FINANCING CANADIAN HIGH TECHNOLOGY COMPANIES

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Prepared for Investment Canada

by

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April, 1991

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Executive Summary

Venture capital has matured into an industry in Canada during the past decade. In 1980, there were less than 20 venture investors managing a total pool of capital of about $350 million. By 1990, there were almost 70 venture groups managing approximately $3.3 billion dollars. Although this growth is impressive, it has not yet led to strong links between venture capital and technology-based companies in this country.

A number of trends have become apparent in recent years which influence the availability of capital for Canadian technology companies. Specifically, these trends include:

- a rapid escalation in the amount of capital required to build a successful technology company;
- a significant decline in interest by Canadian venture capital firms in funding technology companies, both in absolute terms and relative to venture capitalists in other countries;
- a lack of involvement by larger Canadian corporations in the funding and development of technology companies despite an upsurge of this type of corporate partnering activity in the United States; and
- an increasing involvement by government-related venture funds in the early stage technology financing market, to the point that these funds are now a key source of capital for young Canadian technology firms.

In short, private sector venture firms are leaving the Canadian technology market at a time when capital requirements are growing, leaving government related venture groups to pick up the slack. The net result is that Canadian technology companies are facing a significant competitive disadvantage relative to their international competitors when it comes to access to capital.

There are a number of structural impediments which limit the ability of the Canadian venture capital industry to achieve the critical mass required to effectively support the growth and development of Canadian technology companies. Some of these impediments include:

- the shortage of experienced emerging technology company managers, particularly experienced marketing and sales managers and managers with previous experience starting and building a technology company;
- the shortage (and continuing decline in real numbers) of experienced Canadian venture capitalists capable of assisting and guiding the development of emerging technology companies;

- the absence of a sufficient number of technology-focussed venture capital funds in Canada to allow for reasonable risk sharing and for the syndications necessary to raise the amounts required to build significant technology companies; and

- the absence of a sufficient number of relevant Canadian or foreign corporate investors with an interest in strategic partnering who will participate in and assist emerging Canadian technology companies.

Governments can play an important role in helping to reduce these impediments, and thereby encourage the venture capital industry to develop stronger links with emerging Canadian technology companies. Some specific proposals which could achieve this goal include the following:

1. encourage reinvestment by Canadian technology entrepreneurs;

2. provide the $500,000 capital gains exemption to employee investors in Canadian technology companies;

3. seed new early stage venture capital pools;

4. encourage corporate venture capital initiatives by foreign and domestic corporations as a part of procurement, takeover and defence policy initiatives;

5. provide financial assistance to Canadian technology companies for recruiting experienced managers;

6. develop and execute a marketing strategy to identify experienced entrepreneurial managers, particularly in the U.S. and to inform them of business opportunities in Canada;

7. establish educational and marketing support for foreign corporate partner solicitation; and

8. establish a database of experienced entrepreneurial Canadian managers working in technology companies in the U.S. or abroad.

These recommendations, if implemented in tandem, will start to address the structural impediments that are limiting the ability of the Canadian venture capital industry to play an important and effective role in helping to create world class technology companies. While the symptom is the flight of capital, the real problem is an inadequate supply of experienced technology company builders and of experienced and knowledgeable technology investors. As that problem is rectified, the capital will, with some encouragement, return to the market on its own accord.

I. Introduction: Building World Class Technology Companies

While commenting on the future of technology venture investing at the recent Venture Forum '90, John Doerr, General Partner of Kleiner Perkins Caufield & Byers (founding investors in Compaq Computer Corp. and Genentech among others) demonstrated the true conviction of the technology business building community in California.

> *I think the fundamental question is: are there going to be opportunities of the multi-billion dollar variety in technology investing in the 1990s? If so, what will they be? I'm here today to suggest that conventional wisdom, as usual, is wrong. There is substantial, even exhaustive evidence that the 1990s are going to be a decade where we are going to have insurmountable opportunity. Lots of multi-billion opportunities for technology investing. Central to this thesis is that the activity we [venture capitalists] are engaged in is not a zero sum game. We can create new opportunity and facilitate the creation of opportunity. One of the best ways to predict the future, if you will allow me to borrow the phrase, is to help finance it. I think it is important to be realistic about all this. None of it is easy; there's lots of competition; follow-on financings are more difficult; the IPO markets are going to remain choppy. It is also the case that I think we have plenty of reason to be optimistic. The science and technology is racing forward, entrepreneurs are more experienced, our networks are more vital and effective than ever and large companies have figured out that they have to work with these technology companies to allow them to be successful. ... I think the challenge is to identify the great companies and the great investments and the formula hasn't changed. We're still looking for the large unmet market need, proprietary technology and outstanding people. That formula is easy. It is reality that is confusing and difficult.*

This is a powerful conviction. This firm is in the business of building multi-billion technology companies, which, for a Canadian, is a staggering idea. How would you even begin to go about getting into the business of building billion dollar technology companies in this country? According to Doerr, optimism is based on ever improving science and technology, experienced entrepreneurs, effective networks and large corporate partners.

An environment in which building world class technology companies is a way of life is one where success and competition appear around every corner. It is an environment in which Nobel prize winning scientists pioneer new research and attract more and more of the world's best and brightest students and scientists; where industry and government compete vigorously for top notch engineering talent, giving them opportunities to develop new applied sciences and technologies, and to create world class products. It is an environment in which high quality, ambitious entrepreneurs have access to highly experienced, world class executives for management team building, and highly experienced world class research and development facilities and personnel for product building. Skilled venture capitalists and eager strategic partners abound to provide value added capital for promising new companies. First class suppliers and truly demanding customers provide the inputs needed to ensure that the new product is of the highest possible quality.

This environment breeds many attempts and several successes in building the new technological enterprises of the future. It is an environment in which failure may

just be one step on the way to success, but where mediocrity is death and in which the players are fanatics. This environment is very different from the one prevailing in Canada today.

The purpose of this report is to analyse recent trends in Canada relating to financing Canadian technology companies, to comment on the factors contributing to these trends, and to put forward some proposals which could help to encourage more activity.

