The Survival and Success of Penny Stock IPOs: an Analysis of the Consequences of Low Listing Requirements

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Abstract

We analyze a large sample of IPOs realized in a country where the minimal listing requirements are amongst the lowest in the world. In Canada, IPOs mainly consist of micro- and penny stocks offered by non-venture-backed companies in the developing stage. The proportion of issuers without revenues (positive earnings) is 45% (71%) and the median issue price is CAN$0.75, less than Euro0.50. Consequently, Canada offers a very rich context to study the effect of relatively lenient requirements on the survival and success of these issues. We divide issuers into four categories, from the lowest level of requirement (no sales, earnings or history) to the highest level (major exchange listing requirements).

Using this classification, we analyze the survival and success of Canadian IPOs based on an original sample of 2,373 issues from 1986 to 2003. Following the TSX Venture Exchange, we consider that a newly listed company succeeds if it graduates to a senior exchange. Using Survival functions and Cox Proportional Hazards models, we test whether the differences between the survival and success rates are linked to the class of minimum listing requirements in which the company is situated at the IPO. Lastly, we estimate the costs and benefits in terms of failure and success associated with easing the new listing requirements. Our research attempts to contribute to the debate surrounding IPO regulation, listing requirements, and the balance between investor protection and issuer financing. The situation we analyze, where a stock market plays a role usually assumed by specialized intermediaries such as venture capitalists, is also of interest for public policy makers.

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INTRODUCTION

The initial listing requirements define the conditions that a company must meet in order to be initially listed on an exchange. Together with the disclosure requirements, the minimal listing requirements are amongst the main criteria that the regulators and the exchanges establish. High requirements limit the capacity of growing business to be publicly funded but enhance the market quality. Lower requirements enable more companies to be listed and increase the exchange's revenues but reduce investors' protection. In the last twenty years, changes in initial listing requirements observed in several countries illustrate the quest to attain an equilibrium between these effects.

In the U.S., investor protection was the main reason put forth to justify the Penny Stock Reform Act (PSRA). Introduced in 1990, the PSRA was intended to curb fraudulent security issues by placing severe restrictions on IPOs that were priced below $5 (Beatty and Kadiyala 2003). The desire to ease the financing of emerging companies led to the creation of several "new" (or junior) markets, which apply more lenient listing rules than the regular exchanges, in Europe (Bottazzi and Da Rin 2002), Japan (Mizuno 2006), the U.K. and several Asia-Pacific countries. Such an approach has been questioned following the collapse of the first and second wave of these markets in Europe (Goergen, Khurshed, McCahery and Renneboog 2003, Rasch 1994), and after the fall of the Amex emerging companies marketplace (Aggarwal and Angel 1999) and the predecessor of the Alternative Investment Market (AIM)--the Unlisted Securities Market (Buckland and Davis 1989). More recently, the AIM seems to have successfully replaced traditional quantitative listing requirements with a principle-based system and sponsorship.

The increasing competition between exchanges to attract new listings and trading fees also explains some of the changes in listing requirements. Several exchanges significantly lowered their listing requirements during the technology bubble to attract new listings and increase their revenues from listing and transactions fees (Harris 2006). For example, in 1997 NASDAQ modified its listing requirements to ease access to public financing for smaller and less mature firms. However, the new standard allowed the entry of a large cohort of early stage, financially weak, speculative firms that ultimately rose and fell with the NASDAQ bubble of the late 1990s

(Klein and Mohanram 2006). The technology IPO debacle was generally attributed to the deterioration of the quality of businesses that decided to go public (Peristiani and Hong 2004). Fama and French (2004) and Clark (2002) observe that new issues are increasingly floated by immature and unprofitable firms. Canadian and several European exchanges also eased their requirements during that period (Harris 2006). An opposite movement was initiated in the U.S. When it revised the Penny Stock Rule in 2005, the SEC froze the minimal listing requirements and required a positive net income, a market value of listed securities of $50 million and a minimum bid price of $4 per share.[1] In the same vein, the U.K. Listing Authority was transferred from the London Stock Exchange to the Financial Services Authority on May 1, 2000.[2]

There is little empirical evidence to guide the exchanges in the setting of listing requirements. The desirability and efficacy of regulation through listing standards is still an open and important question (Beatty and Kadiyala 2003, Macey and O'Hara 2002). According to Bottazzi and Da Rin (2005) "*there is an obvious need to evaluate how existing rules perform, in terms of selecting valuable companies*". Harris (2006, p. 224) highlights the relative lack of academic research into this critical function of stock exchanges. Klein and Mohanram (2006) underline that there is little extant evidence on the economic ramifications of stock market initial listing standards. The objective of our paper is to provide empirical evidence of the effects of different listing requirements on the outcome of the IPO process.

The difficulty of establishing a usable research design probably explains the scarcity of empirical studies. One approach consists in analyzing the effects of changes in the listing requirements on the quality and fate of newly listed companies. However, the frequency of the changes impedes the analysis of their effects on the long-run. The second option is to analyze specific periods during which firms can list on one exchange using two different sets of standards, e.g. at the end of the '90s for the NASDAQ (Klein and Mohanram, 2006). However, such situations are uncommon. We adopt a third approach. We use a large sample of 2,373 IPO collected from 1986 to 2003 in a country where the initial listing requirements are so low that we can consider that every company could be listed. We then attempt to answer the following question: what are the consequences of applying more stringent initial listing requirements on the survival and success of newly listed companies? We define success as graduation to a higher level market, a criterion

[1] http://www.sec.gov/rules/final/34-51983.pdf
[2] Financial Services Authority, *Annual Report 2001/02* (London: FSA, 2002), p.63

commonly used by the exchange itself. We examine both the probability and the time to failure and success, taking the classical control variables into consideration. [3]

Canada presents a unique opportunity to analyze the effect of listing requirements: for the last twenty years, the median issue price, pre-issue shareholders' equity and gross proceeds were respectively CAN$0.75, CAN$310,000 and CAN$800,000, more than 45% of issuers report no revenues and 71% report negative earnings. The majority of Canadian IPOs can be considered penny stock IPOs while, in most countries, minimal listing requirements exclude micro-capitalization and start-up from the market. We define the status of each issue relative to hypothetical listing requirements, based on the conventional threshold generally used by the exchanges. The more stringent threshold mimics the listing requirements now imposed by the NASDAQ. Companies should be profitable and have a minimal size. General opinion about IPO minimal size is expressed by Berger and Udell (1998 p.13) as follows: "*a combination of informational opacity and issue costs will determine the size of firm for which a public offering becomes economically attractive. (...) A reasonable guess for the minimum assets size for entering this market would be about $10 million.*" The "new" markets generally required IPO gross proceeds of Euro5 million, which, added to the required Euro1.5 million in pre-IPO equity, resulted in a total shareholders' equity of about US$10 million. Our second threshold stipulates that companies should be profitable at the listing date. According to the lower threshold, newly listed companies should report revenues before the IPO. In our sample, a significant proportion of issuers do not meet this minimal requirement.

Our general hypothesis is that imposing more stringent requirements should limit the new listings to a sub-sample of firms of better quality, with lower failure rates and higher success probability. Previous literature on junior markets and penny stock IPOs suggests that the Canadian strategy is probably not viable. Penny stock IPOs are known for their low returns and high delisting rates (Bradley, Cooney, Dolvin and Jordan 2006). Among traditional IPOs, size, maturity and profitability at issue date also appear to be positively linked to the survival rates of new issues (Bhabra and Pettway 2003, Demers and Joos 2007, Fama and French 2004) and with long-run performance (Demers and Joos 2007). Low listing standards should imply more significant failure rates of new issues (Klein and Mohanram 2006). The few analyses of the success rates of

[3] We assume that if more restrictive requirements were implemented, the companies did not change their listing strategy.

new issues (Jain, Jayaraman and Kini 2007) indicate that an increase in firm age, number of employees, pre-IPO investor demand and governance considerations are associated with a higher probability of success, estimated by post-IPO profitability. It is likely that the success rates of immature new issues, in which institutional investors cannot generally participate, would be low.

This study makes several contributions to the literature on initial listing requirements and IPOs. First, it adds to the scarce literature devoted to the economic effects of minimal listing requirements, by linking these requirements with the success and failure of newly listed companies. Given the strong interest in junior markets in Europe, and in line with the AIM experimentation of principle-based listing requirements, this question is intriguing for both rule-makers and academics. Second, we document the performance of a system that is a substitute for the conventional venture-capital (VC)-based financing path. In Europe, "new" stock markets were implemented to target small and medium-sized companies, but they were not designed to list nascent companies. Moreover, the public equity funding gap has increased in Europe (Mendoza 2007, p. 25-27). Experts in the field observe "*a fundamental market failure in the provision of early-stage financing in both the US and the EU. Venture capital funds are concentrating on larger and larger deals, leaving the small and risky early-stage deals aside*" (European Commission 2005, p.10). The analysis of a strategy that bypasses the VC market is thus important for policy makers. Third, we also contribute to the very limited literature on penny stock IPOs. Approximately 2,000 Canadian IPOs can be considered penny stocks, whereas the only other recent paper on this topic draws upon 251 U.S. observations (Bradley, Cooney, Dolvin and Jordan 2006). Fourth, we provide empirical evidence of the probability and determinants of reaching the important milestone, i.e. graduation to a more senior market. In this sense, we build on the findings of Jain, Jayaraman and Kini (2007), who study the success of Internet IPOs from 1996 to 2000. Our work could ground a debate on fine-tuning listing requirements, to improve the effectiveness of a permissive approach to listing. To initiate this discussion, we perform a cost-benefit analysis of easing listing requirements.

The next part discusses the specific features of the Canadian market in terms of listing requirements, institutional involvement, financing possibilities and success of listed firms. Part 2 surveys the previous results and presents our hypotheses, and part 3 discusses data sources, measurement problems and stylized facts. We discuss the methodology and our results in part 4. The last section concludes the paper.

1) DISTINCTIVE CHARACTERISTICS OF THE CANADIAN MARKET

There are two main recognized stock exchanges in Canada: the Toronto Stock Exchange (TSX), and the TSX Venture Exchange (TSXV). The TSXV and its predecessors are junior markets. The Canadian market comprises a few large-sized companies, generally cross-listed in the U.S., and a large number of small and micro caps. In Canada, most of the smallest public companies trade on the TSXV, but many companies listed on the TSX can also be considered small caps. This results in part from very lax listing requirements on both exchanges.

The minimum requirements for a listing on Tier 2 of the TSXV are as follows: stock price over CAN$0.15 and post-IPO net tangible assets and market capitalization higher than CAN$500,000. 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. The TSXV has no requirements relative to issuer profitability; it simply stipulates sufficient working capital for 12 months of operations. The "new" markets in Europe devoted to growing companies generally require minimum gross proceeds of Euro5 million, equal to approximately CAN$8 million. The AIM does not apply specific quantitative listing criteria, although the principle-based approach to listing requirements engenders IPOs of companies that are, on average, more mature than in the rule-based Canadian system.

The small size of the new issues, their speculative dimension and the low liquidity of their shares in the after-market prevents institutional investors from playing a significant role in all but the largest Canadian IPOs. Cumming and McIntosh (2001), using CVCA data, found 30 primary issues connected with VC firms in Canada in 1992-1995, or 7.65% of the 392 issues made in that period. Corresponding values in the U.S. are approximately 40%. Few institutional and specialized investors are involved in the shareholding of new listings, in contrast with the AIM. According to Mendoza (2007, p. 39), "*AIM's investors base is mostly composed of institutional investors, entities specializing in AIM investments and wealthy individuals with plentiful experience in securities trading*". Detailed statistics on shareholding are not available for TSX and TSXV new venues, but the median post-IPO capitalization is below CAN$2 million. Such a value is too small to permit institutional investments, generally limited to the 60 most heavily capitalized Canadian stocks. Accordingly, the IPO Canadian market is largely driven by individual investors.

