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# **The Indirect Costs of Venture Capital in Canada**

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# The Indirect Costs of Venture Capital in Canada<sup>\*</sup>

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## **Résumé / Abstract**

Certains analystes et décideurs politiques considèrent que la croissance des nouvelles entreprises technologiques est contrainte par une offre insuffisante de capital. Au Canada, comme dans d'autres juridictions, les pouvoirs publics sont intervenus pour corriger cette lacune des marchés en augmentant l'offre de capital. Toutefois, la plupart des chercheurs défendent que cette lacune est essentiellement due aux problèmes d'asymétrie informationnelle, qui touchent particulièrement les entreprises technologiques. Les problèmes d'agence et d'anti-sélection qui en découlent rendent l'obtention de capital longue et coûteuse. Dans la présente étude, nous étudions les coûts et délais associés à l'obtention de capital de risque par douze entreprises technologiques, au cours de 18 rondes de financement distinctes. L'étude est menée au Québec, où l'offre de capital de risque est particulièrement abondante. Nous observons que les coûts associés à l'obtention du capital sont considérables et de nature à pénaliser les entreprises, notamment au cours des rondes initiales de financement. L'intervention gouvernementale classique, qui consiste à augmenter l'offre de capital, semble donc largement inefficace. D'autres types d'intervention, qui viseraient à encadrer et aider les dirigeants dans la recherche de fonds, devraient être étudiés.

**Mots clés** : capital de risque, coûts indirects, financement, PME, politique publique

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*Some analysts and policy makers consider that the growth of New Technology Based Firms (NTBF) is impeded by an insufficient supply of capital. In Canada, as in other jurisdictions, the public authorities have interceded to fill this equity gap by increasing the supply of funds. However, several researchers contend that this gap is mainly associated with information asymmetry that particularly affects technological firms. Agency and moral hazard problems explain why it can be time consuming and costly to get outside equity. We propose the first analysis of these indirect costs of financing. These costs are partially intangible and can be determined only through a field survey and case analyses. In this study, we identify the elements that generate indirect costs of financing and estimate the costs and time frames associated with 18 financing rounds undertaken by 12 NTBF in Quebec, where the supply of venture capital is very abundant. We show that these costs are indeed substantial and heavily penalize small companies, especially during the initial financing round and prior to the commercialization phase. Thus, the classic government intervention policies intended to increase the supply of funds may be largely ineffectual. More specific training and support actions would likely be more effective.*

**Keywords:** *financing, indirect costs, public policy, SME, venture capital*

## INTRODUCTION

Some analysts and policy makers consider that the growth of New Technology Based Firms (NTBF) is impeded by an insufficient supply of capital (HM Treasury 2003), which can justify government intervention, mainly at the seed/early stage levels of investment (see Lawton, 2002, for an analysis). As in the USA and several European countries, the public authorities in Canada have interceded to fill the equity gap by increasing the supply of funds. The intervention mode ensues from a binary vision, which prompted Harding (2002) to define the equity gap as the number of SME that do not or cannot access venture capital finance (p.60). In this context, NTBF are subject to an absolute financing constraint, which is translated by the inability to obtain sufficient capital. However, researchers do not unanimously affirm the existence of this market failure (Brierley 2001); several authors argue that the problem is not situated on the capital supply side (Mason and Harrison 2002). In effect, financing difficulties seem to be mainly associated with information asymmetry that particularly affects technological firms. Harding (2002) argues that *the equity gap is the measurable outcome of a much deeper problem of information asymmetries (...) that arise from the fact that neither the supplier nor the recipients of equity based finance are aware of the sensitive balance between risk and return.*

The present study posits that firm financing constraints are mainly attributable to the fact that the principal-agent relationship suffers from the market failure of information asymmetry (Lean and Tucker 2001). In this context, the problematic of access to financing is not binary. Information asymmetry and the problems of agency and moral hazard can be partly solved, albeit at a potentially exorbitant cost. These costs are notably linked to the search for and validation of information, together with control of suboptimal behaviour resulting from asymmetry. We explore the problem of financing constraints in the perspective of the monetary conditions of

access to capital. The objective of this study is therefore to measure the cost of obtaining funds for growing technology firms, in a market where there is clearly no shortage of venture capital.

Very few works have examined the costs and financing conditions of NTBF, despite the crucial dimension of this problematic. The rate of return required by venture capital investors is high, owing to the substantial risk inherent in this type of investment and the lack of diversification (Kerins *et al.* 2004), particularly during the early phases of financing (Manigart *et al.* 2002). The European Investment Bank (Christofidis and Debande 2001) evaluates the required rates at over 60% for firms in the start-up phase and at 35% to 40% for established companies. Nonetheless, these costs are only one of the components of the total financing cost. The second component, indirect financing costs, is associated with the various expenses that a firm must incur to obtain funding. Often, these costs reduce the financing amount obtained and thus increase the total financing cost<sup>1</sup>. In the case of NTBF, these indirect costs should be high, because the capital supplier must 1) partly fill the information gap and 2) protect itself from moral hazard phenomena associated with the fact that it is difficult to effectively monitor and control the actions of executives. This financing restriction has significant ramifications for both the venture capital industry and policy makers. If these costs represent a significant barrier and are effectively associated with asymmetry phenomena, they cannot be mitigated by an increase in the supply of capital. Hence, the classic intervention policies would be largely ineffectual.