II. Venture Capital: Source of Financing for Canadian Technology Companies?

In a world where product life cycles have shortened dramatically, a firm's capital base has become a key competitive weapon. Technology companies must ask themselves on an on-going basis if they have enough capital to sell their products globally and to maintain their investment in the next generation of product research and development necessary to maintain their initial edge. Unfortunately, most Canadian technology companies are at a competitive disadvantage in this respect, in that they rarely have a strong enough capital base to support both sales and product development in an aggressive fashion.

Entrepreneurs around the world turn to four key sources to provide the capital they need to grow and compete: informal investors, corporate partners, venture capital, and the public equity markets . Informal investors are often an important source of capital at the very earliest stages of a firm's development. Research in Canada and the U.S. has shown that successful entrepreneurs often later become informal investors, financing new firms in the industry to which they owe their success. In California and Massachusetts, for example, which have developed a sizable population of successful information technology companies, informal investors have been a key source of capital for fledgling information technology firms. The same pattern has not developed in Canada. With the possible exception of Ottawa, we have not seen the development of the critical mass in a particular industry in one region which creates a pool of successful entrepreneurs who are likely to invest in younger firms in the same industry. Since the base of successful technology companies in Canada is so small, the absolute number of these informal investors is also small. Corporate partners have also proven they can be crucial to the success of a young technology company in that they can add a great deal of value over and above the capital they invest. Many large corporations in the United States, Europe and Japan now pursue corporate partnerships (strategic alliances) with smaller technology companies as part of their corporate development strategies. Unfortunately, few of the large Canadian corporations are actively partnering with Canada's young technology companies. Finally, the public markets around the world have retreated from new issues of emerging growth and technology companies. This is especially acute in Canada where technology stocks have underperformed the market, shutting off, for the short term at least, another important source of growth capital.

This leaves venture capital as a principal source of equity for Canadian technology companies. But, as previously noted, this source, which has never been strong, is now weakening, as private sector venture capitalists reassess their involvement with Canadian high technology firms.

Venture capital has matured into an industry in Canada during the past decade. In 1980, there were less than 20 venture investors managing a total pool of capital of about $350 million. By 1990, there were almost 70 venture groups managing approximately $3.3 billion dollars. Although this growth is impressive, it has not yet led to strong links between venture capital and technology-based companies in this country.

Any technology based company striving to compete in the international marketplace must be able to make a significant financial commitment to both the research and development required to commercialize the product or service and to the marketing required to gain a strong position in the marketplace. Since most young technology companies do not have adequate internal resources to meet these commitments, access to sources of outside capital is critical if the companies are to achieve their potential. Venture capital should be one of those sources. The link between venture capital and technology companies in the U.S. grew out of the development of innovative technologies needing capital to exploit the perceived market potential and the presence of knowledgeable venture investors who recognized the market potential and were prepared to back the technologies. As the success of these investors in the U.S. became apparent, more capital flowed into the venture industry in Canada, the U.S. and Europe to finance similar types of investments. But Canadian venture capitalists failed to achieve the success with technology investments experienced by their U.S. counterparts.

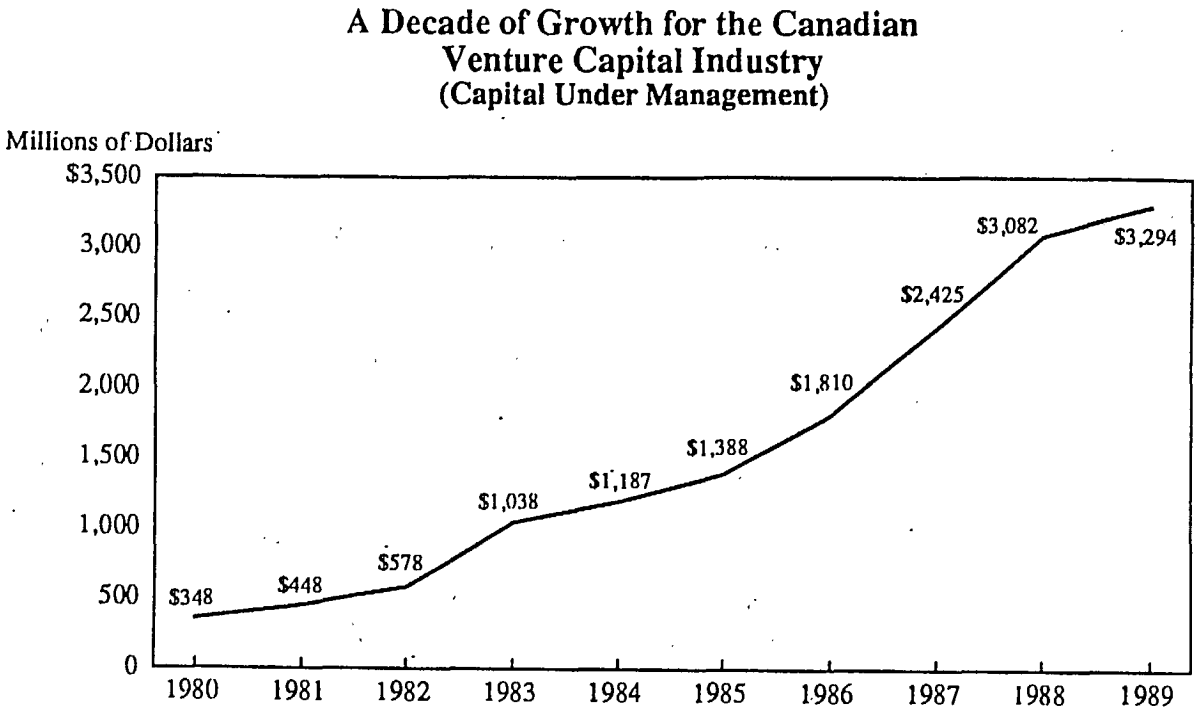
The less successful Canadian experience was influenced by three key factors: (i) the quality of the technology-based investment opportunities available; (ii) the skills of the venture capitalists investing in these companies; and (iii) the amount of capital available for investment. All three of these factors together determine the success of a venture capital investment and its ability to contribute to the creation of a successful world class technology company. Since the availability of capital is perhaps the most tangible of the three factors, it has received the most attention in the public debate. But the quality of entrepreneurial management and the skills of the venture investors are equally important and worthy of attention.