Jain, Jayaraman and Kini (2007) assert that the survival of newly listed firms depends on their capacity to attract new finance. In Canada, a significant proportion of subsequent offerings (SEOs) and private placements (PPs) by public companies are raised by small and unprofitable firms. According to Carpentier, L'Her, Smith and Suret (2007), the proportion of SEO (PP) issuers without revenues is 22.98% (39.36%). Corresponding proportions for firms reporting negative earnings are 48.43% (65.64%). The frequency of these transactions is high: the number of PPs or SEOs in Canada from 1993 to 2003 is about two thirds of that reported in the U.S., although the Canadian market is approximately one tenth of the size of the U.S. market. In Canada, small public firms with no earnings and even without revenues can easily finance their growth.

For firms listed on the TSXV, graduation to the TSX equals success: As an incubator for emerging growth companies, the TSXV encourages its "best customers to move to the senior market to access greater pools of liquidity."[4] A considerable body of research on exchange listings has identified three main reasons that motivate many firms to list their stocks on a new trading venue: the potential for a reduction of marketability costs; improvement in visibility and investor base; and the signaling of favorable future performance (Papaioannou, Travlos and Viswanathan 2004). Graduation to a higher level exchange is generally preceded by a strong rally. During the period under analysis, more than 827 TSXV companies listed on the TSX or, in a few cases, on a foreign market.

Cross-listing toward a U.S. exchange can be seen as an equivalent success for TSX-listed companies. Companies list abroad to enjoy better visibility, improve their stock liquidity and reduce their cost of capital. The decision to list abroad may be motivated by a certification effect. The cross-listing announcement is generally associated with positive abnormal returns; managers have a positive perception of cross-listing. Cross-listing is very common among Canadian companies, which can list in the U.S. using the same documents they provide to the Canadian regulators. From 1986 to 2006, more than 510 Canadian companies cross-listed in the U.S.

Furthermore, the Canadian stock market is characterized by the large relative weight of natural resources companies. The Energy (Oil & Gas) sector accounts for 13% of companies listed on the TSXV and 25.22% of market capitalization. Corresponding values for the Materials (Mining)

[4] See *Take your Business to the Next Level*, TSX Venture Exchange, 2005.

sector are 46.74% and 50.70%. Collectively, natural resources (Energy and Materials) companies account for 27.36% of companies listed on the TSX and for 38.07% of its capitalization, (Nicholls 2006).

2) PREVIOUS STUDIES AND HYPOTHESES

2.1) REVIEW OF THE LITERATURE

Our research endorses the point of view of the exchanges and regulators. For this reason, we are more concerned by the long-run performance of newly listed companies than by a short-term phenomenon such as underpricing. The long-run studies are devoted to documenting and explaining abnormal returns along with the survival of new issues. This last point is the most pertinent from a perspective of the listing requirement. A company unlikely to survive should not be allowed to list, because it negatively affects market quality and often induces a total loss for the investors. While most of the studies in this area are devoted to failures, it is equally important to examine the success of newly listed companies. Setting optimal listing requirement consists in allowing every firm with a reasonable chance of success to list and to impede access for companies with a high risk of failure.

Except for Klein and Mohanram (2006)'s work, the analyses of new listing survival or success fail to consider the dimension of initial listing requirements. However, several variables included in these studies are generally integrated in the investigation of minimal listing requirements. Table 1 summarizes the few analyses of the survival of new issues. Generally, the authors classify the issuers as surviving, failed and acquired firms. In some cases, however, acquired firms are classified as non-surviving. The failure rates reported by the studies of new issuers in the U.S. are highly volatile, and range from 6.4% (Bradley, Cooney, Dolvin and Jordan 2006) for non-penny stocks to 40% (Fama and French, 2004) for smaller issuers, relative to the median size of the NYSE. Lower failure rates of 2.9% after 5 years are reported in the Asia Pacific markets, where IPOs concern largely capitalized and profitable companies (Ferris, Jayaraman and Sabherwal 2007). The length of the observation period explains a large part of the observed variation: failure rates of 10% to 11% are reported in studies limited to the three years following the IPO. Non-survival rates generally reach 20% after five years and the highest rates appear when the analysis covers 10 years (Fama and French 2004, Hensler, Rutherford and Springer 1997). Fama and French report failure rates of 40.5% and 12.2% respectively for issuers

under/over the median size of the NYSE. Accordingly, the other important variable explaining survival rates is the size of the issue or issuer. A limited sub-sample of survival analysis addresses the particular situation of penny stock IPOs (Bradley, Cooney, Dolvin and Jordan 2006, Seguin and Smoller 1997) or micro-market capitalization companies (Dalbor and Sullivan 2005). These studies report that the failure rate of penny stock IPOs is 3 to 5 times higher than that of non-penny stock IPOs. In Canada, Boubakri, Kooli and L'Her (2005) use a sample of 431 IPOs by firms that subsequently list on the TSX; the survival rate is 76.8% after 3 years. To our knowledge, only one analysis of the success rates of new issuers has been published (Jain, Jayaraman and Kini 2007).

Insert Table 1 about here

Even if the growth of new ventures has attracted the attention of several researchers (Gilbert, McDougall and Audretsch 2006), very few works explore the definitions and conditions of success of newly listed companies. VC-backed firms have faster sales and asset growth (Coakley, Hadass and Wood 2007). According to Field and Lowry (2005), IPOs with greater institutional shareholding outperform those with lesser institutional shareholding, and, over the long-run, institutions' advantage lies entirely in their ability to avoid firms that exhibit the worst performance. Individual investors thus invest disproportionately in poorly performing firms. Field and Lowry estimate that a simple strategy of investing in firms with positive earnings prior to the IPO would enable individuals to avoid much of this underperformance. Chemmanur and Paeglis (2005) show that IPOs of firms with higher management quality are characterized by lower underpricing, greater institutional interest, more reputable underwriters, greater long-term stock returns and stronger post-IPO operating performance. Jain, Jayaraman and Kini (2007) find that an increase in firm age, number of employees, pre-IPO investor demand and governance considerations are associated with a higher probability of success, estimated by post-IPO profitability. Klein and Mohanram (2006) focus on the economic effect of disparate financial initial listing standards for firms newly listed on NASDAQ. They show that firms that exceed the profitability standards are less likely to delist and have higher long-run returns. Further, the literature indicates that positive earnings, institutional interest, VC involvement and management quality are associated with superior performance of newly listed firms. However, a rigorous analysis of the success of new issues has yet to be done.

Previous studies are hampered by a significant selection bias (Bradley, Cooney, Dolvin and Jordan 2006). Most IPO studies explicitly delete penny stock offerings from the sample (Jain and Kini 1999, Ritter 2003). Indeed, IPOs priced under $5 became rare after January 1, 1990, when the SEC began to regulate offers priced below $5 more strictly with the introduction of Rule 15c2-6 of the Securities Enforcement and Penny Stock Reform Act of 1990. Moreover, in several studies the final sample is only a limited subsample of the population, e.g. in Clark (2002), where 1,234 out of 4,000 issues are analyzed. Jain and Kini acknowledge (p. 1285) that "*the nature of the restrictions (...) favours inclusion of relatively larger and less risky firms".* Consequently, "*very small public issues have been mostly ignored in the academic literature",* as Brau and Osteryoung (2001 p. 210) conclude. Seguin and Smoller (1997) also observe (p. 335) that by explicitly eliminating penny stock issues from their samples, other researchers may have overlooked an interesting facet of IPO behavior. In this study, we attempt to obtain the required information for the whole population of new issuers during the period under analysis.

2.2) HYPOTHESES

Listing standards generally refer to profitability, size and market capitalization, stock prices and shareholder numbers as main indicators.[5] Previous empirical and theoretical works suggest that lowering the threshold for these quantities reduces the quality and survival of issuers. However, governance consideration and specialized intermediaries can mitigate this effect, together with several control variables.

2.2.1) Minimum listing requirements and survival

Minimum listing requirements generally stipulated positive earnings, before the introduction of market-based listing requirements dictated by capitalization (Klein and Mohanram 2006). The requirement of reporting revenues before listing is implicit in the earnings requirements, and stock exchanges generally do not consider listing firms at a pre-revenue stage. There are arguments against the listing of such growing companies. First, the failure rate of companies at a pre-revenue stage is high, and individual investors do not have the tools and abilities to correctly appraise such investments, which share many characteristics of private equity. Second, pre-revenue firms are generally financed by specialized intermediaries that are able to address information problems through screening, contracting and monitoring activities. As Giudici and

[5] The changes in the NASDAQ listing standards are illustrated by Fama and French (2004, Table 2)

Rosenbaum (2004) maintain, "*stock market financing lacked the typical provisions such as active monitoring and covenants that are implemented by venture capitalists to protect their investments against information asymmetries and entrepreneurs' opportunism.*" Accordingly, our first proposition is that firms entering the market at a pre-revenue development stage will have a higher failure rate and a lower success rate.

Firms with revenues but no earnings present the same risks and valuation problems as firms without revenues, to a lesser extent. They must rely on external financing. Moreover, unprofitable firms find it more difficult to hire and retain high quality human resources, whose involvement seems to be critical in explaining newly listed companies' success (Jain, Jayaraman and Kini 2007). Consistent with Klein and Mohanram (2006), and Peristiani and Hong (2004) we anticipate a larger failure rate and a lower success rate for this group of issuers than for profitable firms.

Amongst profitable issuers, we predict that smaller companies have lower success rates and higher delisting probabilities than larger ones. Berger and Udell's (1998) threshold of US$10 million at the beginning of the '90s can easily be translated into US$18 million (CAN$25 million), which is the level 2 requirement of NASDAQ. Consequently, our third proposition is that profitable firms below this threshold will have a higher failure rate and a lower success rate than the largest ones.

We define the status of each issue relative to hypothetical listing requirements.[6] The first variable (NORM1) is given a value of 1 if the issuing company does not satisfy the minimal requirement of having revenues. NORM2 is 1 if the issuer has revenues but no positive earnings. Most of the new listing rules include a requirement for a track record of earnings. We consider that a firm is situated at level 3 (NORM3 = 1) if the issuer has positive earnings but shareholders' equity lower than CAN$25 million. Issuers that exceed this threshold are classified as level 4 (NORM4 = 1); they generally have sufficient characteristics at the issue time to list on NASDAQ.

2.2.2) Governance and specialized intermediaries

VC-backed IPOs generally exhibit better post-listing performance (Doukas and Gonenc 2005) and survival probability (Chou, Cheng and Chien 2006, Jain and Kini 2000, p.1139). By filtering

[6] We do not refer to profitability ratios commonly used in U.S. studies; more than 70% of the new Canadian issuers exhibit a loss at IPO

the ventures they finance, VCs are able to select the best prospects. They remain involved in the newly listed firms for several months, owing to the rules prohibiting the sale of their shares. They can then pursue their function of monitoring and consulting and thus have a positive effect on performance. VBIPO is equal to one if a VC was involved in the company before the IPO[7]. We anticipate a positive (negative) relationship between the involvement of VC and the success (failure) of IPOs.