However, these indirect costs are not easy to estimate. According to Timmons and Spinelli (2004): *(...) entrepreneurs tend to grossly underestimate the real costs of getting the cash in the bank. Further, entrepreneurs also underestimate the real time, effort, and creative energy*

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<sup>1</sup> If it costs 20% to obtain financing with a direct cost of 30%, the total financing cost increases to 37.50% ( $0.30/(1-0.20) = 0.375$ ).

*required. Indeed, the degree of effort fund raising requires is perhaps the least appreciated aspect in obtaining capital. In both these cases, there are opportunity costs in expending these resources in a particular direction when both the clock and the calendar are moving.* To the best of our knowledge, this is the first study to attempt to estimate all of the indirect costs of financing small private companies. Given the partly intangible nature of indirect costs and their analysis within private companies, the study was conducted by means of structured interviews carried out at a limited number of companies. The first section reviews the conceptual elements and market characteristics that generate indirect costs. The second section establishes a nomenclature of indirect costs, according to the steps of the financing round. In the third section, estimates are presented, and we attempt to explain the differences observed. We analyse the results of our estimates in relation to public policy in the conclusion.

## **1. INDIRECT COSTS AND FINANCING OF PRIVATE COMPANIES**

Several non-independent elements collectively generate high indirect costs of financing for expanding companies: risk, size, information asymmetry and market structure.

### **1.1 RISK**

Young companies that are growing vigorously represent a high risk. Industry Canada (IC, 2001, p.14) situates one of the four market gaps here: *the risk gap, resulting from a general unwillingness of conventional lenders to provide financially riskier loans even at higher interest rates.* Restricted bank credit obliges companies to combine several financing sources. Putting in place the resulting financing packages is a long and costly process. For a single project, several files must be presented and defended, and the firm must reconcile the expectations and

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constraints of diverse stakeholders. For instance, venture capitalists act in syndicates, and banks use guarantee mechanisms put in place by governments. In a single financing file valued at over C\$1 million, it is not exceptional to encounter two or even three venture capitalists, a lender, a subsidizing agency and a loan guarantee agency, in addition to one or more private investors. Substantial indirect costs are then linked to file preparation, the negotiation process and the necessary recourse to professionals in several fields. The high risk also leads lenders to demand sizeable guarantees.

## **1.2 SIZE**

The amounts solicited by NTBF are often small. For institutions, the analysis and follow-up of such files are proportionately more costly. IC (2001) describes the second *gap* as: *the size gap, resulting from the higher relative costs involved in preparing and assessing small-amount business loans*. Costs resulting from the production and auditing of the shareholder agreement and financial statements, or those associated with the *due diligence process*, are partly fixed and therefore proportionately larger when the amount requested is limited. For venture capitalists, small investments made at an early stage represent an additional risk and cost, and comprise only a minimal proportion of their operations (Murray 1999).

## **1.3 INFORMATION ASYMMETRY**

Information asymmetry exists in most small companies, where key information is not easily accessible to external stakeholders (Denis 2003). The information in question pertains to the real financial situation of the company, the nature and level of development of technology and the potential of products and procedures. It is also linked to executives' motivations for spurring the development of the company. Some uncertainty may be partly dispelled, e.g. production of audited financial statements reduces asymmetry relative to the financial situation. The problem of

asymmetry is particularly acute for technological firms, for which it is the predominant factor that penalizes financing possibilities (Berger and Udell 1998). Bollingtoft *et al.* (2003) note that the more complex the technology, the more difficult it is for an external investor to assess the level of risk and the more difficult it is for the firm to obtain financing. Moreover, asymmetry generates agency costs, that is suboptimal behaviour by management to the detriment of shareholders.

Venture capitalists attempt to reduce asymmetry through various mechanisms whose cost is mainly assumed by the funding requester: audit of financial statement, due diligence, request for several business plans and detailed projections. Prolonging the negotiation process can also yield more precise information, while staging is another method that can reduce asymmetry. These mechanisms engender costs and delays for companies. Efforts to control agency problems also incur costs not only during negotiations but also after financing is disbursed. The most evident cost is related to the shareholder agreement, whereby the investor attempts to control all behaviours considered sub-optimal. This agreement triggers production costs, and its application can also penalize the company. Practices such as guarantee deposits also constitute attempts by executives to control the financing process.

