5.2357	***	5.1532	***	5.0018	***	5.1208	***
CEO change			-0.0754		-0.5710		-0.7646		-0.7471	
			-0.0270		-0.2045		-0.2619		-0.2561	
OD change			-0.8940		-0.7686		-0.5903		-0.5604	
			-0.8015		-0.6831		-0.5343		-0.5075	
VC change			-1.8190		-1.5899		-1.5350		-1.2367	
			-1.4582		-1.2801		-1.2632		-0.9956	
O5 change			-0.8514		-0.8523		-0.5662		-0.6696	
			-1.1576		-1.1678		-0.7783		-0.9139	
IBP	1.0596		1.0808		1.0542		0.9429		0.9321	
	8.5383	***	8.6149	***	8.4433	***	7.3899	***	7.2899	***
DBI					-0.1433		-0.0940		-0.1056	
					-2.3318	**	-1.4230		-1.5804	
DGOV					0.1726		0.1008		0.0875	
					1.0284		0.5958		0.5162	
L(exp. rot)							0.1078		0.1062	
							3.1189	***	3.0723	***
FAII									0.0962	
									1.1425	
Number	294		294		294		256		256	
Adjusted R ²	0.5753	***	0.5755	***	0.5825	***	0.5729	***	0.5734	***

Table 5: Comparison tests for different matched expected rotations. This table reports comparison tests of the log of the transformation of the offer value, which is the offer price multiplied by the number of shares outstanding immediately after the IPO (in US\$M). Test values are presented for Canada (DCountry=0) versus the US (DCountry=1) subsamples. Tests are provided for all the observations in the second column (0). The third (>4), fourth (>3), fifth (>2) and sixth (>1) column include only the paired observations when the expected rotation of the US firm is less than four (three, two, one) times the expected rotation of the Canadian matched firms. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Deleted Rotations		0	>4	>3	>2	>1
Dcountry=0	mean	4.33	4.46	4.52	4.53	4.49
Dcountry=1	mean	5.18	5.27	5.28	5.31	5.31
	t test	<0.0001	<0.0001	0.0004	0.0005	0.0046
		***	***	***	***	***
Dcountry=0	median	4.39	4.50	4.65	4.66	4.52
Dcountry=1	median	5.27	5.31	5.32	5.33	5.37
	p value	<0.0001	<0.0001	0.0003	0.0004	0.0045
		***	***	***	***	***