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 Demers and Joos (2007).[8] However, competent brokers and industry-specialist auditors can also play a major role in helping start-ups, particularly small and emerging firms, to acquire resources for successful development. These expert intermediaries seem to influence the survival of newly listed firms significantly (Chou, Cheng and Chien 2006). We hypothesize that prestigious auditors and investment bankers are associated with lower (higher) delisting (success) rates. 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.[9] We also consider as prestigious U.S. firms with a score higher than 7 in Carter, Dark and Singh (1998). We include in 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, Jenkinson and Wilhelm (2003 Table 2, p. 73). The dummy variable PUND is one when the investment banker is considered prestigious. PAUDIT = 1 indicates prestigious auditors ("Big 5" or "Big 4").

2.2.3) Control variable

The 20-year period we analyze is characterized by several sector-specific events: the bubble and crash in the technologies sector, the robust increase in resources prices in the beginning of the

[7] Because the length and the size of our sample preclude the measurement of ownership levels in a significant proportion of the sample, we do not consider these variables in our study.
[8] See Ritter (2003) for a review of the role and effects of investment bankers in the IPO process.
[9] 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 banker owns more than 5% of the total market.

2000s, and the solid performance of the Energy sector beginning approximately in 2001. These events are likely to influence new listings, mortality and success rates of companies in each of these sectors. Based on SIC codes, we defined three dummy variables respectively associated with High Tech, Energy and Materials (DHT, DEN and DMAT). Young and less mature firms generally exhibit higher failure rates after entering the stock market (Clark 2002, Demers and Joos 2007). We expect a similar relationship. In this study, AGE is the number of years since the incorporation of the issuer. We define AGE1=1 when AGE<=5 years and AGE2=1 when AGE>5 years.

The negative relationship between size at IPO and the failure risk is affirmed by Hensler, Rutherford and Springer (1997), Jain and Kini (2000), and Chou, Cheng and Chien (2006). Accordingly, we expect a negative relationship between the size of the IPO and the delisting rate. LOGSIZE is the natural logarithm of the post-issue shareholders' equity.[10] Several IPOs occur during Hot issue market periods, characterized by an excess demand for new issues that attract lower quality issuers (Loughran and Ritter 2004). Accordingly, we expect a lower survival rate for issues occurring during Hot issue market periods. We characterize Hot and Cold Issue market periods following Helwege and Liang (2004), by estimating the three-month centered moving average of the IPO number. DHOT (DCOLD) has a value of 1 if the corresponding month is in the upper (lower) third of the moving average distribution.

3) DATA AND STYLIZED FACTS

3.1) DATA SOURCES

We collected the lists of IPOs from FPInfomart.ca since 1993 and from the annual lists of the Financial Post for the previous years. We analyzed each observation to detect Capital Pool Company Program IPOs, privatization of state-owned companies and demutualizations. Our initial sample includes all conventional[11] IPOs from 1986 to 2003. We exclude only IPOs

[10] Post-issue shareholders' equity is the sum of the shareholders' equity before the issue and the gross proceeds of the issue. Fama and French (2004) argue that when examining fundamentals, firm size should be defined in terms of assets. Defining size in terms of market equity tends to allocate firms that are large in terms of assets but have low profitability to the small group. As a result, small market equity firms tend to more closely resemble weak firms than when size is defined in terms of assets. To address Fama and French's argument, we replicated our tests using the natural logarithm of the total assets before the issue. Our conclusions are unchanged.

[11] The Capital Pool Program has been implemented in Canada with the objective of easing the creation of shells, subsequently used in reverse merger listings by operating companies. The IPO of a capital pool

resulting from the creation of income trusts, because they are essentially the continuation, in another form, of a previously existing public company, along with the few cases of privatization of state-owned companies and demutualizations, for similar reasons. Prospectuses are available in SEDAR only since 1997.[12] We obtain those of previous years from the Autorité des Marchés financiers du Québec, investment bankers and academic libraries in several provinces. We supplemented the accounting information with old versions of Thomson Financial Cancorp. Stock market data, required to assess the delisting, merger or acquisition circumstances, come from DataStream. In Canada, there is no equivalent to the CRSP delisting codes. Therefore, we hand check the status of the 2,373 issues at June 30, 2007 (and five and ten years after the issue). We first use the TSX and TSXV website to verify whether the issuer is still listed. For each of the delisted stocks, we then identify the approximate date of delisting using the stock market database. In the next step we identify the reason for and the exact circumstances of the delisting using information from the InfoTSXV database, Sedar, FPInfomart.ca, the securities and exchange commissions' cease trade orders lists, Factiva and research tools on the Internet. We obtained a list of VC-backed-IPOs from Thomson Financial VC Reporter, for the years 1986 to 1990, 1997, and 1999 to 2003. For the other years, we analyze the list of important shareholders in each of the prospectuses. We identify each of the 145 cases where a VC was involved in the company before the IPO.[13] The TSXV provided a list of graduated companies from 1995 to mid-2007, and we supplement these data for the previous period using the monthly Reviews of the exchanges. We collected the new cross-listings in the U.S. from the monthly review of the TSX, for each month from 1987 to 2007.

3.2) ISSUER STATUS DETERMINATION

3.2.1) Delisting

Generally, stock exchanges define rules and delist companies whose stocks do not meet requirements based on price, capitalization or volume. NASDAQ delists a company if the stock

company results in the listing of a non-operating company. Its sole asset is cash and its life is limited by law to 18 months. Accordingly, we consider Capital Pool IPOs as non-conventional and exclude them from our sample.

[12] SEDAR, the Canadian equivalent of the U.S. EDGAR, was implemented in 1997.

[13] We compile a list of VCs operating in Canada from 1986 to 2003 from the lists of the Canadian Venture Capital 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. While some prospectuses are missing, we probably slightly underestimate the number of VC-backed-IPOs from 1991 to 1996.

trades under $1 for 30 days, and if the situation is not corrected during the following 6 months (Macey, O'Hara and Pompilio 2005).[14] In the U.S. the CRSP database provides a delisting code that informs researchers of the reason for and the date of delisting of a security. In Canada, the delisting rules allow securities to stay listed for a very long period, even if these securities are not traded or if their price is very low.[15] Several of these stocks are used as shell companies during a reverse takeover listing. Before the NEX[16] was created, in 2003, companies that fell below TSXV's ongoing listing standards were designated inactive and given 18 months to meet the standards or be delisted. However, the delisting is not systematic; *the Exchange uses discretion and flexibility in applying the rules* (CDNX 2001). The ongoing listing standards to Tier 2 of the junior market refer to a minimal market capitalization of CAN$100,000 (in 2007), minimal working capital of CAN$50,000[17] and significant operating revenues in the previous 12 months; or at least $100,000 on expenditures directly related to the development of assets in the previous 12 months. No conditions apply to the stock price. By comparison, similar limits for the NASDAQ (under standard 1) are US$5 million for market capitalization and US$1 for the stock price.[18]

To align our delisting definition with previous studies, we apply a rule which mimics the NASDAQ delisting practice as well as the decision criteria used by authors like Demers and Joos (2007). We consider as "dead" any stock which maintains a price lower than CAN$0.1 for seven

[14] Delisting rules are complex, they vary between exchanges and their application is partially discretionary (Macey, O'Hara and Pompilio 2005). In 2001, Nasdaq suspended this *Penny Stock Rule* for several months because "*about 15 percent of Nasdaq's listed companies are trading below $1 at this time*" See Aliza Earnshaw: Nasdaq suspends $1 minimum listing requirement, Portland Business Journal at http://www.bizjournals.com/portland/stories/2001/09/24/daily41.html, last visited January 30, 2008.

[15] In December 2001, 313 stocks listed on the TSXV had prices equal to 3 cents or less.

[16] According to the TSXV, "*NEX is a new and separate board of TSX Venture Exchange. It provides a new trading forum for listed companies that have fallen below TSX Venture's ongoing listing standards NEX companies have the opportunity to refinance, reactivate or reinvent themselves in order to re-apply to TSX Venture Exchange provided they can evidence their compliance with TSX Venture Minimum Listing Requirements"*. See the TSX Web site, last visited January the 30, 2008, at http://www.tsx.com/en/nex/aboutUs/about.html

[17] However, The Exchange uses discretion and flexibility in applying Tier 2 TMR. According to the TSX Manual (2007, policy 2.5, p.3) "*If an Issuer has a viable business although it does not meet certain elements of the Tier 2 TMR, the Exchange may determine that it is not appropriate to transfer the Issuer to NEX. The Exchange will consider the seasonal or other cycles which affect an Issuer's business. If an Issuer's Working Capital is low because of seasonal or other temporary conditions, the Exchange may delay enforcement of this Policy but will continue to monitor the Issuer"*.

[18] According to the Listing Standard and Fees document, available on the NADAQ site (last visited January 30, 2008), at http://www.nasdaq.com/about/nasdaq_listing_req_fees.pdf

consecutive months. We use the 10-cent limit given that Canadian IPO prices are on average, one tenth of prices in the U.S.[19] This rule applies in 233 of the 2,373 issues. However, in 49 of these cases, the application of the rule has the sole effect of producing a delisting rule that is earlier than the date reported by the exchanges. We also consider as non-surviving a stock which is used as a shell for a reverse takeover, all companies whose stocks were delisted by the exchange, or subject to an issuer cease trade order at the time of the analysis, failed companies that are not yet delisted, and those whose stocks are only traded OTC or NEX.

3.2.2) Mergers and acquisitions

Several acquisitions appear to be profitable for the investors, whereas others are clear failures, mainly after the burst of the technology bubble. We analyzed each of the 170 mergers and 467 acquisitions, using data from Financial Post, SEDAR and Internet sources.[20] In the case of mergers, we assume that the resulting company is a continuation of the issuer. The issuer status is then one of a merged company. In the case of acquisitions, we collected the acquisition prices per share (including the value of share exchanges) and qualified as failures the 22 cases where the acquisition price is lower than CAN$0.10.

3.2.3) Success

We consider that a TSXV IPO firm succeeds when it "graduates" to the main exchange, the TSX, or a foreign exchange. A sub-sample of IPO firms lists directly on the TSX; we consider these IPOs as a success when they achieve listing on a U.S. exchange.[21] To ensure that graduation or cross-listing can indeed be considered success, we estimate the abnormal return for the sample of graduated and cross-listed Canadian companies, during the three years preceding and following the listing on the new exchange. We use the Fama-French factor model (1993).[22] During the three

[19] Demers and Joos (2007) report a mean and median issue price in the vicinity of US$15 to US$16. The corresponding value is US$2 (CAN$3).

[20] In 15 cases, we found no traces of the issuer in databases, specialized sites, SEDAR or stock exchanges' publications. We consider these companies to be delisted, and assign an arbitrary delisting date to them two years after the issue.

[21] Since 1995, 44 Canadian companies listed on the Alternative Investment Market (AIM) in London. This junior market is not considered superior to the TSX in terms of requirements or visibility, and we do not consider a listing on AIM as a success for TSX companies.

[22] We estimate the following regression for our samples of graduate or Canadian interlisted firms:
$R_{p,t} - R_{f,t} = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t}$
The dependent variable of the regression is the monthly excess return of the portfolios (Rp,t - Rf,t), which corresponds for a given month t to the returns of the portfolio of Canadian interlisted firms (Rp,t) less the

years preceding the graduation, the monthly abnormal return for TSXV firms that graduate to the TSX is a large 2.41% and is highly significant. For the three years before the graduation, the total abnormal return is 89.32%. The corresponding values for TSX companies that cross-list are 0.89% and 33.27% respectively. Post-listing abnormal returns are negative but non-significant for graduate firms and near 0 for newly cross-listed firms. These numbers indicate that graduation and cross-listing can indeed be considered an indicator of success for newly listed companies. **Table 2** summarizes the variables, and the expected relationship between these variables and survival or success.