Conversely, financing operations may increase in complexity when executives do not know or understand the mechanisms and requirements of financing by external capital, in particular venture capital. They may then submit unrealistic demands or incomplete and insufficient files. In both cases, this asymmetric situation potentially generates additional costs and delays. The existence of this form of asymmetry suggests that files managed wholly or partly by people that are knowledgeable about venture capital financing should be associated with lower costs. The control aversion phenomenon (Cressy and Olofson 1997; Berggren *et al.* 2000) and the inability to effectively negotiate financing terms (Mason and Harrison 2002) are also likely to inflate

negotiating costs. Thus, executives that are better trained and more familiar with the rules of external capital financing should be able to achieve greater savings.

#### **1.4 MARKET STRUCTURE**

In a competitive market, capital suppliers should strive to reduce costs and negotiation times to attract the best projects. Competitiveness in the risk capital market may easily erode owing to the practice of syndication. If a company lacks real alternatives, it may incur significant additional costs, because capital providers hold discretionary power and may unduly prolong the time required to obtain financing.

## **2. NOMENCLATURE OF INDIRECT COSTS**

We differentiate the steps of preparation, partner search, due diligence procedure, protection of intellectual property,<sup>2</sup> analysis, negotiation and closing. These steps generate non-recurring costs. After closing of the financing round, recurring costs emerge, related to control procedures, for example, or to mechanisms linked to the shareholder agreement.

### **2.1 SETTING UP THE FILE**

Preparation includes an effort to comply with standards, particularly in terms of internal and accounting practices. It also requires the production of a complete business plan, which satisfies potential investors. Consequently, projections must be generated, and a market analysis performed. In some cases, the company must solicit external expertise, particularly to produce commercial studies, i.e. external reports on competitive positioning, to justify the market to future

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<sup>2</sup> Actions related to protection of intellectual property (patents) are normally necessary in all cases, even if financing is internal. However, as it is practically impossible to obtain capital financing without this protection, we consider this cost an indirect financing cost. Note, however, that we isolate it in the discussion of the results.

investors. The firm must also determine the investments and justify the amounts required, which implies requests for external reports and estimates. These costs should be greater during the initial round of financing. In subsequent rounds, the mechanisms in place can be used, and the information simply updated. This initial round also includes, for executives, a phase of learning negotiation mechanisms. The time spent preparing the initial round should therefore be significantly longer than that dedicated to the following rounds.

## **2.2 SEARCH FOR INVESTORS**

This step is difficult. The manager has to contact a lot of venture capital companies (VCC) and then to participate a large number of meetings before reaching an agreement. According to Steier and Greenwood (1995), attracting the first investor is a major hurdle. The rejection rate is very high (Powell et al., 2002). According to Berlin (1998, p.19): *A single partner will receive 100 proposals per year, but most will be dismissed after a cursory look. Perhaps 10 of the initial 100 proposals will reach the stage where two of the firm's partners examine the deal in detail, and of these 10, the assembled partners will agree to fund only one or two.* Boocok and Woods (1997) report an investment ratio of 1.46% (3 investments out of 206 assessed applications) for a UK venture fund. Consequently, the search for an investor will consume time and funds from the management team. Changes and additional documents may also be necessary. The costs of this phase also include expenses pertaining to travel, prospecting and meetings with investors.

## **2.3 DUE DILIGENCE PROCEDURE**

In technology sectors, investors and lenders will most often perform a due diligence analysis, the costs of which are generally assumed by the company. The cost of this audit depends on the complexity of the technology and of the company. During subsequent financing rounds carried

out with the same investors, this operation may not be repeated. A difference in cost between the initial round and following rounds can therefore be anticipated.

#### **2.4 PROTECTION OF INTELLECTUAL PROPERTY**

The company must procure the intellectual property rights to its technology, which may require negotiations if the research was partly conducted outside the company. It must also affirm its property rights by procuring patents to protect procedures or products developed. This process requires time, effort and funds. Even if companies often commonly register their patents as part of operations, a round of financing often implies that all possible patents be registered worldwide, which may incur additional costs.

#### **2.5 NEGOTIATION AND CONCLUSION OF FINANCING CONDITIONS**

If the results of the analysis are positive, the investor drafts a letter of offer or intention, which precedes negotiation of the terms and conditions of investment. This letter normally conditions the decisions of the other funders identified. However, although the letter indicates the total amount that can be granted, it does not specify the terms of the investment, which must be negotiated. This negotiation process concerns the valuation of the company stock, the related terms of financing (nature of securities, proportion of preferred shares, common shares and convertible debentures). The costs stem from appraisal of the company, charges required by investors, travel and meetings, including the costs related to discussions of terms and of the shareholder agreement. Moreover, the firm must engage in negotiations with subsidizing bodies, lenders and possibly guarantee agencies. Lastly, in many cases the company must concede particular instruments (e.g. stock options) that represent an additional cost that is difficult to estimate.

## **2.6 COSTS OF REORGANIZATION AND USE OF FUNDS**

The closing phase is when the funds are disbursed. Nonetheless, many agreement mechanisms generate tangible and intangible costs. These costs include appointment of external auditors, appointment of additional administrators, more frequent production of financial statements, formation of boards of directors and management committees requested by investors, general reorganization of internal departments of the company and interest on interim financing.