Table 6: Ordinary least squares regression analysis of offer value on fundamental values, country dummy and control variables including expected rotation. The dependent variable is the L transformation of the offer value, which is the offer price multiplied by the number of shares outstanding immediately after the IPO (in US\$M). The restricted sample is reduced to the issues matched without replacement (126 matched IPOs). L(inc) is the L transformation of net Income before extraordinary items and R&D, L(sales) is the L transformation of Sales, L(RD) is the L transformation of R&D expenses, L(BV) is the L Transformation of Book value of equity. All these accounting data are measured at the end of the fiscal year closed just before the IPO. DCountry is equal to 1 if the issue's country is the US. . DBI is the interaction between a dummy variable for the internet and L(inc). The second column (0) includes all the observations. The third (>4), fourth (>3), fifth (>2) and sixth (>1) column include only the paired observations when the expected rotation of the US firm is less than four (three, two, one) times the rotation of the Canadian matched firms. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A. First Specification of Explanatory Variables for Different Matched Expected Rotations										
Deleted rotations	0		>4		>3		>2		>1	
Intercept	3.1158		3.3261		3.3744		3.3616		3.1765	
	20.2213	***	14.7953	***	13.9197	***	13.1081	***	10.2129	***
Linc	-0.136		-0.0998		-0.1087		-0.1121		-0.0938	
	-3.3329	***	-1.6821	*	-1.7004	*	-1.6759	*	-1.1234	
LBV	0.0256		0.0052		0.0056		0.0062		0.007	
	1.0157		0.1421		0.1448		0.1504		0.1384	
Lsales	0.3729		0.3631		0.3728		0.3742		0.4254	
	9.022	***	5.8748	***	5.5782	***	5.3696	***	4.8565	***
LRD	0.1237		0.1256		0.1164		0.1175		0.1719	
	3.6078	***	2.1767	**	1.9247	*	1.8782	*	1.8769	*
DCountry	0.714		0.6047		0.5681		0.5986		0.5714	
	5.5747	***	3.2213	***	2.8182	***	2.8143	***	1.9884	**
Number	248		142		130		123		91	
Adjusted R2	0.3642	***	0.287	***	0.2692	***	0.2645	***	0.2869	***
Panel B. Alternative Specification of Right-Hand-side Variables										
Deleted rotations	0		>4		>3		>2		>1	
Intercept	3.0961		3.2768		3.3383		3.3272		3.147	
	20.4387	***	14.7819	***	14.000	***	13.175	***	10.3726	***
Linc	-0.0895		-0.0473		-0.0514		-0.0509		-0.0075	
	-2.0924	**	-0.7621		-0.7642		-0.7162		-0.0844	
LBV	0.0268		0.0035		0.0034		0.003		0.0142	
	1.0816		0.0954		0.0892		0.0754		0.2882	
Lsales	0.3754		0.377		0.3834		0.3842		0.4262	
	9.2448	***	6.1842	***	5.8305	***	5.597	***	4.9931	***
LRD	0.1226		0.1239		0.1116		0.112		0.1475	
	3.6386	***	2.1857	**	1.8778	*	1.8198	*	1.641	*
DCountry	0.6566		0.5187		0.4816		0.5035		0.4996	
	5.1645	***	2.7647	***	2.3938	**	2.3609	**	1.773	*
DBI	-0.2386		-0.2662		-0.2697		-0.2671		-0.3304	
	-3.1329	***	-2.4552	**	-2.3817	**	-2.2561	**	-2.3418	**
Number	248		142		130		123		91	
Adjusted R2	0.3866	***	0.3124	***	0.2958	***	0.2893	***	0.3227	***

Table 7: Ordinary least squares regression analysis of offer value on fundamental values, country dummy by subset based on investment bankers and venture capitalists. The dependent variable is the L transformation of the offer value, which is the offer price multiplied by the number of shares outstanding immediately after the IPO (in US\$M). The restricted sample is reduced to the issues matched without replacement (126 matched IPOs). L(inc) is the L transformation of net Income before extraordinary items and R&D, L(sales) is the L transformation of Sales, L(RD) is the L transformation of R&D expenses, L(BV) is the L Transformation of Book value of equity. All these accounting data are measured at the end of the fiscal year closed just before the IPO. DCountry is equal to 1 if the issue's country is the US. DBI is the interaction between a dummy variable for the internet and L(inc). L(exp. rot.) is the log of expected rotation. DGov is equal to 1 if VC is a government or labour-sponsored VC funds. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A. First Specification of Explanatory Variables								
Subset	IBP=0		IBP=1		IBP=0 and DGOV=0		IBP=1 and DGOV=0	
Intercept	2.1957		4.4191		2.0411		4.4552	
	11.4032	***	21.3618	***	9.5538	***	19.7363	***
Linc	-0.2707		-0.0171		-0.2673		-0.0114	
	-3.5071	***	-0.4016		-3.0386	***	-0.2673	
LBV	0.1369		0.0024		0.0845		0.0010	
	2.5910	**	0.0970		1.4334		0.0417	
Lsales	0.4736		0.1281		0.5206		0.1223	
	6.1958	***	2.6005	***	6.2345	***	2.3576	**
LRD	0.1764		0.0323		0.1889		0.0492	
	3.9326	***	0.7996		2.9689	***	1.1641	
DCountry	0.8654		0.5625		0.9522		0.5279	
	4.7392	***	3.9899	***	4.8267	***	3.6187	***
Number	81		167		67		154	
Adjusted R2	0.5401	***	0.1257	***	0.5693	***	0.0983	***
Panel B. Alternative Specification of Right-Hand-side Variables								
Subset	IBP=0		IBP=1		IBP=0 and DGOV=0		IBP=1 and DGOV=0	
Intercept	2.6765		4.6889		2.8529		4.7028	
	9.0281	***	17.1702	***	8.1320	***	15.8207	***
Linc	-0.2316		-0.0322		-0.2170		-0.0299	
	-2.7330	***	-0.6807		-2.0541	**	-0.6315	
LBV	0.1045		0.0030		0.0501		0.0028	
	2.0261	**	0.1115		0.8613		0.1026	
Lsales	0.4685		0.1443		0.4937		0.1334	
	5.7631	***	2.8108	***	5.1955	***	2.4599	***
LRD	0.1472		0.0303		0.1461		0.0467	
	3.4215	***	0.7391		2.3604	**	1.0850	
DCountry	0.6621		0.3426		0.6848		0.3302	
	3.2906	***	2.0983	**	3.1903	***	1.9657	**
DBI	-0.5315		-0.0889		-0.3645		-0.0773	
	-2.3017	**	-1.1001		-1.2223		-0.9305	
L(exp. rot)	0.0865		0.0826		0.1656		0.0727	
	1.6131		1.7586	*	2.4119	**	1.4608	
Number	73		147		59		135	
Adjusted R2	0.5650	***	0.1266	***	0.5891	***	0.0937	***