Insert table 2 about here

3.3) STYLIZED FACTS

Table 3 presents the main characteristics of the 2,373 Canadian IPOs from 1986 to 2003. The total gross proceeds are CAN$28.8 billion. For the whole period, the median gross proceeds are CAN$0.80 million. This low level is partly due to the 1986-1990 sub-period. The median gross proceeds are higher than CAN$2 million from 1991 to 2000, and decrease to $1.68 million after that. The 90th percentile of the gross proceeds distribution (CAN$25.9 million) is roughly equivalent to US$18 million. The median issue price ranges from CAN$0.50 to CAN$1.25 depending on the sub-period and is CAN$0.75 overall. The annual median price is higher than CAN$2 only in 1993, a Hot issue market period during which several technological firms listed on the TSX. Overall, the 75th percentile of the price distribution is equivalent to US$2, and less than 5% of the issues are priced higher than US$10. Even when compared with penny stocks or micro-capitalization issues in the U.S., Canadian IPOs appear to be very small, both in terms of issue prices and gross proceeds. Bradley, Cooney, Dolvin and Jordan (2006) report mean gross proceeds of US$5.7 million for penny stock IPOs, with an average offer price of US$4.42.

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risk-free rate (the monthly rate of 91-day Canadian Government Treasury bills, Rf,t). The independent variables are the excess market return and two zero-investment portfolios that we construct to mimic the risk factors common to all securities. All data are taken from DataStream and Cancorp. We have constructed SMB and HML in keeping with Fama and French (1993). Stocks are ranked in July based on their size and book-to-market ratios. The stocks are subsequently sorted into two size groups and three book-to-market groups based on our universe breakpoints: the stocks above the 50 percent size breakpoint are designated B (for big) and the remaining 50 percent are designated S (for small); the stocks above the 70 percent book-to-market breakpoint are designated H (for high), the middle 40 percent are designated M and the firms below the 30 percent book-to-market breakpoint are designated L (for low). Six value-weighted portfolios, S/L, S/M, S/H, B/L, B/M and B/H, are formed at the intersection of size and book-to-market groups.

Dalbor and Sullivan (2005) study micro-capitalization companies' IPOs, subsequently traded OTC. The average issue price and gross proceeds are US$10.03 and US$25.96 million respectively.

Similar to the U.S., we observe Hot and Cold issue periods: the number of IPOs peaks in 1987-1988, with 365 and 356 IPOs respectively, and reaches a low in 2001 and 2002 with 32 IPOs. For each year, we report the proportions of issues in the main sectors. Natural resources companies represent 44.33% of new issues in Canada, reflecting the relative prominence of this activity in that country. High Tech firms account for 20.71% of new issuers, but the proportions of these two groups of issuers fluctuate strongly during the period analyzed. We also report the proportion of issuers without sales and with negative earnings. For the whole period, the proportion of issuers with no sales is 45.32%. From 1986 to 1990, this proportion reaches 57.86%. The new listing of firms at a development stage is therefore not a recent phenomenon in Canada. Overall, the proportion of issuers reporting losses at IPO is slightly over 71%, but reaches 77.65% and 78.79% during the first and the last sub-periods respectively. In Canada, the proportion of issuers with earnings per share (EPS) lower than 0 is approximately double the corresponding proportion estimated by Ritter and Welch (2002) in the U.S.

Insert table 3 about here

In **Table 4**, we present the distribution of the status of the issuers by cohort. Panel A presents the situation at June 30, 2007. Overall, non-surviving issuers represent 48.52% of the sample, despite the limited failure rate for the most recent years, compared with 63% to 73% for the issues floated between 1987 and 1990. The global success rate (graduation or cross-listing) is 13.81% for the whole period. A proportion of 37.67% of issuers remain listed, but they do not graduate to a higher level exchange. Therefore, in the long-run, approximately 5 out of 10 new issuers in Canada fail, 1 succeeds and 4 stay alive but do not progress. In Panel B, we present a similar distribution when the issuer status is estimated 5 years after the IPO, to allow comparisons with previous studies. The proportion of non-surviving firms falls to 11.60%. Surprisingly, this failure rate is lower than the one reported for a similar horizon in U.S. studies (see Table 1). Panel C reports the results after 10 years. The delisting rate is 28.29%. This is clearly less than the failure rate reported by Fama and French (2004) for the issuers with size under the median of the NYSE (40.5%). Three U.S. studies deal specifically with penny stocks, comparable to, albeit larger than Canadian IPOs. Weber and Willenborg (2003) report a delisting rate of 25.3% after 4 years,

Bradley, Cooney, Dolvin and Jordan (2006) a rate of 31.5% after 3 years, and Dalbor and Sullivan (2005) estimate the failure rate at 44%. Despite listing requirements that are significantly more permissive than in the U.S. and even the fact that a large proportion of new issuers report no sales, the survival rate of new issuers in Canada after 5 or 10 years seems to be higher than that observed in the U.S. This situation can probably be explained by the capacity of developing listed firms to issue private or public equity, even with negative earnings or no revenues, which would allow emerging firms to finance their growth, for up to 11 years. The comparison of Panels A and C illustrates the high rate of delisting that follows the tenth anniversary of the IPO. For example, for the 1991 cohort the delisting rate is 21.88% in December 2001, but reaches 46.88% in 2007. Approximately 20% of this cohort disappears between years 11 and 15.

Insert table 4 approximately here

Panel A of **Table 5** presents the median of the main characteristics of the sample, depending on the issuer status at the end of the period of analysis.[23] The median issue price is CAN$0.85 overall, but it is only CAN$0.55 for non-surviving firms. This result is in line with the relationship between post-listing performance and issue prices observed in the U.S. (Fernando, Krishnamurthy and Spindt 2004). Median age at IPO varies according to the fate of the issuers. Non-survivors are two years old at the IPO, and surviving firms are four years old, illustrating the role of maturity in the survival of new issues. The non-survival firms are smaller: their median shareholders' equity is CAN$0.17 million. Panel B of Table 5 presents the survival rates, in 2007, according to the main independent variables. Financial situation, and more generally the issuer situation relative to theoretical listing requirements, strongly influences survival rates. 61.37% of NORM1 issuers (no revenues) delist, whereas 38.63% survive. The corresponding values are 12.50% and 87.50% for NORM4, with revenues, positive earnings and shareholders' equity over CAN$25 million. The probability of success is, however, approximately the same for the three groups that exhibit revenues at IPO; this rate ranges from 15.93% to 16.96%. It is only 10.77% for issuers without revenues. A newly listed Canadian company at a pre-revenue stage thus succeeds in one case in 10, and fails in approximately 6 cases out of 10.

[23] These medians may differ slightly from those reported in Table 4 because we are restricted by the availability of accounting data. We were able to collect this information for 2,028 of the 2,373 firms in the population (85.3%).

We observe strong variations between the success and failure rates depending on the sector: 63.22% of Energy issuers survive. Several such issuers are acquired or merged, consistent with the intense consolidation in this sector, but only a few companies can be considered fire sales. The rate of graduation in this sector is 18.39%, a result in line with the progression of oil prices toward the end of this period. The success rate of High Tech issuers is 21.90%. As expected, prestigious intermediaries involved in the IPO process decrease the failure rate and increase the success rate. The effect is striking for VC: the failure rate for VC-backed issuers is less than 50% of that of non-VC-backed issuers (22.07% vs. 50.56%), and the success rate is more than two times higher when VC are involved (28.97% vs. 12.64%). The issue period is linked to the probability of failure. This probability is higher when the issue happened during a Hot issue period (54.45%), which is consistent with lower investor rationality during Hot issue periods. Finally, issuers' maturity seems to play a role: nearly 57% of the youngest issuers (less than 5 years old) are delisted versus 32.50% of the oldest issuers.

Insert table 5 about here

4) EMPIRICAL MODELS

4.1) METHODOLOGIES

Survival analysis has recently been applied in business to predict new issuer delisting (Chou, Cheng and Chien 2006) or conversely, attainment of profitability (Jain, Jayaraman and Kini 2007). This type of analysis is capable of processing censored data that represent situations where the response of interest (failure or success in our case) has not yet occurred. Therefore, the duration until the event is known for only a portion of the sample. In the presence of this censored distribution, conventional econometric OLS procedures are ill-suited to duration analysis because they produce biased and inconsistent estimates.

We proceed in two stages. First, we use the *Kaplan-Meier estimator* to estimate the survival function and assess the individual effects of the main variables. The Kaplan-Meier estimator is defined as:

$$\hat{S}(t) = \prod_{t_i < t} \frac{n_i - d_i}{n_i} \qquad (1)$$

where n_i is the number of firms that are still at risk at time t_i and d_i is the number of firms that actually failed at time t_i. The Kaplan-Meier estimator provides a reading on the likelihood of survival at time t based on the survival history of all firms. For each dependant variable, we segment the sample into two or more groups and calculate the Kaplan-Meier estimator for each group. We then use the Mantel-Haenszel log rank test to compare the differences between the groups. For each sub-group, we also estimate the median survival time.

In the second step, we use the proportional hazards (PH) regression developed by Cox (1972) to model time-to-failure and time-to-success for IPO firms. The main advantage of a Cox PH model is that we are not required to make any assumptions about the underlying distribution of the data. This model assumes the following functional form for the hazard function: T is the length of the listing period on the original exchange. The probability that an IPO issued at t=0 stays on this exchange (before delisting or migration) longer than time t is a cumulative density function, measured from t to infinity.

$$S(t) = P(T > t) = \int_t^{\infty} f(u)du = 1 - F(t) \tag{2}$$

$S(t)$ is the survival function and f(t) and $F(t)$ are, respectively, the density and distribution functions of T. This expression represents the likelihood that a firm will continue to be in existence at time t, given the baseline rate of survival among observed firms and other characteristics that vary over time, if it has been in operation continuously in prior periods.

The hazard rate $h(t)$ measures the conditional probability that the IPO is delisted (graduated) instantaneously given that it has survived up to time t. It is expressed by:

$$h(t) = \lim_{\Delta t \to 0} \frac{P(t \le T \le t + \Delta t \mid T \ge t)}{\Delta t} = \frac{f(t)}{S(t)} \tag{3}$$

The Cox model is defined by:

$$h(t) = h_0(t) \cdot exp(X\beta) = h_0(t).exp(\sum_{k=1}^{p} \beta_k X_k) \tag{4}$$

$h_0(t)$ is the unknown *baseline hazard function,* X a (1×p) vector of independent variables and β is a vector of parameters to be estimated. The model is called proportional risk because for two observations, i and j, the risk rate ratio is a constant and the risk rates are proportional. The inference of β is based on a partial likelihood approach. Using this *partial likelihood function*, the parameters can be estimated without specifying the baseline hazard function $h_0(t)$. The advantage

of this method relative to the concurrent Accelerated Failure Rate method explains our methodological choice.

4.2) RESULTS

4.2.1) Survival functions

In the first step, we estimate the Kaplan-Meier estimators for the whole sample, focusing on survival vs. non-survival dichotomy. This estimator yields a preliminary estimate of the mean (median) survival time of newly listed firms in Canada to 13.81 (15.08) years. **Figure 1** illustrates the effect of the listing requirements by using survival functions**.** The tests of significance of the effects of selected variables are reported in **Table 6** (Panel A).

To build **Figure 1**, we grouped issuers according to the NORM variable. As expected, issuers in the NORM4 group, which report positive earnings and shareholders' equity in excess of CAN$25 million, exhibit higher survival probability than the other issuers. The NORM3 group, with positive earnings but lower shareholders' equity than the NORM4 group, shows lower probability of success for each month, but the survival time is higher than for the two other groups. New issuers seem to incur a similar delisting risk when they report negative earnings at the IPO, regardless of whether they report revenues at this time. Apart from the longest maturity (167 months or more), the two curves are close and do not differ. Issuers reporting negative earnings constitute 71% of Canadian IPOs, and for exchanges to make profitability a listing requirement is probably an unacceptable proposition. Accordingly, the analysis of survival and success in this latter group is of particular interest.