Since there is more data available on access to capital, it is appropriate to begin with a brief discussion of the venture industry, its structure, and its involvement with Canadian technology companies.

A DECADE OF GROWTH FOR VENTURE CAPITAL IN CANADA

The structure of the Canadian venture industry has evolved over the past decade as the pool of capital under management has grown, with considerable impact on the industry's investment patterns. Four different types of venture investors manage the pool of $3.3 billion currently committed to the industry. (At time of

writing, only preliminary data was available for 1990. The data presented in this report, therefore, goes only to 1989, although references are included in the text when preliminary trends are available for 1990.)

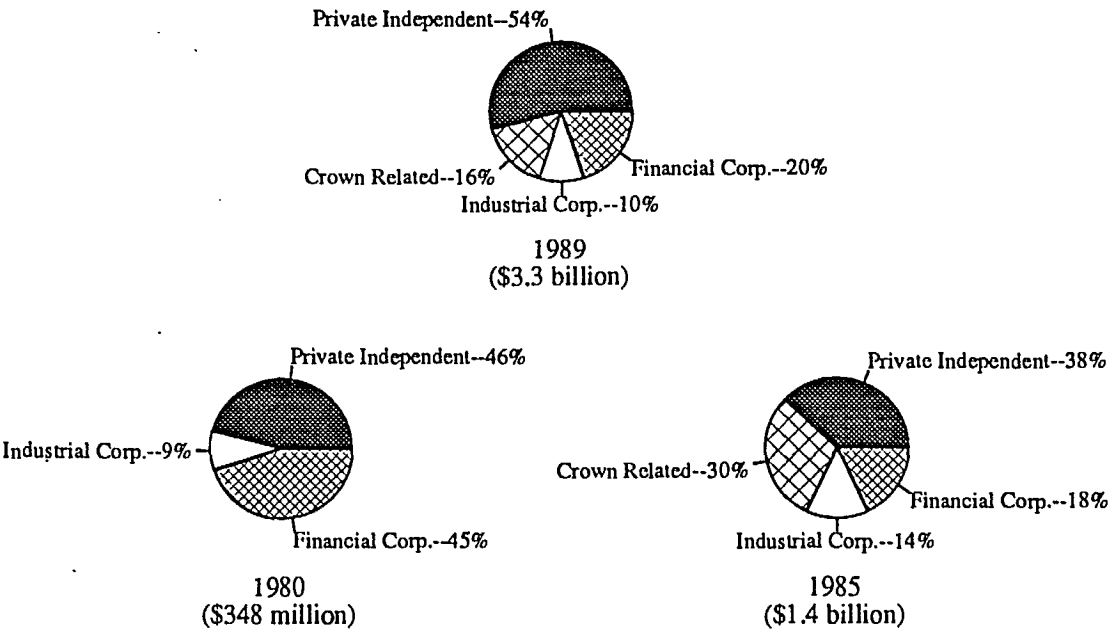


Private independent venture capital funds are the dominant group in the market today, managing about half of the industry's capital. These groups, which generally turn to outside sources like pension funds and insurance companies for their capital, grew quickly in the second half of the 1980s in response to growing interest in venture capital and the need for institutional investors to diversify their rapidly growing portfolios. Since Canadian institutional investors proved generally to be more comfortable with venture capital investments in established (and profitable) companies, a number of funds focussing on expansion, acquisition and buyout financings in mature industries were established with significant pools of capital by groups like Penfund Partners and Canadian Corporate Funding Limited. While some of the older independent venture groups (like Altamira, Ventures West and Helix) continued to invest in early stage technology companies, the new entrants shifted the focus of the private independent funds as a group towards the more mature end of the market and away from high technology.

Large financial institutions, which have participated directly in the Canadian venture capital market since the industry's early days, also tend to operate at the top end of the market. These venture groups (including for example Royal Bank Capital Corporation, TD Capital and Societe d'Investisement Desjardins) now manage

about 20% of the industry's capital, down substantially from the 45% share they managed in 1980. A relatively small group of venture capital funds owned by industrial corporations (like BCE Ventures, Noranda Enterprise and MDS Health Ventures) manage about 10% of the industry's resources and tend to invest across the full spectrum in terms of stage of development.