References

- Abdallah, A. A.-N. and C. Ioannidis (2009). "Why Do Firms Cross-List? International Evidence from the US Market." *The Quarterly Review of Economics and Finance* Forthcoming.
- Aggarwal, R. K., S. Bhagat and S. P. Rangan (2009). "The Impact of Fundamentals on IPO Valuation." *Financial Management* 38(2): 253-284.
- Baker, M. and P. A. Gompers (2003). "The Determinants of Board Structure at the Initial Public Offering." *Journal of Law and Economics* 46(2): 569-598.
- Beatty, R. and P. Kadiyala (2003). "Impact of the Penny Stock Reform Act of 1990 on the Initial Public Offering Market." *Journal of Law and Economics* 46(2): 517-541.
- Beaulieu, M., M. Gagnon and L. Khalaf (2009). "A Cross-section Analysis of Financial Market Integration in North America using a Four Factor Model." *International Journal of Managerial Finance* 5(3): 248-267.
- Black, B. S. and R. J. Gilson (1998). "Venture Capital and the Structure of Capital Markets: Banks Versus Stock Markets." *Journal of Financial Economics* 47: 243-277.
- Botman, M., P. Roosenboom and T. van der Goot (2004). Valuing Internet Stock at the IPO. *Advances in Financial Economics: JAI*. Volume 10: 131-155.
- Bushee, B. J. and C. Leuz (2005). "Economic Consequences of SEC Disclosure Regulation: Evidence From the OTC Bulletin Board." *Journal of Accounting and Economics* 39(2): 233-264.
- Carpentier, C., J.-F. L'Her and J.-M. Suret (2009). "Stock Exchange Markets for New Ventures." *Journal of Business Venturing* Forthcoming.
- Carpentier, C. and J.-M. Suret (2006). "Bypassing the Financial Growth Cycle: Evidence from Capital Pool Companies." *Journal of Business Venturing* 21(1): 45-73.
- Carpentier, C. and J.-M. Suret (2008). "The Survival and Success of Canadian Penny Stock IPOs." *Small Business Economics* Forthcoming
- Carter, R. and S. Manaster (1990). "Initial Public Offerings and Underwriter Reputation." *The Journal of Finance* 45(4): 1045-1067.
- Carter, R. B., F. H. Dark and A. K. Singh (1998). "Underwriter Reputation, Initial Returns, and the Long-run Performance of IPO Stocks." *The Journal of Finance* 53(1): 285-311.
- Chemmanur, T. J. and E. Loutskina (2006). The Role of Venture Capital Backing in Initial Public Offerings: Certification, Screening, or Market Power? Available at SSRN <http://ssrn.com/paper=604882>
- Chiang, Y., Y. Qian and A. Sherman (2009). "Endogenous Entry and Partial Adjustment in IPO Auctions: Are Institutional Investors Better Informed?" *Review of Financial Studies* Forthcoming.
- Claus, J. and J. Thomas (2001). "Equity Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Markets." *The Journal of Finance* 56(5): 1629-1666.
- Cohn, S. R. (1999). "Impact of Securities Laws on Developing Companies: Would the Wright Brothers Have Gotten off the Ground?" *Journal of Small and Emerging Business Law* 3: 315-366.
- Cox, J. D. (2000). "Premises for Reforming the Regulation of Securities Offerings : an Essay." *Law and Contemporary Problems* 63(3): 11-44.
- Cumming, D. and S. Johan (2009). *Venture Capital and Private Equity Contracting: An International Perspective*. Burlington, Academic Press.