Panel A of Table 6 shows that the delisting probability is significantly lower (37.87%) for an issuer with revenues at IPO than for issuers without revenues (61.37%). The mean delisting time increases from 12.88 years to 14.62 years when firms exhibit revenues at IPO. Issuers with positive earnings have a lower delisting rate (28.06%) than issuers with negative earnings (56.88%). The mean delisting time increases from 12.94 years to 15.99 years when companies report positive earnings at IPO. This result is consistent with the previous U.S. results linking the profitability of issuers to their survival and success. Moreover, the delisting probability is 12.5% for the largest profitable issuers. The p values indicate that the differences between the groups are highly significant.

We also analyze the survival functions for the time to success (Table 6, Panel B). The proportion of success is 16.32% (10.77%) for issuers with (without) revenues, and the mean time to success is 16.30 and 18.79 years respectively. The difference is significant, but smaller than one would expect. This is probably due to the large proportion of issuers with no revenues in the natural resources sectors, whose expansion allowed several companies to graduate. A similar pattern was observed with respect to profitability. The proportions of success are in the range of 15% to 17% in the groups based on NORM variables, except for NORM1 (10.77%). When a company reports revenues at IPO, the probability of success appears to be largely independent of profitability and size.

Insert figure 1 and table 6 about here.

This analysis of the survival functions evidences issuers' differences, which are mainly linked to the level of listing requirement they meet at IPO. The survival probability is significantly lower when the issuer has no revenues or negative earnings. However, as several variables are linked, only the simultaneous analysis of these variables can yield robust conclusions.

4.2.2) Semi-parametric models: time to failure

The results of the estimated Cox PH models are reported in **Table 7** for the survival analysis. The dependent variable is the logarithm of the hazard rate. In the context of **Table 7**, where the dependent variable is based on the delisting occurrence, a positive (negative) coefficient indicates that an increase in the variable leads to an increase (decrease) in the probability of delisting. We also report the risk ratios. For a dichotomous variable, this is the ratio of the hazard for "1" to the hazard for "0", while controlling for all other covariates. A risk ratio of 0.784 (for variable AGE2), for example, indicates that risk failure of an issuer aged 5 years or more is 78.4% of the failure risk of a younger firm, when controlling for other covariates (Allison 1995). We estimate four forms of the model. In model 1, we include all variables except those associated with the intermediaries. We introduce these variables in model 2, to assess their marginal contribution, because they are likely to be correlated with the NORM variables. In model 3 we split the sample according to profitability. In model 4, we isolate the issuers without revenues (NORM1).

Insert table 7 about here

The overall model Chi-square statistic indicates that all forms of the model are highly significant. The estimated coefficients and their levels of significance are stable across the various

specifications, and we focus our detailed analysis on Model 2. All variables are significant except the variables associated with the High Tech industry, the Hot issue market period and the VC-backed issuers. This overall result indicates that the survival of new issuers is significantly associated with the level of listing requirements they meet at IPO.

Financial conditions prevailing before the IPO, summarized in the NORM indicator, strongly influence the risk ratio. The coefficients of the dummy variables NORM1 (no revenues) and NORM2 (revenues and EPS<=0) are largely significant. The positive coefficient indicates that issuers included in these groups have a shorter life expectancy than the other issuers. If we group all non-profitable issuers (regardless of whether these issuers have revenues or not) the coefficient is still highly significant. The risk ratio indicates that the failure risk of non-profitable issuers is 1.77 times the failure risk of profitable issuers (model 3). The Chi square decreases to 199.70, which indicates that it is important to separate non-profitable issuers according to their revenue dimension to better capture the survival probability. This risk ratio is a direct measure of the additional delisting risks arising from the exchange and the regulator's eliminating the profitability requirement for new listings. In Model 4, we observe that the parameter associated with the no- revenue dummy variable is also positive and significant. The delisting risk of new issuers with no revenues is 1.23 times greater than the corresponding values for the other issuers, including those with revenues but negative earnings. We also test a model with a separation between NORM4 and the other groups, omitting the size variable (not reported). The coefficient associated with NORM4 is negative and highly significant. Issuers that approximate the recent NASDAQ minimal listing requirements exhibit a failure risk of 27.8% of that of the other issuers. This illustrates the significant role of minimal listing requirements on the survival of new issuers.

The coefficient of the LOGSIZE variable is negative and highly significant whatever the model: larger issuers have a lower failure risk. This is in line with expectations. The AGE2 (more than five years) variable is also negative and significant: older issuers have a lower failure risk than younger ones. The hazard risk ratio indicates that older issuers represent a failure risk of 78% relative to the younger ones.

In model 2, we add the PUND and PAUDIT variables, which are proxies for the prestige of the underwriter and the auditor. The Chi square increases to 217 from 204, which implies that underwriters and auditors are linked to the failure probability, beyond the other characteristics of the issuers. Hiring prestigious underwriters and auditors significantly decreases the failure risk,

all other things being equal. This result can be due to the consulting and monitoring functions of these practitioners or to their screening abilities. The hazard ratios of 0.847 and 0.807 for auditors and investment bankers indicates that the reduction in failure risk associated with the involvement of prestigious intermediaries is important. The VBIPO variable is significant at the 10% level only in model 3. When all variables are accounted for, VC involvement explains the failure rate of new issuers only marginally.

4.2.3) Semi-parametric models: time to success

In **Table 8**, we report the coefficient of the models that explain the time elapsed until success. A positive coefficient on an explanatory variable model indicates that an increase in the variable is associated with an increase in the hazard and consequently lower duration until graduation. The models are globally significant, but very few variables appear to receive a significant coefficient. Generally, the time to success is not significantly related to the NORM variables (models 1 to 4). The presence of revenues or positive earnings at IPO is not associated with the probability of graduation to a higher level market. This situation can be seen as a paradox. Our explanation is that the success of a large proportion of our sample is associated with a discovery in the case of the resources companies, or with a successful R&D program in the case of high technologies companies. Collectively, these two groups constitute approximately two thirds of our sample.

The coefficient of the LOGSIZE variable is highly significant and positive for all models. Larger IPO issuers have a higher success rate than smaller ones. This result makes sense, because access to a higher level market is generally based on size-related requirements. The other variables that influence the probability of graduating or cross-listing are associated with the sectors. The probability of success in Energy (Materials) is 2.6 (1.8) times that of the other sectors. This can be traced to the rising prices of natural resources during the last part of our period of analysis.

The probability of success is significantly higher for IPOs when a prestigious auditor is hired: the risk ratio is 1.8. Surprisingly, the opposite effect appears with the dummy variables associated with investment banker prestige. Here, the coefficient is negative and significant. One possible explanation can be the low involvement of prestigious investment bankers in natural resources companies. They are involved in 10.2% to 11.5% of these issues and in 25% of the issues in the other sectors, where the probability of graduation is lower.[24] The VBIPO variable is highly

[24] Doukas and Gonenc (2005) assert that the reputation of investment bankers matters only in the absence of VC. However, replicating the test while omitting the VBIPO variable does not influence the results.

significant. The risk ratio indicates that, all other things being equal, a VC-backed issuer is 1.8 times more likely to graduate (succeed) than a non-VC-backed issuer. This result is consistent with several previous studies indicating that VC-backed IPOs exhibit, on average, better long-run performance than non-VC-backed IPOs (Chou, Cheng and Chien 2006, Doukas and Gonenc 2005).

The IPO context influences the probability of success significantly. The coefficient of the DHOT variable, which indicates that the issue is launched during a Hot issue market period, is negative and highly significant. This indicates that these issues are less likely to succeed, a result consistent with the previous evidence related to the Hot-Cold phenomenon. The risk ratio indicates that the probability of graduation of an IPO introduced during a Hot issue market is 75% of the probability of such an outcome for an IPO launched during Cold and neutral periods.

Overall, few variables specific to the issuers can help to predict the success of an IPO. The certification effect of auditors and VC appears to be the only significant predictor of success, and this success depends on the general condition of the IPO market.

Insert table 8 about here

4.2.4) Sector effects

The difficulty in predicting success may be linked to industrial clustering. We observe a large proportion (58.76%) of NORM1 (without revenues) issuers located in the Materials sector. To assess the effects of this situation on our results, we report the results of Cox PH models 2 and 4 in **Table 9**, for all observations excluding Materials companies and for Materials issuers only.[25]

Table 9 shows that excluding Materials does not change the coefficients or their significance levels for the explanation of the time to failure. The total level of significance of the model is very close to the corresponding value in Table 8. In the Materials sector, the choice of prestigious intermediaries has no significant influence on the time to failure. The explanatory power is much lower than in the other sectors (17.24 vs. 203.29), reflecting the unpredictable nature of Materials company failure. The Hot-Cold dichotomy has no influence on the time to failure. Similar observations can be made regarding the models that explain the success probability. Exclusion of Materials does not change the estimated parameter or the significance levels, except for the coefficients of the variables associated with the intermediaries' prestige, for which the

[25] We introduce the dichotomy between non-revenue and revenue companies (NORM1) for natural resource issuers exclusively, owing to the concentration of the observations in the first group.

significance levels decrease considerably. As in the case of failure time, the probability of success in the Materials sector appears to be largely unpredictable. Even the dummy variable associated with the market condition (DHOT) has no significant influence on the outcome. However, this variable is significant in the non-Materials sectors. This analysis indicates that our results are not driven by the particular characteristics of the Materials sub-sector.

Insert table 9 about here

4.3) SUMMARY: A COST-BENEFIT ANALYSIS

We summarize our main empirical results in **Table 10**, where the IPO sample is split according to the NORM variable. Panel A summarizes the characteristics of the issues. Approximately 45% of the studied sample falls into the NORM1 group (without revenues). The majority of the gross proceeds are under CAN$1 million: the third quartile of the gross proceeds distribution is CAN$0.75 million. These issues are clearly done by micro caps, and fall well below the general standards for U.S. penny stocks. The natural resources sectors are overrepresented in this category. NORM2 and NORM3 issuers approximate the definition proposed by Bradley, Cooney, Dolvin and Jordan (2006) for penny stock IPOs in the U.S., apart from the stock price, which is much lower in Canada than in the U.S. Only 91 of these 885 issuers levied gross proceeds above CAN$8.85 million, which is roughly the minimal gross proceeds required by the European junior markets. Only the issues in the NORM4 group can be considered "regular," according to international norms, although they originate from small issuers. In terms of size, estimated by the gross proceeds or by the post-IPO market capitalization, these issues are in the same range as those described on the AIM by Derrien and Kecskes (2007).

In Panel B, we summarize the failure probability for each time frame and each group. Panel C provides similar information for success. These two sets of information provide us with sufficient data to estimate an economic indicator of the economic costs (or benefits) of lower listing requirements. When regulators and exchanges allows emerging firms to list at a pre-revenue stage, a cost of 4.24 failures is incurred for each success after 5 years, but this ratio increases to 14.59 at 10 years. It decreases after 10 years, because the proportion of success increases more quickly than the rate of failure. At the end of the period under analysis, the economic cost of admitting firms at a pre-revenue stage is 5.7 failures per success. We also provide the rate of success per failure in panel C: 0.18 successes per failure in the group without revenue, at the end

of the study period. The economic costs decrease sharply and are very similar for the NORM2 and NORM3 groups. For smaller firms, with shareholders' equity below CAN$25 million, the situation in terms of earnings has a limited impact on the economic cost indicator. At the end of the study period, the economic cost is 3 failures per success in the NORM2 group and 2.36 failures per success in the NORM3 group. The failure rate is slightly higher in the NORM2 group than in the NORM3 group, but the success rate is also higher in the NORM2 group. The higher rate of success of the non-profitable firms can probably be traced to the concentration of these firms in the natural resources and Energy sector, which has benefited from very positive conditions during the last 10 years of our analysis.