## **3. ESTIMATE OF INDIRECT COSTS OF FINANCING**

The various costs mentioned are not measurable based on financial statements, which incidentally are not available in the case of private companies. Only a field study conducted through interviews and charts can estimate these costs. This method allows collection of complete data, in particular estimation of intangible costs. However, it limits the number of cases that can be processed and thus reduces the possibilities of generalizing the results. Note that the study was conducted in a context of abundant risk capital.

### **3.1 Context**

Owing to massive government intervention, Canada, particularly Québec, is one of the world regions where venture capital is most abundant. According to Baygan (2003), Canada has one of the highest levels of venture capital investment as a share of GDP among OECD countries. The OECD (2003) ranked Canada third in the world in terms of venture capital investment. Approximately \$22.5 billion in funds were available in the industry in 2002, half of which were offered in Québec. The amount of venture capital available per inhabitant was then \$1,506,

compared with \$469 in the rest of Canada. In 2001, funds raised by the venture capital industry in Québec represented 1.31% of GDP, which was higher than the values observed in most developed countries. This situation results from numerous government interventions in this sector. The principal programmes are Labour-Sponsored Venture Capital Companies (Cumming and MacIntosh 2003; Ayayi 2004), the public venture capital fund (Innovatech) and several tax incentive programmes designed to promote private investment in ventures and small cap IPOs. The study was therefore conducted in a context of abundant supply of venture capital and active government intervention.

### **3.2 DATA COLLECTION AND SAMPLE**

We have constructed and validated a chart for tabulation of indirect financing costs, which lists the various cost factors studied, specific to each of the financing phases.<sup>3</sup> For companies that completed several rounds, the information related to each round was identified, if possible. The data was gathered as part of a process involving two or three steps. At an initial meeting between the research team and the executives of the firm, along with their finance and accounting managers, we presented the study objectives, the content of the charts and the data to be collected. The survey, which generally relies on accounting systems, was administered by the companies themselves. After the survey charts were returned to us, meetings took place in some cases to validate the estimates. The surveys were followed by open interviews, in which we gathered information related to the executives' perception of the negotiation process.

The study concerns 18 financing rounds made by 12 technological companies, mainly directed at venture capital companies. Three rounds are small initial public offerings (IPOs) whose gross proceeds are similar to those of the private placements obtained. These IPOs immediately

followed the venture capital financing rounds<sup>4</sup>. The summary description of the companies appears in the appendix. With one exception, where the company is still active but has no employees, all the companies in the sample experienced growth, which in three cases led to an initial public offering. We therefore studied viable companies, and our sample is thus not representative of the reality of growing technological companies as a whole.

### **3.3 INDIRECT COSTS OF FINANCING: OVERVIEW**

Table 1 presents the principal results for the 18 rounds of financing analysed. The average gross proceeds of the financing rounds analysed are C\$2 million (median of C\$1.4 million). Minimum financing obtained is C\$90,000 and maximum financing is C\$5.6 million. The first finding is that indirect costs of financing are on average sizeable. They represent 25% of financing obtained (median of 19%) and thus increase the total costs of financing significantly. The relative size of the costs is variable. The costs range from 3% to 71% of the amount raised.

Most often, the procedures leading to the final agreement lasted several months. Company 12 reported a 22-month lag between the start of negotiations of the round of financing and conclusion of the final agreement. On average, the rounds of negotiation lasted 13 months (median of 13 months). In the United States, Davila *et al.* (2003, p.696) show that the median time to first round of financing is six months and Collingsworth (1999, p.19) reports that *most venture capital funds typically take between four to six months to complete a deal*. This situation is detrimental to young companies. Executives perceived the delays and numerous requirements as a means for the venture capitalist to negotiate the most favourable agreement possible from

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<sup>3</sup> This chart is available on request from the authors, along with the details of the indirect financing costs.

<sup>4</sup> Because of lax listing requirements in Canada, IPOs can be initiated by very small companies. The median gross proceeds of IPOs in Canada are consequently less than C\$1 million. A specific version of the chart was produced for IPOs, which are characterized by distinctive expense items.

their perspective. The majority of executives consider that negotiations with the VCC are very difficult and that the market lacks competitiveness. The only exception (Company 4) concerns a particular situation in which the promoters supplied their own start-up capital of C\$1 million, and whose financing was then obtained primarily by an executive that was a former employee of a VCC.

### **3.4 Origins of costs**

Figure 1 illustrates the principal components of costs associated with the various rounds. One third of the costs originate from file set-up operations, whereas another third is associated with the negotiation process. Reorganization costs represent 13% of the total. In the case of smaller financing packages, often first round, most of the costs are related to preparing the file (table 1). In one extreme case, a company estimated that preparing the file cost nearly one third of the amount ultimately obtained. Time spent by executives represents a major component of these costs. In some cases, legal costs represent a major expense. It is worth asking whether it is reasonable to disburse C\$35,000 on legal fees to obtain financing of C\$300,000. This amount seems relatively fixed<sup>5</sup> (C\$30,000-C\$40,000) and diminishes only during the second round of financing. It is greater overall, but proportionally smaller for financing rounds valued at several millions of dollars. In terms of public policy, this observation indicates that providing firms with either direct aid or training in preparing files and negotiation can significantly reduce the cost of obtaining funds.