- Demers, E. A. and P. Joos (2007). "IPO Failure Risk." *Journal of Accounting Research* 45(2): 333-371.
- Derrien, F. and A. Kecskés (2009). "How Much Does Investor Sentiment Really Matter for Equity Issuance Activity?" *European Financial Management* 15(4): 787-813.
- Doidge, G., A. Karolyi and R. Stulz (2004). "Why Are Foreign Firms that List in the U.S. Worth More?" *Journal of Financial Economics* 71(2): 205-238.
- Dorn, D. (2009). "Does Sentiment Drive the Retail Demand for IPOs?" *Journal of Financial & Quantitative Analysis* 44(1): 85-108.
- Durufflé, G. (2006). The Driver of Canadian VC Performance. Canadian Venture Capital Association Annual Conference, June 6, 2006
http://www.cvca.ca/files/Duruffl_Presentation_June_2006.pdf
- Easley, D. and M. O'Hara (2009). "Liquidity and Valuation in an Uncertain World." *Johnson School Research Paper Series* 13-08.
- Ellul, A. and M. Pagano (2006). "IPO Underpricing and After-Market Liquidity." *Review of Financial Studies* 19(2): 381-421.
- Elyasiani, E., S. Hauser and B. Lauterbach (2000). "Market Response to Liquidity Improvements: Evidence from Exchange Listings." *The Financial Review* 35(1): 1-14.
- Foster, N. (2003). The FASB and the Capital Markets. The FASB Report (June 2003)
http://www.fasb.org/articles&reports/Foster_FASBReport.pdf
- 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.
- Hand, J. R. M. (2003). Profits, Losses and the Non-Linear Pricing of Internet Stocks. *Intangible Assets: Values, Measures and Risks*. J.R.M.Hand and B. Lev Eds. New York, NY: : Oxford University Press.
- Harris, A. D. (2006). "The Impact of Hot Issue Markets and Noise Traders on Stock Exchange Listing Standards." *University of Toronto Law Journal* 56(Summer): 223-280.
- 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.
- Healy, P. M. and K. G. Palepu (2001). "Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature." *Journal of Accounting and Economics* 31(1-3): 405-440.
- Helwege, J. and N. Liang (2004). "Initial Public Offerings in Hot and Cold Markets." *Journal of Financial and Quantitative Analysis* 39(3): 541-569.
- Industry Canada (2001). Issues Surrounding Venture Capital, Initial Public Offering (IPO) and Post-IPO Equity Financing for Canadian Small and Medium-Sized Businesses (SMEs). Report prepared for the Small Business Policy Branch by E. Wayne Clendenning & Associates
- Johnston, J. and J. Madura (2009). "The Pricing of IPOs Post Sarbanes-Oxley." *The Financial Review* 44(2): 291-310.
- King, M. and D. Segal (2008). "Market Segmentation and Equity Valuation: Comparing Canada and the United States." *Journal of International Financial Markets, Institutions and Money* 18(3): 245-258
- King, M. R. and D. Segal (2008). "The Long-Term Effects of Cross-Listing, Investor Recognition, and Ownership Structure on Valuation." *Review of Financial Studies* Forthcoming.