Changing Industry Structure

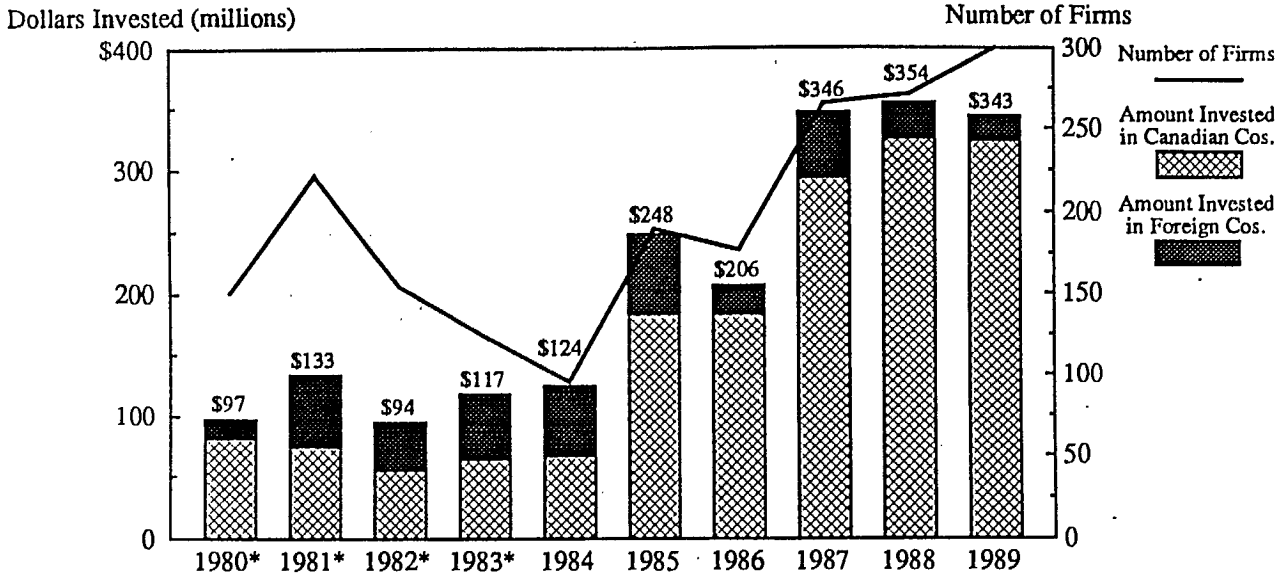


With the growth in the amount of capital being managed by private independent groups and financial institutions has come a shift in investment activity towards expansion financings, acquisition financings and management buyouts and away from early stage investments. Furthermore, a number of these independent groups had early disappointments with technology investments and left that market as well. The net result has been an exodus of private sector investors from the early stage market, and from technology investments in particular.

In response to this exodus, governments have made a strong entry into this segment of the market. These government initiatives have been designed to fill a perceived gap in the regional market for early stage technology financings (eg. Innovation Ontario and AQVIR in Quebec) or to simply augment the regional supply of venture capital (eg. Vencap Equities and Alberta Opportunity Company). Most of these government-related funds have a stated objective of using their capital to

leverage private sector investment, although they have experienced varying degrees of success in this regard. These government-related funds account for 16% of the industry's capital, and, in many cases, they are filling a niche in the market that they believe the private sector has all but abandoned.

A Decade of Growth for Canadian Venture Capital Investment Activity



*Data for Association of Canadian Venture Capital Company members only.

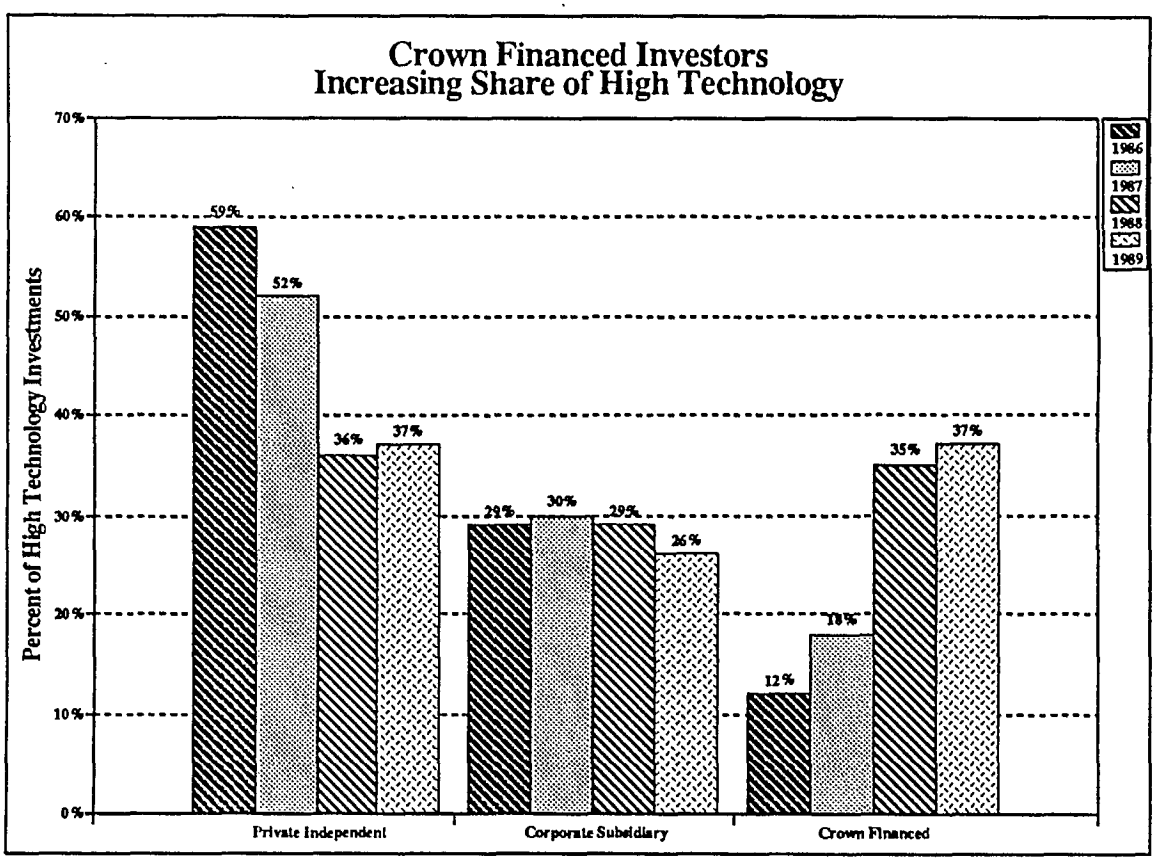
The Canadian venture capital industry as a whole has been investing about $340 million per year for the past several years in an average of about 300 (mostly Canadian) companies, although preliminary data suggests that total disbursements in 1990 were down to about $275 million. The role that crown-related groups are playing in the market is best illustrated by the fact that they account for only about 15% of the total amount invested but more than 30% of the companies financed. It is clear that they are by far the most active investors in the smaller, early stage deals.