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<sup>5</sup> Two rounds were not closed and all the costs were not taken into account, particularly concerning legal expenses.

Table 2 breaks down the expenses according to whether they are allocated to external or internal resources. Two thirds of amounts disbursed in conjunction with financing requests are associated with external resources. These costs are largely allocated to experts in various fields, particularly the law. Nonetheless, some of the expenses are attributable to capital providers that ask the company to partly assume the costs of analyzing or auditing the file. Further, Table 2 shows that the proportion of internal costs is 35% or lower. This portion of the estimate is the most sensitive to measurement errors, because it rests on the estimate of the time allocated by the employees and executives of the company and on an estimate of their hourly cost. The measurement error of this cost component therefore does not substantially influence our total estimates.

### **3.5 Factors that explain indirect financing costs**

Four factors explain the differences between the relative levels of indirect costs. The first is size (Table 3). Financing packages valued at less than C\$500,000 incur an average of 36% in indirect costs (median of 27%), and the values are similar for financing packages of between C\$500,000 and \$1 million. Private financing rounds that exceed \$1 million cost on average 14%. These results illustrate the conjunction of two effects. Larger fund campaigns benefit from the fixed cost effect inherent in certain items, and generally entail subsequent rounds. A portion of the cost is thus already assumed during prior rounds.

The second explanatory factor is antecedence of the round (Table 4). On average, initial rounds generate costs of 28% whereas subsequent rounds generate costs of 23%. Some costs are not recurring, and the amounts raised increase with the financing rounds. However, the reduction is less than one would expect, because the following rounds often originate from different funders.

The third explanatory factor is linked to the executive's knowledge of the venture capital field, or that of their advisors (Table 5). Three of the executives had personal knowledge of this area and two others were supported by specialized organizations. In these situations, the costs (mean of 11%, median of 10%) are largely below the costs incurred by the executives that do not have such experience (average of 32%, median of 25%). One of the executives originated from a venture capital company and was therefore very well-versed in the mechanisms and functioning modes of these institutions.

Lastly, the fact that a company has begun to commercialize its products strongly influences indirect financing costs. One of the companies undertook negotiations to obtain external capital although it already had revenues (company 3) and two other firms' operations were advanced enough to incorporate a strategic partner (9 and 11). The research steps were financed by other companies or universities, and the promoters were able to finance the proof of concept and pre-marketing tests with their own funds. The corresponding indirect costs of financing are respectively 3.4%, 9.5% and 10.2%, situated well below the means observed, which are 27.9% when the three cases are excluded. In Québec, indirect costs of obtaining venture capital seem therefore very high when a company is not yet at the commercialization stage.

### **3.6 Comments and opinions of executives**

The main comment expressed during the unstructured interviews regards the non-competitive nature of the venture capital market. Companies have few negotiation possibilities and feel as if they are in a situation of total dependence. This situation is aggravated as the length of time required to obtain funding increases, and is reinforced by the apparent collusion among venture capitalists. Executives seem to have significant negotiating power when they possess personal

resources, know the venture capital sector well or are already carrying out sales. Most executives emphasize the very limited interest of venture capitalists in start-ups.

The contributions of venture capitalists beyond financing are considered of minor importance, while experience acquired in earlier rounds and discipline required by the search for external capital are perceived as very positive elements by several executives. Despite significant efforts, governments are apparently unable to create favourable conditions for financing NTBF.

## **CONCLUSION**

Indirect costs of financing technological companies are substantial, in an economy where the supply of venture capital is very abundant. To obtain amounts below C\$500,000 the companies we have studied incur costs that represent, on average, 36% of the amounts raised. The costs are similar for financing rounds between C\$500,000 and C\$1 million. They decrease significantly only for private financing rounds involving amounts greater than C\$1 million, and when companies reach the commercialization stage. Often, tangible and intangible costs incurred to obtain external capital of less than C\$500,000 approach half of this capital, which effectively doubles the cost of business financing. By reducing the financing obtained by 30% to 50%, these indirect costs heavily penalize small companies and diminish their chances of success. This in turn reduces the likelihood of a high return for investors. In particular, the time several teams of executives spend preparing and negotiating a round of financing of a few hundred thousand dollars appears to be an irrational use of time of the key persons within a growing technological firm. Moreover, the indicators of time spent by management show that the negotiation process is very long, which is also problematic in the case of technological firms with small windows of opportunity.

The first implication of this finding in terms of public policy is that it does not suffice to increase the supply of capital to close the equity gap. Even when the supply is abundant, access conditions remain very difficult and especially very long. This finding is consistent with analyses that situate problems of financing NTBF on the demand side more than on the supply side (Mason and Harrison 2002) and with arguments that attribute financing difficulties to various components of information asymmetry.