- La Porta, R., F. Lopez-De-Silanes, A. Shleifer and R. Vishny (2002). "Investor Protection and Corporate Valuation." *The Journal of Finance* 57(3): 1147.
- Lambert, R., C. Leuz and R. E. Verrecchia (2007). "Accounting Information, Disclosure, and the Cost of Capital." *Journal of Accounting Research* 45(2): 385-420.
- Levitt, A. (1998). "The Importance of High Quality Accounting Standards." *Accounting Horizons* 12(1): 79-82.
- Litvak, K. (2009). The Relationship Among U.S. Securities Laws, Cross-Listing Premia, and Trading Volumes. Available at SSRN: <http://ssrn.com/abstract=1443590>
- Liu, W. (2006). "A Liquidity-augmented Capital Asset Pricing Model." *Journal of Financial Economics* 82(3): 631-671.
- Ljungqvist, A. (2007). IPO Underpricing: A Survey. *Handbook in Corporate Finance : Empirical Corporate Finance, Volume 1*. B. Espen Eckbo ed: North-Holland: 375-422.
- Ljungqvist, A. and W. J. Wilhelm (2003). "IPO Pricing in the Dot-com Bubble." *The Journal of Finance* 58(2): 723-752.
- Ljungqvist, A. P., T. Jenkinson and W. J. Wilhelm Jr (2003). "Global Integration in Primary Equity Markets: The Role of U.S. Banks and U.S. Investors." *Review of Financial Studies* 16(1): 63-99.
- Loughran, T. and J. Ritter (2004). "Why Has IPO Underpricing Changed Over Time?" *Financial Management* 33(3): 5-37.
- Loughran, T. and J. R. Ritter (2002). "Why Don't Issuers Get Upset About Leaving Money on the Table in IPOs?" *Review of Financial Studies* 15(2): 413-444.
- Macey, J. R. and M. O'Hara (2002). "The Economics of Stock Exchange Listing Fees and Listing Requirements." *Journal of Financial Intermediation* 11(3): 297-319.
- Manigart, S., K. Baeyens and W. V. Hyfte (2002). "The Survival of Venture Capital Backed Companies." *Venture Capital : An International Journal of Entrepreneurial Finance* 2(2): 103-124.
- Maynes, E. and A. Pandes (2009). Private Placements of Equity and Liquidity. EFA 2008 Athens Meetings Paper, Available at SSRN <http://ssrn.com/paper=1106668>
- Morck, R. and F. Yang (2001). The Mysterious Growing Value of S&P 500 Membership. NBER working Paper 8654, Available at SSRN: <http://ssrn.com/abstract=302013>
- Nahata, R. (2008). "Venture Capital Reputation and Investment Performance." *Journal of Financial Economics* 90(2): 127-151.
- Purnanandam, A. K. and B. Swaminathan (2004). "Are IPOs Really Underpriced?" *Review of Financial Studies* 17(3): 811-848.
- Ritter, J. R. (2006). Some Factoids About the 2005 IPO Market. Working Paper <http://bear.cba.ufl.edu/ritter>
- Sarkissian, S. and M. J. Schill (2008). Cross Listing Waves and the Search for Value Gains Available at SSRN: <http://ssrn.com/abstract=1244042>
- Sarra, J. (2009). Proportionate Securities Regulation: The Potential for Scaled Treatment of Junior Issuers. Study commissioned by the Expert Panel on Securities Regulation, Available at: <http://www.expertpanel.ca/documents/research-studies/Proportionate%20Securities%20Regulation%20-%20Sarrra.English.pdf>
- Schultz, P. (1993). "Unit Initial Public Offerings: A Form of Staged Financing." *Journal of Financial Economics* 34(2): 199-230.
- Suchard, J.-A. (2009). "The Impact of Venture Capital Backing on the Corporate Governance of Australian Initial Public Offerings " *Journal of Banking and Finance* 33(4): 765-774.

Witmer, J. and L. Zorn (2007). Estimating and Comparing the Implied Cost of Equity for Canadian and U.S. Firms. Working Paper 2007-08, Bank of Canada September <http://www.bank-banque-canada.ca/en/res/wp/2007/wp07-48.pdf>

Zheng, S. X. and D. A. Stangeland (2007). "IPO Underpricing, Firm Quality, and Analyst Forecasts." *Financial Management* 36(2): 1-20.