The economic benefits of new listings became positive for the NORM4 group. Mature companies exhibit a rate of success higher than their delisting rate. This table illustrates the strong effect of minimal listing requirements on the success, failure and economic costs of new listings.

Insert table 10 about here

CONCLUSION

We use the Canadian IPO market to analyze the potential effects of more rigorous listing requirements on the outcome of the IPO process. Canada is an appropriate investigation field, due to very low initial listing standards. The large majority of the new issues are micro or penny stock IPOs, and 45% of the issuers report no revenues. Only 11% of issuers would meet the level 2 standards of NASDAQ

The delisting rate of new issues in Canada is lower than in the U.S., despite the apparently poor quality of the new issuers and the weak involvement of venture capitalists. After 10 years, the delisting rate (28.29%) is more than 10 points lower than the corresponding rate reported by Fama and French for the smallest U.S. IPOs (40.50%). This situation is probably attributable to two factors. First, a Canadian company can easily issue private or public equity, even if it has not reached the profitability or even the sale stage. In this sense, the Canadian seasoned equity market is in sharp contrast with the U.S. market. The second explanation is the tolerance of the exchange in terms of delisting of non-operating companies. These two elements allow numerous firms to survive in the market and to finance their R&D or exploration expenses. This situation seems to indicate that a lowering of initial listing requirements is possible if the rules and practices in the secondary markets are also adjusted. However, we observe a sharp increase in the

delisting rate after 10 years and, overall, in 2007, a proportion of 54.08% of IPOs of the 1986 to 1996 years are considered non-surviving.

We use graduation to a higher level exchange as an indicator of success for new issuers. The probability and time to graduate has a weak relationship with the characteristics of the issuers at the IPO. Size and industry are the only significant variables to explain the success probability. However, if the involvement of a venture capitalist has only a marginal effect on the probability of failure, it influences the probability of success significantly. The same is true for the hiring of a prestigious auditor. We estimate the economic costs of lowering the minimal listing requirements by dividing the ratio of delisting to success for each group. We estimate a huge cost of 14.59 failures for each success (after ten years) for the group without revenues. This ratio is 0.79 for the profitable issuers with the largest assets, which underlines the strong effect of the listing requirements on the costs and benefits of new listings. The effects of the listing requirements seem to be significantly mitigated by the involvement of prestigious auditors and investment bankers. Even when all other covariates are controlled for, the delisting risk of an issue launched by a prestigious broker is subject to 81% of the delisting risk of the other issuers.

Our results have several implications for regulators and policy makers. First, allowing firms to enter the stock market at a pre-revenue stage is a perilous strategy. Only a small proportion of those issuers survive and few reach a higher level stock exchange. These firms probably enter the market too early. Second, when companies are able to finance their growth by subsequent private or public offerings before they reach the sale or profitability stage, allowing penny stock IPOs is not a more risky strategy than the restrictive strategy that prevails in the U.S. Canada seems to have developed a particular strategy to finance growing firms, which provides the main exchange with a continuous flow of new listings originating from the junior market. This financing strategy may be partly attributable to the specific characteristics of this market, in which natural resources companies represent a very large proportion of listed companies and capitalization. Finally, the choice of prestigious intermediaries influences the survival probability. We cannot determine if this effect results from a selection effect (better firms hire prestigious intermediaries) or whether knowledgeable intermediaries effectively provide valuable services and guidance to the issuers. This question, together with the effects of these listing requirement strategies on shareholder's wealth, has been left for further research.

TABLE 1 Summary of previous studies of the survival of new issues in the U.S. Size is indicated by Gross Product (GP), Market Capitalization (MC) or total assets (Asset) depending on the study. Years indicate the length of the period of analysis since the IPO.

	Sample (number, period of time)	Years	Median size U.S. $ Million	Proportion of issuers (%) Survival	Acquis.	Non-survival
United States						
Henser *et al.* (1997)	741, 1976-1984	10	5.82	44.9		***55.1****
Seguin and Moller (1997)	5,896 ; 1974-1988					
	Penny Stocks (less than $3)	5	NA			47.2
	Non-Penny Stock	5	NA			17.4
Schultz (1993)	797, 1986-1988					
	IPO	3	10.5 (GP)			11.1
	Units	3	3.6 (GP)			41.2
Dalbor and Sullivan (2005)	59 ; 1990-96 Micro Capitalization	na	25.96 (GP)			44
Jain and Kini (1999)	877, 1977-1990	6-19	23	65	17	14
Jain and Kini (2000)	877, 1977-1990	5	23			***25.5 – 29.9****
Fama and French (2004)	Small, 1980-1991	10	Inf NYSE median	37.8	21.7	40.5
	Big, 1980-1991	10	Sup NYSE median	61.5	26.3	12.2
Bhabra and Pettway (2003)	242, 1987-1991 Issue Price ≥ 1$	5	19.25	83.1	5.8	11.1
Weber and Willenborg (2003)	233, 1993-1994	2	6.38 (GP)			10.3
	GP ≤ $10 million	4	3.2 (Assets)			25.3
Li *et al.*(2006)	U.S. 1657 ; 1991-1999	2-11	129 (MC)			21.6
Demers and Joos (2007)	U.S. 3,973 1985-2000					
	Non-HT	5	101 (MC)			16.7
	High Tech	5	121.3 (MC)			9.2
Bradley *et al.* (2006)	1990-98					
	Penny Stocks (251)	3	5.7 (GP)			31.5
	Non-Penny Stocks (2707)	3	43.6 (GP)			6.4
van der Groot *et al.* (2007).	326 Internet, 1996 - 2001	5	64 (GP)	37.1	28.8	34.1
Chou *et al.* (2006)	2,059 ; 1991-2000, GP ≥$5 million.	5-15	35.16 (GP)			13.41
Other Countries						
Boubakri *et al.* (2005) Canada	431, TSE, 1995-1999	3-7	CAN$28.3 (survivors)	76.80	11.83	11.37
Ferris *et al*. (2007) Asian Markets	2,411, 1980-99	5				2.9

* In the studies indicated in bold, survivors are defined as firms that continue to operate independently as public corporations. Non-survivors include acquired and merged companies.

TABLE 2 Variable description and expected relations between probability of failure and probability of success between each explanatory variable. EPS means earnings per share. SE means shareholders' equity.

Variable	Description	Expected relationship, Failure	Expected relationship, Success
Listing requirements			
NORM1	1 if no revenues at IPO	+	-
NORM2	1 if revenues but EPS ≤0	+	-
NORM3	1 if EPS ≥ 0 and SE ≤ $25 million	-	+
NORM4	1 if EPS ≥ 0 and SE ≥ $25 million	-	+
NORM12	1 if EPS ≤0	+	-
NORM34	1 if EPS >0	-	+
NORM234	1 if revenues	-	+
Governance and intermediaries			
VBIPO	1 if VC significantly involved before the IPO (more than 10%)	-	+
PUND	1 if investment banker is prestigious	-	+
PAUDIT	P1 if auditor is prestigious	-	+
Control variables			
AGE1	1 if Age ≤ 5 years	+	-
AGE2	1 if Age >5 years	-	+
LOGSIZE	Ln post issues net assets	-	+
DHOT	1 if market is Hot	+	-
DCOLD	1 if market is Cold	-	+
DHT	1 if the issuer's industry is High Tech (including Biotech)		
DMAT	1 if the issuer's industry is Materials (mining)		
DEN	1 if the issuer's industry is Energy (Oil & Gas)		
OTHER	1 if the issuer's industry is other than High Tech, Materials and Energy.		

TABLE 3 Main characteristics of Canadian IPOs, by year and sub period, 1986-2003.

Period	#	Total GP in $M	Mean GP in $M	Median GP in $M	Median Issue Price	% HT	% NR	% REV0	% EPSN
1986	267	1,890.90	7.08	2.00	2.00	16.30	27.75	32.16	48.02
1987	365	2,325.90	6.37	0.48	0.75	12.16	45.61	50.34	73.99
1988	356	478.19	1.34	0.25	0.50	11.73	63.52	72.31	92.51
1989	199	593.51	2.98	0.28	0.45	10.98	54.88	75.00	91.46
1990	70	983.92	14.06	0.34	0.47	14.52	46.77	70.97	93.55
1991	49	521.57	10.64	0.49	0.50	12.50	50.00	53.13	75.00
1992	43	676.65	15.74	1.54	1.10	32.35	29.41	50.00	76.47
1993	142	3,709.88	26.13	10.48	5.50	27.48	40.46	13.74	37.40
1994	118	3,314.28	28.09	2.11	1.25	20.62	35.05	21.65	52.58
1995	89	665.61	7.48	1.35	1.00	31.34	40.30	35.82	68.66
1996	143	2,486.84	17.39	3.00	1.36	33.62	37.07	31.90	60.34
1997	187	4,354.63	23.29	1.60	0.85	26.62	44.16	33.12	68.83
1998	100	2,186.80	21.87	1.80	1.00	32.65	32.65	34.69	66.33
1999	68	1,185.29	17.43	2.04	0.98	35.82	26.87	26.87	71.64
2000	77	1,875.34	24.36	4.20	1.75	46.75	32.47	29.87	74.03
2001	32	208.65	6.52	1.56	1.00	31.25	50.00	40.63	68.75
2002	32	771.22	24.10	1.50	0.48	15.63	62.50	40.63	81.25
2003	36	570.67	15.85	1.79	0.45	14.29	71.43	62.86	85.71
1986-1990	1257	6,272.41	4.99	0.36	0.55	12.88	48.48	57.86	77.65
1991-1995	441	8,887.98	20.15	2.50	1.25	25.48	38.78	26.87	54.29
1996-2000	575	12,088.89	21.02	2.05	1.00	33.59	36.33	31.84	67.58
2001-2003	100	1,550.54	15.51	1.68	0.50	20.20	61.62	48.48	78.79
1986-2003	2,373	28,799.83	12.14	0.80	0.75	20.71	44.33	45.32	71.01

The sample consists of 2,373 firms making initial public offerings during the 1986-2003 period. These issues consist of common shares and other categories of securities (units comprising shares, preferred shares and flow-through shares). Fixed income securities, trust units, limited partnership units and shares resulting from demutualization and privatization are excluded. Gross proceeds (GP) are in CAN$ million ($M). Variable definitions are as follows: %HT is the percentage of High Tech issuers; %NR is the percentage of Materials and Energy issuers, %REV0 is the percentage of issuers without revenues and %EPSN is the percentage of issuers with negative EPS at the issue.

TABLE 4 Annual distribution of IPOs between 1986 and 2003, for which accounting data are available, by status on June 30, 2007 (Panel A), five years after the issue (Panel B) and ten years after the issue (Panel C).