The costs incurred to obtain funds are heavily influenced by the size of the financing package, regardless of whether the round is an initial round, and the expertise of the people involved. The extent of the executives' knowledge of financing mechanisms has a considerable effect on the cost of obtaining capital, which confirms the assertion by Van Auken (2001) of an information gap related to managers' lack of knowledge of financing mechanisms and conditions. In terms of public policy, actions intended to support and train executives facing this knowledge gap may improve the conditions for obtaining funds more effectively than the inflow of fresh capital would.

The level of satisfaction of Canadian entrepreneurs with venture capital companies is low. In most cases, the institutions involved are government-run or government-aided. Executives interviewed suspected collusion between the stakeholders, and it is possible that very strong government intervention could have intensified industry concentration. The particular situation of Quebec, where governments are directly or indirectly involved in 70% of the venture capital supplied, probably explains this situation.

This study is largely exploratory and is grounded in case studies. Consequently, its results are not generalizable, and it is difficult to infer causal relations. For example, companies that can rely on

resources that are very familiar with technology company financing may reduce their costs. It is also probable that people with sound knowledge of financing will choose to get involved with companies that have fewer risks and better chances of financing. Given that the sample almost exclusively comprises companies that have experienced sustained development, it is possible that our estimates undervalue the indirect costs of financing incurred by the technology firm population as a whole. In the case of weaker companies, venture capitalists' requirements are probably more stringent. This research avenue is therefore worthy of further analysis involving different samples.

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**Table 1: Description of financing rounds and indirect financing costs.** Company number corresponds to the number assigned to each company studied. Companies are described in Appendix 3. PPRIV=1 if the issue is a private placement, PPRIV=0 if the issue an initial public offering. EXP=1 if the executive (or the advisors) have prior experience in venture capital financing; EXP=0 otherwise. The round number corresponds to the order of the round of external financing (1= initial round of financing, 2 and higher = subsequent round of financing). Amount in Canadian dollars (C\$) is the gross proceeds of the issue.

Company number	PPRIV	EXP	Amount in C\$	Negotiation times in months	Round number	Total indirect costs		Cost of preparing the file		Cost of negotiation and conclusion		Other indirect costs	
						in C\$	in %	in C\$	in %	in C\$	in %	in C\$	in %
7	1	0	90,000	6	1	46,040	51.2	27,800	30.9	11,000	12.2	7,240	8.0
5	1	0	150,000	13	1	41,000	27.3	20,000	13.3	12,200	8.1	8,800	5.9
7	1	0	240,000	6	2	40,151	16.7	4,616	1.9	3,000	1.3	32,535	13.6
1	1	0	300,000	13	5	211,439	70.5	95,356	31.8	50,000	16.7	66,083	22.0
6	1	0	428,000	6	2	61,420	14.4	17,000	4.0	21,420	5.0	23,000	5.4
8	1	0	614,000	21	2	294,000	47.9	155,000	25.2	77,000	12.5	62,000	10.1
2	1	0	695,000	14	2	193,084	27.8	27,498	4.0	73,867	10.6	91,719	13.2
12	1	0	1,200,000	22	1	230,000	19.2	145,000	12.1	40,000	3.3	45,000	3.8
9	1	1	1,500,000	12	1	281,500	18.8	160,350	10.7	80,350	5.4	40,800	2.7
6	1	0	1,600,000	18	3 *	289,050	18.1	137,500	8.6	41,000	2.6	110,550	6.9
11	1	0	1,750,000	18	1	391,000	22.3	50,000	2.9	130,000	7.4	211,000	12.1
3	1	1	2,500,000	8	4 **	85,845	3.4	37,600	1.5	20,845	0.8	27,400	1.1
9	1	1	4,000,000	18	2 **	381,900	9.5	118,000	3.0	157,000	3.9	106,900	2.7
11	1	1	4,085,000	18	2	415,800	10.2	85,000	2.1	186,000	4.6	144,800	3.5
10	1	1	5,000,000	12	3	694,072	13.9	51,375	1.0	350,657	7.0	292,040	5.8
1	0	0	1,363,534	10	6	397,522	29.2	0	0.0	172,085	12.6	225,437	16.5
4	0	1	5,000,000	7	3	775,100	15.5	305,300	6.1	253,200	5.1	216,600	4.3
1	0	0	5,600,000	10	7	1,438,095	25.7	0	0.0	1,159,394	20.7	278,701	5.0
Mean			2,006,419	13	2.7	348,168	24.5	79,855	8.8	157,723	7.8	110,589	7.9
Median			1,431,767	13	2.0	285,275	19.0	50,688	4.0	75,434	6.2	78,901	5.9