VENTURE CAPITAL AND CANADIAN TECHNOLOGY COMPANIES

Although the Canadian venture capital industry has never been heavily oriented towards technology financings (defined as investments in companies in the communications, computer, electronics, biotechnology and medical/health related sectors) as its counterpart in the United States, interest in technology companies is still declining from these already lower levels. In 1986, 43% ($90 million) of the total capital invested by the Canadian venture capital industry went to technology

companies; by 1989, only 23% ($80 million) of the $340 million invested by the Canadian industry went to technology companies. Although the U.S. industry has reduced its emphasis on technology investments, technology-related companies still captured almost 70% (about $2 billion) of total disbursements in 1989. Even on a relative basis, Canadian technology companies are definitely playing in the minor leagues when it comes to the support they get from the venture capital industry.

These trends are even more disturbing when they are further disaggregated to analyse the activity by different types of investors. Private sector (independent and corporate) venture capital companies reduced their technology investments between 1986 and 1989 from $81 million to $53 million, directing only 18% of their total disbursements to technology companies by 1989. In contrast, crown related venture groups increased the total amount invested in technology companies from $9 million in 1986 to $27 million in 1989, which accounted for more than half the total capital invested by these groups in that year.



The growing prominence of crown-related venture groups as a source of capital for Canadian technology companies is evident in most sectors and in most regions of the country. This role is even more pronounced for technology companies still in the early stages of development. Of the $175 million invested in early stage technology companies by Canadian venture capitalists during the 1985-1989 period, crown-related venture groups accounted for 46% compared with the 22% they accounted for of total venture funding to all technology companies during this period.

Half of Canadian VC-Backed Hi-Tech Cos. Have Crown-Related Investors
Crown Share of High Tech.
70%
60%
50%
40%
30%
20%
10%
0%
36%
22%
42%
25%
55%
45%
66%
47%
50%
29%
46%
14%
51%
26%
4%
10%
All High Tech
Canada
British Columbia
Alberta
Manitoba/Sask.
Ontario
Quebec
United States
Share of Companies
Share of $Invested

III. Amount of Capital Invested: Critical for Growth and Success

It is obvious that private sector venture capital groups have been steadily reducing their support for Canadian technology companies and government related funds have been stepping in, in an effort to pick up some of the slack. This is clearly not a tenable situation over the longer term, since government cannot sustain itself fiscally or politically as the primary source of equity capital for young Canadian technology companies, nor should it attempt to do so. It is only by addressing the issues that limit private sector involvement in the early stage technology market that the venture capital industry will be able to become an effective component of the infrastructure supporting the development of Canadian technology companies.

Most governments have initiated their programs in the belief that their presence in the market will in fact alleviate the problem. However, the increasing role of crown-related venture groups has, in our view, depressed the amount of capital young technology companies, which in turn can significantly limit their ability to compete internationally. Many of the crown-related groups have restrictions on the amount they can invest, which explains, in part, why the average financing for early stage technology firms in 1989 was less than $500,000.

High Technology Investing
By Stage & Industry
1989

	Early Stages		All Stages	
INDUSTRY	Total Amount ($ millions)	Amt./Firm ($ Thousands)	Total Amount ($ millions)	Amt./Firm ($ thousands)
Communications	3	272	13	684
Computer HW	5	555	13	866
Computer SW	7	636	18	750
Other Elect.	8	800	17	739
Biotechnology	4	571	8	1000
Med./Hth.Rel.	4	286	10	500
All High Tech.	30	484	80	734

The aggregate industry commitment to technology companies clearly influences the amount of capital an individual technology company can access, particularly given the limited access it has to other sources of capital. Are those Canadian technology companies which have succeeded in attracting venture capital investors getting adequate infusions of equity to allow the company and the investment to succeed? Probably not.

The average venture financing of a Canadian technology company in 1989 was $657,000, only 65% of that of its French counterparts, 52% of its UK-based competitors, and only 30% of its American based challengers. Coupled with the lack of capital available from other sources, this is a crippling handicap for emerging Canadian technology firms.

TECHNOLOGY COMPANY FINANCING FROM VENTURE CAPITAL			
	# of Investors/ Financing	Average Technology Investment ($000's)	Average Technology Financing ($000's)
1989			
United States	3.08	699	2157
United Kingdom	1.37	919	1263
France	1.58	634	1005
Canada	1.10	599	657
1985			
Canada	1.33	661	886
% Change 1985-1989	(17%)	(9%)	(25%)

It is particularly disturbing to note that the amount of capital available to Canadian technology companies relative to their international competitors has in fact been deteriorating during the past five years. Even if inflation is ignored, the average technology financing in Canada has been eroded by more than 25% since 1985. A fundamental part of the problem is that there are not enough venture capital firms making technology investments in Canada. As a consequence, syndicates of investors cannot be formed and Canadian venture investors are faced with having to finance technology companies alone.

Why does this situation exist? In part, because few Canadian venture capitalists have the skills and experience necessary to really add value to a technology investment to help it succeed, and in part, because many Canadian technology firms lack the management depth and experience to compete in the international market, which makes them a higher risk investment and less attractive to Canadian venture groups. This situation also exists because the Canadian venture investors participating in the technology market simply do not have the resources to invest in young technology companies on a par with their counterparts in the U.S. or Europe.

At first blush, Canadian technology companies do not seem to be faring all that badly, at least in relative terms. Canada ranked fourth among North American and European countries in terms of the size of the venture industry's capital base at the end of 1989, and it ranked sixth in terms of capital invested, number of investments made, amount invested in technology companies, and number of technology investments made. Ahead of Canada were the United States, United Kingdom, France, West Germany and The Netherlands (Italy was number four in total dollars invested while The Netherlands was seventh). Canada ranked eighth in terms of share of total disbursements going to technology firms. (The small Austrian venture capital industry was the leader in this respect, investing 94% of total disbursements in technology companies.) Standing in sixth and eighth positions in

overall venture capital industry comparisons, Canadian technology companies do not seem to be all that badly off.

When the average size of technology investment is considered, Canada falls to 13th place, which, although a cause for concern, is not, in itself, a crippling situation. However, it becomes crippling because there are so few technology investors with whom syndications can be arranged. The result is that the average financing (the total amount invested) is generally not much bigger than the average investment (the amount invested by one venture investor), leaving the Canadian company with small infusions of capital and less venture capital support while its foreign competitors are accessing significantly larger amounts from several venture sources.