	Non-Surviving		Surviving unsuccessful		Surviving Success		Total Surviving		Total
	NB	%	NB	%	NB	%	NB	%	NB
Panel A: whole sample									
1986	108	47.58	92	40.53	27	11.89	119	52.42	227
1987	187	63.18	80	27.03	29	9.80	109	36.82	296
1988	212	69.06	63	20.52	32	10.42	95	30.94	307
1989	107	65.24	36	21.95	21	12.80	57	34.76	164
1990	45	72.58	13	20.97	4	6.45	17	27.42	62
1991	15	46.88	16	50.00	1	3.13	17	53.13	32
1992	12	35.29	19	55.88	3	8.82	22	64.71	34
1993	29	22.14	81	61.83	21	16.03	102	77.86	131
1994	41	42.27	38	39.18	18	18.56	56	57.73	97
1995	30	44.78	26	38.81	11	16.42	37	55.22	67
1996	43	37.07	49	42.24	24	20.69	73	62.93	116
1997	51	33.12	76	49.35	27	17.53	103	66.88	154
1998	36	36.73	47	47.96	15	15.31	62	63.27	98
1999	25	37.31	28	41.79	14	20.90	42	62.69	67
2000	26	33.77	38	49.35	13	16.88	51	66.23	77
2001	11	34.38	11	34.38	10	31.25	21	65.63	32
2002	5	15.63	22	68.75	5	15.63	27	84.38	32
2003	1	2.86	29	82.86	5	14.29	34	97.14	35
Total	984	48.52	764	37.67	280	13.81	1,044	51.48	2,028

Table 4, continued

	Non-Surviving		Surviving no success		Surviving Success		Total Surviving		Total
	NB	%	NB	%	NB	%	NB	%	NB
Panel B: 5 years									
1986	16	7.05	204	89.87	7	3.08	211	92.95	227
1987	31	10.47	262	88.51	3	1.01	265	89.53	296
1988	40	13.03	260	84.69	7	2.28	267	86.97	307
1989	14	8.54	143	87.20	7	4.27	150	91.46	164
1990	7	11.29	55	88.71	0	0.00	55	88.71	62
1991	4	12.50	27	84.38	1	3.13	28	87.50	32
1992	2	5.88	31	91.18	1	2.94	32	94.12	34
1993	1	0.76	112	85.50	18	13.74	130	99.24	131
1994	6	6.19	78	80.41	13	13.40	91	93.81	97
1995	6	8.96	53	79.10	8	11.94	61	91.04	67
1996	13	11.21	88	75.86	15	12.93	103	88.79	116
1997	18	11.69	119	77.27	17	11.04	136	88.31	154
1998	20	20.41	67	68.37	11	11.22	78	79.59	98
1999	17	25.37	39	58.21	11	16.42	50	74.63	67
2000	22	28.57	47	61.04	8	10.39	55	71.43	77
2001	9	28.13	14	43.75	9	28.13	23	71.88	32
2002	3	23.08	9	69.23	1	7.69	10	76.92	13
Total	229	11.60	1,608	81.46	137	6.94	1745	88.40	1,974
Panel C: 10 years									
1986	42	18.50	178	78.41	7	3.08	185	81.50	227
1987	85	28.72	208	70.27	3	1.01	211	71.28	296
1988	103	33.55	197	64.17	7	2.28	204	66.45	307
1989	51	31.10	106	64.63	7	4.27	113	68.90	164
1990	17	27.42	45	72.58	0	0.00	45	72.58	62
1991	7	21.88	24	75.00	1	3.13	25	78.13	32
1992	8	23.53	25	73.53	1	2.94	26	76.47	34
1993	16	12.21	97	74.05	18	13.74	115	87.79	131
1994	34	35.05	50	51.55	13	13.40	63	64.95	97
1995	27	40.30	32	47.76	8	11.94	40	59.70	67
1996	43	37.07	58	50.00	15	12.93	73	62.93	116
1997	21	29.17	43	59.72	8	11.11	51	70.83	72
Total	454	28.29	1,063	66.23	88	5.48	1,151	71.71	1,605

Sources: Financial post, FPInformart.ca, Corporate retriever, Sedar and Internet.

TABLE 5 Descriptive statistics on independent variables, by status on June 30, 2007 for 2,028 IPOs between 1986 and 2003 for which accounting data are available. SE means shareholders' equity. Description of independent variables is provided in Table 2.

	Non-Surviving		Surviving unsuccessful		Surviving Success		Surviving Total		Total	
Panel A: Main characteristics										
	mean	median	mean	Median	mean	median	mean	median	mean	median
Issue Price	1.52	0.55	4.55	1.63	4.36	1.25	4.50	1.50	3.06	0.85
Gross proceeds, in $M	3.62	0.50	25.51	3.00	16.28	2.50	23.03	3.00	13.61	0.94
Age at IPO	4.88	2.07	9.90	4.31	7.25	3.25	9.19	4.03	7.11	2.75
SE, in $M	10.55	0.17	21.48	0.98	14.31	0.69	19.56	0.88	15.19	0.31
Panel B: Independent variables										
	In %		In %		In %		In %		In %	
Profitability and norm										
NORM1 (no rev)	61.37		27.86		10.77		38.63		100.00	
NORM2 (rev, EPS<0)	48.94		34.74		16.31		51.06		100.00	
NORM3 (EPS>0, SE<=25)	37.64		46.43		15.93		62.36		100.00	
NORM4 (EPS>0, SE>25)	12.50		70.54		16.96		87.50		100.00	
NORM12 (EPS<0)	56.88		30.35		12.78		43.13		100.00	
NORM34 (EPS>0)	28.06		55.61		16.33		71.94		100.00	
NORM234 (rev)	37.87		45.81		16.32		62.13		100.00	
Sector										
High Tech	44.29		33.81		21.90		55.71		100.00	
Materials	55.33		33.70		10.97		44.67		100.00	
Energy	36.78		44.83		18.39		63.22		100.00	
Other	49.22		40.90		9.87		50.78		100.00	
Auditor										
Prestigious	38.27		41.15		20.58		61.73		100.00	
Non-prestigious	53.86		35.86		10.28		46.14		100.00	
Underwriter										
Prestigious	30.16		55.82		14.02		69.84		100.00	
Non-prestigious	52.73		33.52		13.76		47.27		100.00	
Venture capitalists										
Non-VC-backed issuers	50.56		36.80		12.64		49.44		100.00	
VC-backed issuers	22.07		48.97		28.97		77.93		100.00	
Period										
Hot	54.45		33.42		12.13		45.55		100.00	
Cold	44.44		45.83		9.72		55.56		100.00	
Age										
AGE1 (<= 5 years)	56.60		30.64		12.76		43.40		100.00	
AGE2 (> 5 years)	32.50		51.62		15.88		67.50		100.00	

FIGURE 1 Survival curve for IPOs issuers by NORM

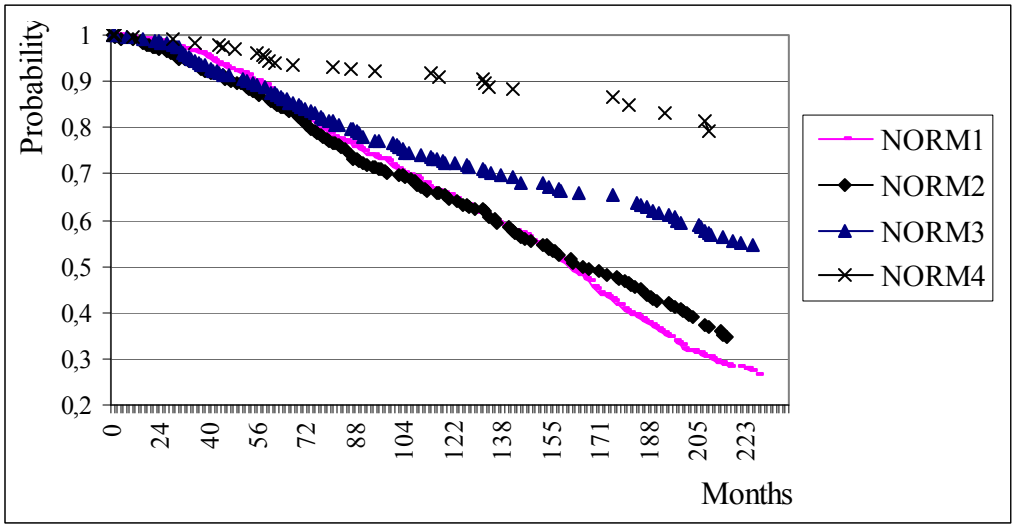

TABLE 6 Non-parametric analyses of the survival and time-to-success functions for 2,028 issuers of IPOs for the 1986-2003 period. EPS means earnings per share, SE means shareholders' equity. In Panel A, events are failures. In Panel B, events are successes.

Variables	Number of issuers	Mean Time (in years)	Number of events (percentage of events)	Test Log Rank (*p value*)
Panel A: Time to failure				
Revenues				
NORM1 Issuers without revenues	919	12.88	564 (61.37)	55.0177
NORM234 Issuers with revenues	1,109	14.62	420 (37.87)	(<0.0001)
EPS				
NORM12 Issuers with EPS <=0	1,440	12.94	819 (56.88)	102.9800
NORM34 Issuers with EPS > 0	588	15.99	165 (28.06)	(<0.0001)
Norms				
NORM1 Issuers without revenues	919	12.88	564 (61.37)	
NORM2 Issuers with revenues and EPS <=0	521	12.47	255 (48.94)	120.2473
NORM3 Issuers with EPS>0 and SE <= $25M	364	14.93	137 (37.64)	(<0.0001)
NORM4 Issuers with EPS>0 and SE > $25M	224	15.96	28 (12.50)	
Panel B : Time to success				
Revenues				
NORM1 Issuers without revenues	919	18.79	99 (10.77)	17.8137
NORM234 Issuers with revenues	1,109	16.30	181 (16.32)	(<0.0001)
EPS				
NORM12 Issuers with EPS <=0	1,440	18.35	184 (12.78)	5.9273
NORM34 Issuers with EPS > 0	588	15.23	96 (16.33)	(0.0149)
Norms				
NORM1 Issuers without revenues	919	18.79	99 (10.77)	
NORM2 Issuers with revenues and EPS <=0	521	16.35	85 (16.31)	18.8314
NORM3 Issuers with EPS>0 and SE <= $25M	364	15.48	58 (15.93)	(0.0003)
NORM4 Issuers with EPS>0 and SE > $25M	224	14.81	38 (16.96)	

TABLE 7 Coefficient estimates and p-values from multivariate Cox Hazard Models, time to failure. Hazard (risk) ratios appears between brackets

Variables	IPO-Model 1	IPO- Model 2	IPO-Model 3	IPO- model 4
NORM1	1.3673***	1.2980***		0.2052***
	(<0.0001) [3.925]	(<0.0001) [3.662]		(0.0095) [1.228]
NORM2	1.2827***	1.2410***		
	(<0.0001) [3.606]	(<0.0001) [3.459]		
NORM3	0.9013***	0.8312***		
	(<0.0001) [2.463]	(0.0001) [2.296]		
NORM12			0.5725***	
			(<0.0001) [1.773]	
PAUDIT		-0.1661**	-0.1439*	-0.1367*
		(0.0319) [0.847]	(0.0615) [0.866]	(0.0764) [0.872]
PUND		-0.2149**	-0.3015***	-0.3002***
		(0.0381) [0.807]	(0.0033) [0.740]	(0.0034) [0.741]
VBIPO		-0.2835	-0.3131*	-0.2827
		(0.1316) [0.753]	(0.0946) [0.731]	(0.1319) [0.754]
LOGSIZE	-0.0659***	-0.0489***	-0.0657***	-0.0965***
	(0.0001) [0.936]	(0.0078) [0.952]	(0.0002) [0.936]	(<0.0001) [0.908]
AGE2	-0.2563***	-0.2436***	-0.2654***	-0.3283***
	(0.0020) [0.774]	(0.0033) [0.784]	(0.0014) [0.767]	(<0.0001) [0.720]
DMAT	-0.3019***	-0.3307***	-0.3119***	-0.2751***
	(0.0002) [0.739]	(<0.0001) [0.718]	(0.0001) [0.732]	(0.0009) [0.760]
DEN	-0.5073***	-0.5482***	-0.5289***	-0.4803***
	(<0.0001) [0.602]	(<0.0001) [0.578]	(<0.0001) [0.589]	(<0.0001) [0.619]
DHT	-0.0165	0.0093	0.0146	0.0842
	(0.8590) [0.984]	(0.9208) [1.009]	(0.8753) [1.015]	(0.3635) [1.088]
DHOT	-0.0876	-0.0786	-0.0665	-0.0694
	(0.1910) [0.916]	(0.2410) [0.924]	(0.3213) [0.936]	(0.3000) [0.933]
Chi-Square	203.5187***	216.7786***	199.6956***	174.9608***
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)