\* Round not closed when the study was conducted

\*\* Round completed during the commercialization phase

Figure 1: Breakdown of total indirect costs of 18 financing rounds

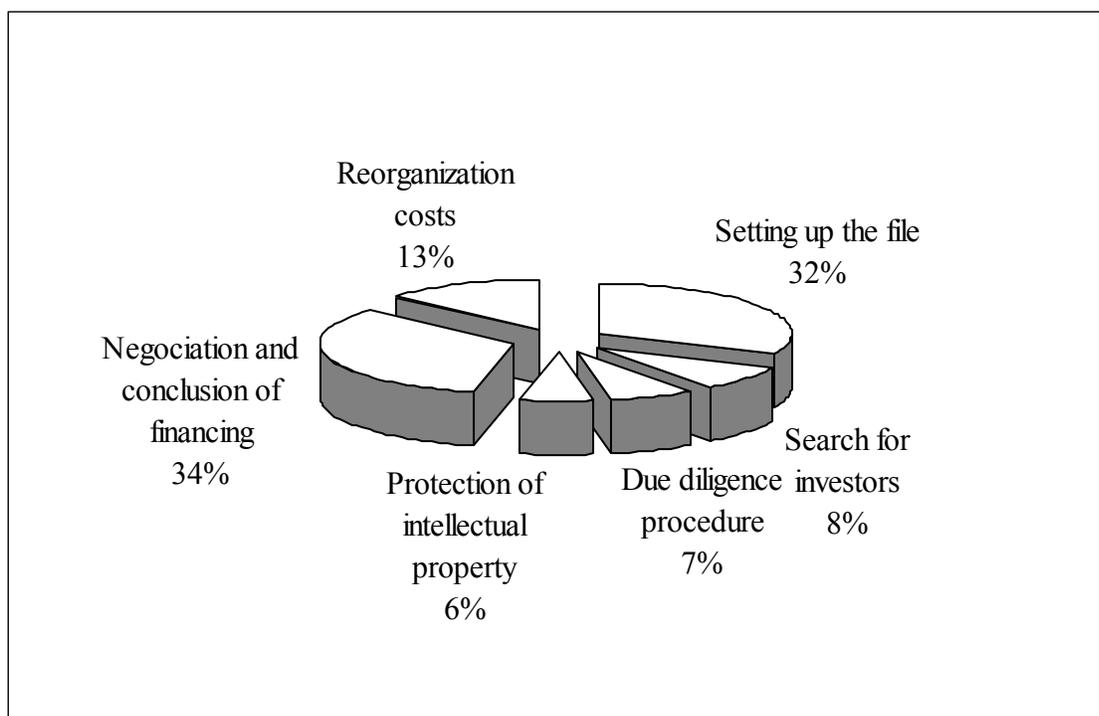


Table 2: Breakdown of indirect costs of 18 financing rounds according to the principal components of the process of obtaining funds and depending on whether the origin is internal or external.

Cost heading	Total		External cost		Internal cost	
	Mean, in C\$	Mean, in %	Mean, in C\$	Mean, in %	Mean, in C\$	Mean, in %
File preparation	79,855	30.81	45,133	16.73	34,723	14.08
Search for investors	33,514	8.26	3,389	0.87	30,125	7.40
Due diligence procedure	16,956	7.01	13,121	5.20	3,835	1.80
Protection of intellectual property	20,585	5.92	14,238	3.88	6,347	2.04
Negotiation and conclusion of financing	157,723	32.61	153,973	31.53	3,750	1.07
Reorganization costs	39,534	12.94	11,220	4.50	28,314	8.42
<b>Total</b>	<b>348,168</b>	<b>100.00</b>	<b>241,074</b>	<b>62.71</b>	<b>107,094</b>	<b>34.80</b>

Table 3: Distribution of indirect costs of financing by size of financing package, for private placements, Mean. %IFC = mean of indirect costs of financing relative to gross proceeds of financing. Median %IFC = median of indirect costs of financing relative to gross proceeds of financing.

Financing amount	<C\$500,000	C\$500,000 to C\$1,000,000	>C\$1,000,000
Number	5	2	8
mean %IFC in %	36.0	37.8	14.4
median %IFC in %	27.3	37.8	16.0

Table 4: Distribution of indirect costs of financing by round of financing for private placements. Initial round = first round of external financing of the company, subsequent round = round that is not the first round of external financing of the company, mean %IFC = mean of indirect costs of financing relative to gross proceeds of financing; median %IFC = median of indirect costs of financing relative to gross proceeds of financing.

Type of round	Initial round	Subsequent round
Number	5	10
mean %IFC	27.8	23.2
median %IFC	22.3	15.5

Table 5: Distribution of indirect costs of financing by manager's experience, for private placements. Yes = manager (or advisor) is experienced in venture capital financing; No = manager (or advisor) is not experienced in venture capital financing. mean %IFC = mean of indirect costs of financing relative to gross proceeds of financing; median %IFC = median of indirect costs of financing relative to gross proceeds of financing.