Canadian venture capitalists are not active deal syndicators, primarily because the number of groups with similar investment interests is small and regionally focussed. There are a handful of Canadian companies who have been financed at a "world class" scale. In these cases the venture capital fund either provided all the capital (eg. Helix Investments for Geac Computer Corp. and Altamira for Biomira), put together a Canadian syndicate (Ventures West, Alberta Opportunity Company and Vencap Equities for Myrias Research and Grayrock Shared Ventures, Crown Life and the FBDB for Telesystems SLW) or put together an international syndicate (Ventures West and the FBDB for Ballard Power Systems). But, there are a very few investments of this magnitude, (one per year, on average, in the whole country) and, as a result there is undue focus on the success or failure of the individual firms. If the company fails (as Myrias Research recently did), all technology investments are tarred with a negative image. Since Canadian venture capitalists have not, as yet, turned one of these high profile deals into a home run winner, they have not been able to counter these perceptions. The net result is Canadian technology companies are securing less, not more, capital to finance their growth.

The funding problem is evident at both the macro and micro levels. Substantially more capital is being invested in key technology sectors in the U.S., the U.K., France, the Netherlands and Germany by the venture capital community, making it difficult for Canada to achieve leadership in any of these sectors internationally. Augmenting the problem is the fact that the Canadian technology companies that do attract funding are not able to secure anywhere close to the amount of capital as their U.S. competitors. Canadian early stage technology enterprises received, on average, $490,000 in venture capital funding in 1989, just 21% of the funding their U.S. counterparts received. This gap exists across all industry sectors, ranging from 41% for early stage computer software companies to just 9% for communications companies.

There are two reasons for this dramatic gap in early stage technology company funding. Only about 10 Canadian venture groups are interested in early stage technology companies and several of these are public sector groups which are generally restricted to investing in their own province. Consequently, there is very little room for syndication. Furthermore, some of the more active public sector groups like AQVIR and Innovation Ontario are limited in the amount they can invest in a company, regardless of the company's capital requirements.

HIGH TECHNOLOGY INVESTMENT
BY INDUSTRY
1989

COUNTRY	Communications (Mil.s)	Rank	Computer Related (Mil.s)	Rank	Other Elec. (Mil.s)	Rank	Biotechnology (Mil.s)	Rank	Medical/Health (Mil.s)	Rank
United States	$569	1	$810	1	$310	1	$291	1	$544	1
United Kingdom	$84	2	$216	2	$92	2	$80	3	$67	2
France	$26	4	$131	4	$58	3	$41	4	$58	3
Canada	$13	7	$31	6	$17	4	$8	6	$10	7
Netherlands	$14	6	$32	5	$12	6	$14	5	$11	6
Italy	0	15	$14	8	$10	7	$5	8	$9	8
West Germany	$59	3	$153	3	0	12	$82	2	0	13
Belgium	$16	5	$16	7	$15	5	$1	10	$3	9
Spain	$1	9	$6	9	$4	8	0	11	$15	5
Sweden	0	15	0	13	$1	11	$6	7	$17	4

(For dollar rankings, conversions made at current rates)

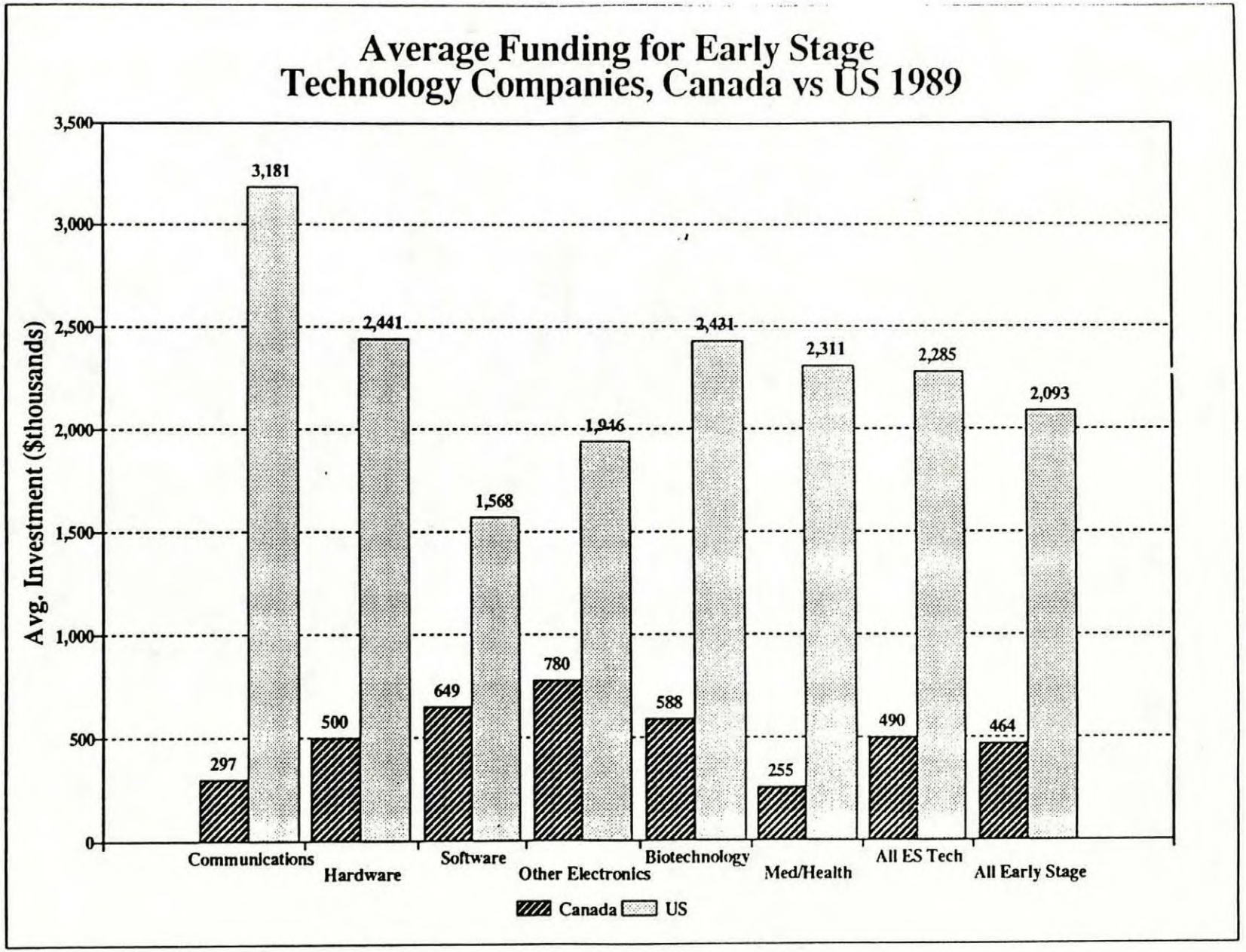
This funding gap continues in the public markets. A comparison of the 50 fastest growing small public companies in the United States and Canada revealed that the U.S. companies surveyed raised, on average, more than three times more capital in their initial public offerings than their Canadian counterparts, widening the funding gap that began at the venture capital stage. The impact of this gap is best evidenced by a comparison of growth rates experienced by the Canadian and American firms in the survey. The average annual growth in sales for the Canadian firms during the 1984-88 period was 84%, while the annual growth rate for the U.S. companies was 204% . The U.S. companies collectively increased their sales by 91 times during this period while the Canadian companies increased their sales by 8 times. Given these growth rates, a Canadian company equal in size to its American counterpart in 1984 would have been only one-twelfth the size of the American firm 5 years later, and therefore most likely at a significant competitive disadvantage in the international market. The Catch 22 of funding being denied until success is proven and success being unattainable without adequate funding continues to plague Canadian high technology companies.