Cox Proportional Hazard models are estimated using a sample of 2,028 IPOs over the 1986-2003 period. The time to failure is measured as the number of months elapsed between the IPO month and the month in which the firm is delisted from TSXV for negative reasons. The results for each model include the estimated coefficient of each independent variable, the associated p-values in parentheses ( ) and the risk ratio between brackets [ ]. The description of independent variables is provided in Table 2. NORM1 is a dummy variable equal to one if the issuer has no revenues, NORM2 is equal to one if the issuer has revenues and earning per share (EPS) is negative, NORM3 is equal to one if the issuer has positive EPS and shareholders' equity of less than CAN$25 million, NORM12 is equal to one if the issuer has negative EPS. PAUDIT is an indicator variable equal to one if the firm hired a prestigious audit firm. PUND is an indicator variable equal to one if the firm hired a prestigious underwriter firm. LOGSIZE is defined by the natural logarithm of the post-IPO net assets. AGE2 is a dummy variable equal to 1 if the firm is more than five years old. DMAT is a dummy variable set as 1 if the industry of an issuer is Materials, DEN is a dummy variable set as 1 if the industry of an issuer is Energy and DHT is a dummy variable set as 1 if the issuer produces high-tech products based on the SIC identification and 0 otherwise.

TABLE 8 Coefficient estimates from multivariate Cox Hazard Models, time to success

Variables	IPO-Model 1	IPO- Model 2	IPO-Model 3	IPO- model 4
NORM1	0.2555	0.0950		-0.0683
	(0.3396) [1.291]	(0.7240) [1.100]		(0.6785) [0.934]
NORM2	0.4191*	0.2200		
	(0.0705) [1.521]	(0.3476) [1.246]		
NORM3	0.3062	0.0736		
	(0.1864) [1.358]	(0.7563) [1.076]		
NORM12			0.1258	
			(0.4161) [1.134]	
PAUDIT		0.5979***	0.6041***	0.6093***
		(<0.0001) [1.818]	(<0.0001) [1.830]	(<0.0001) [1.839]
PUND		-0.4198**	-0.4405**	-0.4252**
		(0.0188) [0.657]	(0.0116) [0.644]	(0.0149) [0.654]
VBIPO		0.5804***	0.5883***	0.5820***
		(0.0020) [1.787]	0.0017 [1.801]	(0.0019) [1.790]
LOGSIZE	0.2083***	0.1669***	0.1680***	0.1508***
	(<0.0001) [1.232]	(<0.0001) [1.182]	(<0.0001) [1.183]	(<0.0001) [1.163]
AGE2	-0.0028	0.0287	0.0360	0.0125
	(0.9840) [0.997]	(0.8337) [1.029]	(0.7918) [1.037]	(0.9267) [1.013]
DMAT	0.5015***	0.5701***	0.5240***	0.5924***
	(0.0108) [1.651]	(0.0042) [1.768]	(0.0054) [1.689]	(0.0029) [1.808]
DEN	0.8608***	0.9436***	0.9445***	0.9632***
	(<0.0001) [2.365]	(<0.0001) [2.569]	(<0.0001) [2.572]	(<0.0001) [2.620]
DHT	0.9304***	0.8167***	0.8292***	0.8523***
	(<0.0001) [2.536]	(<0.0001) [2.263]	(<0.0001) [2.291]	(<0.0001) [2.345]
DHOT	-0.2793***	-0.2872***	-0.2852***	-0.2875***
	(0.0235) [0.756]	(0.0206) [0.750]	(0.0204) [0.752]	(0.0204) [0.750]
Chi-Square	101.5737***	136.2641***	135.6040***	135.1125***
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)

Cox Proportional Hazard models are estimated using a sample of 2,028 IPOs over the 1986-2003 period. The time to success is measured as the number of months elapsed between the IPO month and the month in which the firm graduated to a senior exchange. The results for each model include the estimated coefficient of each independent variable, the associated *p*-values in parentheses ( ) and the risk ratio between brackets [ ]. The description of independent variables is provided in Table 2. NORM1 is a dummy variable equal to one if the issuer has no revenues, NORM2 is equal to one if the issuer has revenues and earning per share (EPS) is negative, NORM3 is equal to one if the issuer has positive EPS and shareholders' equity of less than CAN$25 million, NORM12 is equal to one if the issuer has negative EPS. PAUDIT is an indicator variable equal to one if the firm hired a prestigious audit firm. PUND is an indicator variable equal to one if the firm hired a prestigious underwriter firm. LOGSIZE is defined by the *natural logarithm* of the post-IPO net assets. AGE2 is a dummy variable equal to 1 if the firm is more than five years old. DMAT is a dummy variable set as 1 if the industry of an issuer is Materials, DEN is a dummy variable set as 1 if the industry of an issuer is Energy and DHT is a dummy variable set as 1 if the issuer produces high-tech products based on the SIC identification and 0 otherwise.

TABLE 9 Coefficient estimates from multivariate Cox Hazard Models, time to failure and time to success, by industry. MAT means Materials (mining) sector.

Variables	Time to failure IPO-Model All sectors but MAT	Time to failure IPO- Model MAT	Time to success IPO-Model All sectors but MAT	Time to success IPO- Model MAT
NORM1	1.1560**	0.3271**	-0.0847	0.4664
	(<0.0001) [3.177]	(0.0394) [1.387]	(0.7757) [0.919]	(0.2104) [1.594]
NORM2	1.1586***		0.1612	
	(<0.0001) [3.185]		(0.5127) [1.175]	
NORM3	0.7128***		0.0757	
	(0.0013) [2.040]		(0.7575) [1.079]	
PAUDIT	-0.1618*	-0.2393	0.5847***	0.5374*
	(0.0709) [0.851]	(0.1242) [0.787]	(<0.0001) [1.794]	(0.057) [1.712]
PUND	-0.2215*	-0.2099	-0.3988**	-0.5937
	(0.0750) [0.801]	(0.2633) [0.811]	(0.044) [0.671]	(0.1715) [0.552]
VBIPO	-0.2849		0.5368***	
	(0.1374) [0.752]		(0.0053) [1.710]	
LOGSIZE	-0.0784***	0.0240	0.1444***	0.2601***
	(0.0002) [0.925]	(0.5205) [1.024]	(0.0022) [1.155]	(0.0027) [1.297]
AGE2	-0.1514	-0.3784**	-0.0332	0.2632
	(0.1333) [0.859]	(0.0151) [0.685]	(0.8284) [0.967]	(0.3661) [1.301]
DEN	-0.5423***		0.8992***	
	(<0.0001) [0.581]		(<0.0001) [2.458]	
DHT	-0.0054		0.7879***	
	(0.9541) [0.995]		(<0.0001) [2.199]	
DHOT	-0.0272	-0.1564	-0.2998***	-0.2333
	(0.7434) [0.973]	(0.1698) [0.855]	(0.0365) [0.741]	(0.3524) [0.792]
Chi-Square	203.2994***	17.2384***	104.1565***	22.7459***
	(<0.0001)	(0.0084)	(<0.0001)	(0.0009)

Cox Proportional Hazard models are estimated using a sample of 2,028 IPOs over the 1986-2003 period. The time to failure is measured as the number of months elapsed between the IPO month and the month in which the firm is delisted from TSXV for negative reasons. The time to success is measured as the number of months elapsed between the IPO month and the month in which the firm graduated to a senior exchange. The results for each model include the estimated coefficient of each independent variable, the associated *p*-values in parentheses ( ) and the risk ratio between brackets [ ]. The description of independent variables is provided in Table 2. NORM1 is a dummy variable equal to one if the issuer has no revenues, NORM2 is equal to one if the issuer has revenues and earning per share (EPS) is negative, NORM3 is equal to one if the issuer has positive EPS and shareholders' equity of less than CAN$25 million, NORM12 is equal to one if the issuer has negative EPS. PAUDIT is an indicator variable equal to one if the firm hired a prestigious audit firm. PUND is an indicator variable equal to one if the firm hired a prestigious underwriter firm. LOGSIZE is defined by the *natural logarithm* of the post-IPO net assets. AGE2 is a dummy variable equal to 1 if the firm is more than five years old. DEN is a dummy variable set as 1 if the industry of an issuer is Energy and DHT is a dummy variable set as 1 if the issuer produces high-tech products based on the SIC identification and 0 otherwise.

TABLE 10 Summaries of IPO characteristics by groups based on theoretical minimal listing standards. EPS means earnings per share. SE means shareholders' equity. SE is in CAN$ million ($M).

Panel A: Characteristics		Issue Price			Gross proceeds, in $M		
Norm level	Nb	Q1	Med.	Q3	Q1	Med.	Q3
NORM1: no revenues	919	0.35	0.50	0.75	0.23	0.36	0.75
NORM2: revenues but EPS<=0	521	0.50	1.00	2.03	0.50	1.25	4.65
NORM3: EPS>0 & SE<=$25M	364	1.00	2.75	5.33	1.50	4.39	8.85
NORM4: EPS>0 & SE>$25M	224	8.00	10.63	13.75	24.08	38.16	72.42
NORM12: EPS<=0	1440	0.40	0.50	1.10	0.25	0.50	1.50
NORM34: EPS>0	588	2.00	5.50	10.00	2.90	10.00	28.95
All	2028	0.45	0.85	3.05	0.30	0.94	6.50

Panel B: Failure rates and time	Failure rate			median life exp.	Economic cost: Failure / success		
	% 5 y.	%10 y.	% 2007	month	% 5 y.	%10 y.	% 2007
NORM1: no revenues	11.91	32.29	61.37	132.67	4.24	14.59	5.70
NORM2: revenues but EPS<=0	13.86	30.43	48.94	119.26	1.35	4.15	3.00
NORM3: EPS>0 & SE<=$25M	11.33	25.73	37.64	145.08	1.41	3.16	2.36
NORM4: EPS>0 & SE>$25M	5.53	9.26	12.50	143.39	0.39	0.79	0.74
NORM12: EPS<=0	12.62	31.69	56.88	126.01	2.29	8.18	4.45
NORM34: EPS>0	9.15	20.04	28.06	144.66	0.88	2.14	1.72
All	11.60	28.29	48.52	131.96	1.67	5.16	3.51
Panel C: Failure rates and time	Success rates			median time to	Success / failure		
	% 5 y.	%10 y.	% 2007	success	% 5 y.	%10 y.	% 2007
NORM1: no revenues	2.81	2.21	10.77	80.46	0.24	0.07	0.18
NORM2: revenues but EPS<=0	10.30	7.34	16.31	38.47	0.74	0.24	0.33
NORM3: EPS>0 & SE<=$25M	8.01	8.14	15.93	59.20	0.71	0.32	0.42
NORM4: EPS>0 & SE>$25M	14.29	11.73	16.96	11.10	2.58	1.27	1.36
NORM12: EPS<=0	5.52	3.87	12.78	66.71	0.44	0.12	0.22
NORM34: EPS>0	10.36	9.38	16.33	30.00	1.13	0.47	0.58
All	6.94	5.48	13.81	55.41	0.60	0.19	0.28

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