Experience in venture capital sector	Yes	No
Number	5	10
mean %IFC	11.2	31.5
median %IFC	10.2	24.8

## **APPENDIX 1: SUMMARY DESCRIPTION OF COMPANIES**

### **Company 1**

This company is issued from university research and operates in field of environmental technologies. It is financed by business angels (C\$1.2 million), then by venture capital (C\$300,000) and by private investors through government programme (C\$1.3 million), and IPO (C\$5.6 million).

### **Company 2**

While conducting research, two scientists design an innovative procedure in biotechnology, perform the first tests and conduct a related market study. One year after designing the product, the company was formed with a team of 5 people. The first searches for financing began.

### **Company 3**

For six years, a researcher developed a new useful concept in chemical products. He then sought the means to transform his idea into a business project. The entrepreneur met a manager and founded the company with him. Two other scientists then joined the firm, bringing the team to four (without family ties). The company was then run for 3 years on the savings of its partners and a grant of C\$44,000. It recovered equipment from other organizations. Following this period, the company carried out its first sales and began raising funds.

### **Company 4**

Resulting from technology developed within a large company, the project was financially supported by its promoters for the first 3 years (for C\$1,000,000), until the concept testing was completed. The company, operating in the medical sector, was then created as a spin off. The step

following testing of the concept is obtaining international certification of the company's product. This step justifies the start of the search for financing.

#### **Company 5**

Two scientists founded this company, which specializes in telecommunications. However, this project required major electronic developments and computers. For 1.5 years, the creators worked on its inception. The company was then incorporated and the managers began searching for financing. Their objective was to proceed to the concept testing phase. They produced a business plan and identified their financial requirements: they estimated C\$3,000,000 in financing required for their first stage of development. Initial contacts with VCC were unsuccessful; the sector was poorly perceived and the amounts to commit were too large. After a year of fruitless searches, the company reduced the size of its project and decreased its financing needs from C\$3,000,000 to C\$700,000, to C\$150,000. Despite the time and effort put forth by the managers, this first round of financing was not completed at the time of this study: VCC had issued several additional conditions for their actions and the company was still carrying out the financing search. It began to engage in sales to ensure its continuity. Given these difficulties, the company currently envisions the outright sale of its technology or conclusion of a partnership agreement with a large group.

#### **Company 6**

This company emerged from university research on the chemical properties of a substance, which is the intellectual property of the researcher. This researcher quickly realized that his discovery has multiple applications. He consequently founded a company and began a search for financing that must first enable him to cover the R&D period. The first funds received were C\$305,000 in the form of loans and subsidies from federal organizations. Several fund raising efforts followed.

### **Company 7**

This project was initiated by a company in the field of technological products. In a highly competitive sector, it had to carry out numerous searches for financing to cover its R&D expenses. The first round of financing taught the executives many lessons: in return for supplying C\$90,000, the venture capitalist acquired most of the voting rights of the company and consequently strongly influenced management (hiring, corporate signature, etc.).

### **Company 8**

Two employees of a large national company developed expertise in computers. As they could not apply their discovery within the company, they left their positions and created their own business. The company did not encounter difficulties in its first search for financing; it was even canvassed by a VCC and closed the first round quickly. The second round lasted nearly two years and incurred substantial costs.

### **Company 9**

The entrepreneurs worked for several years to develop innovative technology for very high-speed communications. Encouraged by the results, the promoters decided to launch a business. Because of the technological complexity of the products under development and the inability of the company to generate short-term revenues, considerable capital was required. After drafting its business plan, the financing processes were initiated. The main assets that have aided the company in its fund search are the complementary technological strengths of the entrepreneurs, their personal leadership and the sound commercial approaches with large strategic partners (confirmation of needs with potential buyers). Owing to the considerable capital required and delayed sales, the executives suffered from a sizeable stock dilution during the second round.

### **Company 10**

After six years of university research on development of a software solution for large companies, some professors decided to go into business to commercialize their application. Although the product is relatively advanced technologically, improvements and corrections were required prior to commercialization. Demand for this solution among large companies lengthened the sales cycle (i.e. by necessitating extensive robustness tests and critical analyses of profitability, payback analysis, etc.). Several rounds of financing were then required.

### **Company 11**

The company was founded following the discovery by two university researchers of an innovative chemical procedure. The University owns the property rights and issued the company an exclusive operating licence. The company was initially funded by the shareholders' capital and by the proceeds of the first financing round, which involved two VCs. The second financing round was undertaken to develop the technology and begin commercialisation, and involved three new VCs, including a strategic partner. This partner focused the company's activities on a specialized niche and introduced the company to potential customers. The commercialisation phase was not reached during the period under study.

### **Company 12**

A university professor specializing in logistics and information systems founded a start-up to provide consulting for large companies. A few years later, the repetitive nature of his mandates inspired the entrepreneur to create a software program adapted to these needs, intended for corporate end-users and consulting firms. After deciding to concentrate on developing this product, he obtained initial financing from a government agency, which allowed production of

the first version of the software. He then began to search for venture capital financing. The first round of financing, originating from two venture capital investors, is analyzed in this study.