IV. Factors Contributing to Lack of Capital for Technology Firms

The issues underlying the trends in technology financing for Canadian technology companies are complex and diverse. Some of these issues are discussed below.

1. Canadian Early Stage Management Teams Are Less Experienced

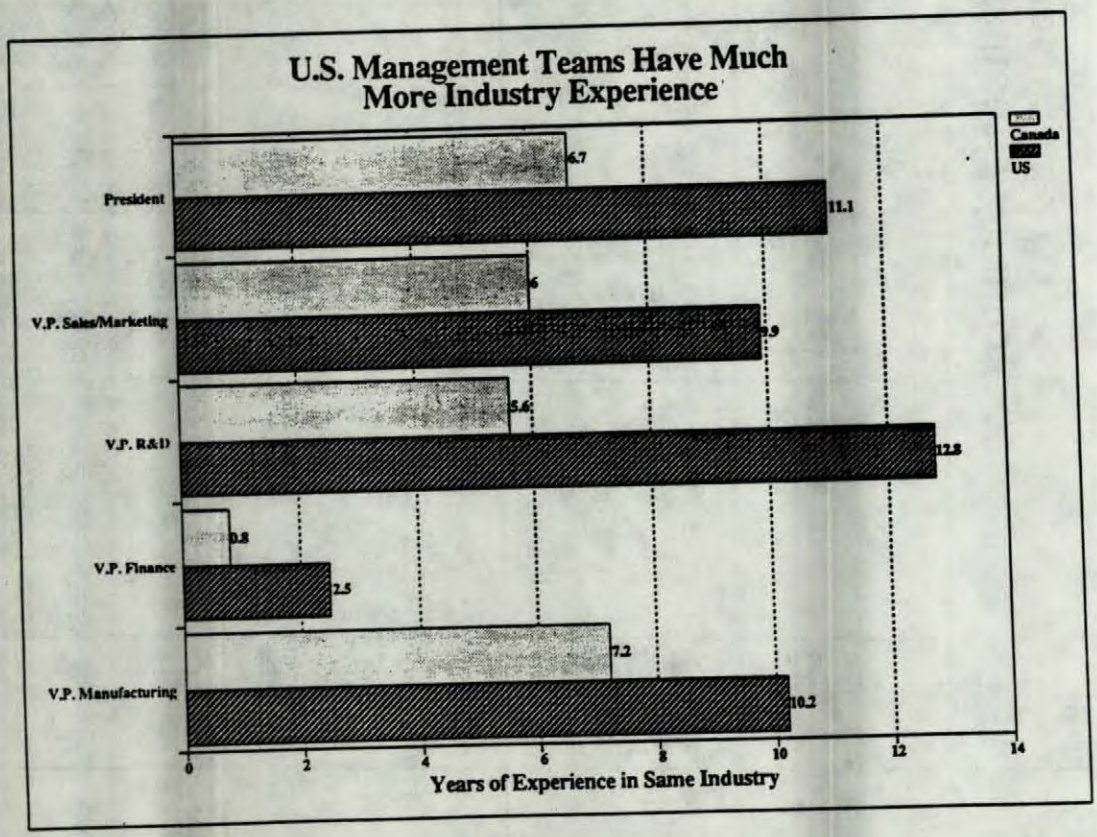
To build a successful technology business, the company and its backers must be able to find capable and experienced managers who can lead the company up the growth curve. It should come as no surprise that, since there are fewer technology companies and fewer growth company success stories in Canada than in the U.S.,


Average Funding for Early Stage
Technology Companies, Canada vs US 1989
Avg. Investment ($thousands)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
297
3,181
500
2,441
649
1,568
780
1,946
588
2,431
255
2,311
490
2,285
464
2,093
Communications
Hardware
Software
Other Electronics
Biotechnology
Med/Health
All ES Tech
All Early Stage
Canada
US

the pool of experienced management talent available to emerging Canadian technology companies is dramatically smaller. This constraint was evidenced by a comparative analysis of venture backed early stage companies in Canada and the United States. The research included 42 Canadian early stage firms and 38 American early stage firms. (Only 19 of the Canadian companies were in technology sectors, compared with 32 of the American firms, which is a telling statement in and of itself.)

The average American executive in these firms had many years more experience in their specific industry than their Canadian counterpart, giving them not only a stronger understanding of their business, but a more developed network and reputation, which are key assets when raising capital. The U.S. management team was also more likely to include individuals with prior experience in a start up. More than 60% of the presidents of the American early stage companies in the survey had previously been involved with a start up, compared with only 40% of the presidents of the Canadian firms. This prior experience is extremely valuable when dealing with the many unique problems that arise in trying to build a company from scratch.

Given that the Canadian management teams were less experienced, it is not surprising that their venture capital backers were more likely to discount the new company's projections than their American counterparts. Canadian venture capitalists in the survey discounted the new company's sales projections for the following year by 48% and their profit projections by 75% compared with the discount of 8% and 17% applied by the American venture capitalists. These projections and their discounting have a substantial impact on the valuation placed on the company, and hence on the amount of capital they can attract without suffering substantial dilution. The issue of capital, therefore, is closely interconnected with the issue of management.



2. Successful Entrepreneurs Help Create the Next Generation of Successful Entrepreneurs

Successful entrepreneurs often are the founders of new companies and they have become an important source of venture capital. In the United States, William Poduska has co-founded three major computer corporations: Prime Computer, Apollo Computer and Stellar Computer. Ross Perot has now launched Perot Systems after building and selling Electronic Data Systems to General Motors and providing millions of start up capital for Next Computers. The founder of Next, Steven Jobs, was co-founder of Apple Computer. Others, like Mitch Kapor of Lotus Corporation, have created their own venture capital companies, and many others have provided funds for venture capital fund managers and joined large venture capital companies like TA Associates as General Partners.

This recycling of successful entrepreneurs and their wealth into the formation of new companies has also happened in Canada. Terry Matthews and Michael Cowpland, founders of Mitel Corp., have used their substantial business building experience and wealth to found Newbridge Networks and Corel Systems. Roy L Merchant Group and Societe Tremplin 2000 are venture capital funds that manage capital provided by several successful entrepreneurs. Ron Begg, entrepreneur creator of the Milk-Mate product line, is now the President and Chief Executive Officer of Working Ventures, the national labour sponsored venture capital fund.

Successful entrepreneurs also frequently invest in young companies. In a 1989 survey of Canadian informal investors, Venture Economics found that 52% were business owners and 75% had previously founded a company. This study also showed that 30% of the company founders that made informal investments chose companies in their own industry. Those company founders whose business was in a technology sector all invested in technology companies, and two thirds of them invested in the same industry as the company they had founded. This data demonstrates how success feeds on itself in technology business building.

Canadian Informal Investors
1989 Survey

52%	**were business owners**
75%	**had founded businesses**
30%	**who founded businesses invested in the same industry**
100%	**who had founded technology businesses financed technology businesses**
66%	**who had founded technology businesses financed businesses in the same industry**

However, in absolute terms, Canada still has a relatively small number of successful entrepreneurial firms that have been built into a company of substance within a relatively short period of time, which limits the rate at which success can compound itself.

3. Canadian Public High Technology Companies - Images of Futility

For investors and entrepreneurs alike, the decision to participate in building a technology enterprise in Canada requires confidence and inspiration. One need only look at the performance of public high technology companies to understand why that confidence is lacking.

For the financial press and investors, the most visible companies are those that are publicly traded. One would assume that public companies are also typically the biggest and best of their industry. But if this is the case, the performance of Canadian public technology stocks does not auger well for the future of young

Long Term Performance of
TSE Listed High Technology Companies

SELECTED HIGH TECH STOCKS	1983 HIGH	CLOSE Nov. 1990	% PRICE CHANGE
CAE Industries	2.81	5.00	77%
Comterm Inc.	13.625	0.33	-97%
Canadian Marconi Co.	28.25	9.50	-66%
Computer Innovations Distr.	11.375	3.40 (1)	-70%
Develcon Electronics	26.25	0.50	-98%
G&B Automated Equipment	16.00	---- (4)	-100%
Gandalf Technologies Inc.	22.00	2.70	-87%
Geac Computer Corporation	27.50	1.05	-96%
Glenayre Electronics Ltd.	14.375	3.90	-72%
Lanpar Technologies Inc.	7.625	---- (4)	-100%
Linear Technology Inc.	11.875	5.00	-57%
Leigh Instruments Ltd.	6.625	6.75 (2)	1%
Lumonics Inc.	17.50	7.75 (3)	-55%
Mitel Corporation	38.00	1.43	-96%
Nabu Network (MFG)	11.375	---- (4)	-100%
Northern Telecom	30.31	30.00	-1%
Siltronics Inc.	4.20	---- (4)	-100%
Spar Aerospace	27.88	10.50	-62%
SHL Systemhouse Ltd.	19.75	4.75	-75%
Orcatech	9.25	---- (4)	-100%
BASKET VALUE CHANGE	346.575	92.56	-73%
AVERAGE CHANGE			-67%
TSE High Technology Index	1258.77	721.96	-42%
TSE 300	2361.08	3151.01	33%
TSE 35 - Total Return Index	155.87	243.84	56%

(1) Acquired by Systemhouse @$3.40 in 1987
(2) Acquired by Plessy @$6.75 in 1987
(3) Acquired by Sumitomo @$7.75 in 1989
(4) Shares delisted.

Canadian technology companies. From its peak value in 1983, the TSE High Technology Index declined by 43% to November 1990. An individual basket of the stocks listed (one of each) would have declined in value by 73% over this period. Of the twenty stocks on the list, only two showed increases (one was Leigh Instruments which was acquired in 1987 and went bankrupt in 1990), five were delisted and are defunct, and two more are now trading at less than a dollar a share. Even Canada's technology success story, Northern Telecom, had not seen an increase in its market price over the seven year period. The unfortunate reality is that the bigger and more mainstream the company, the higher the return, with the blue chip Toronto 35 Index yielding a total return of 56% over the period.

Even if the three indexes are equalized at the height of the bull market in the summer of 1987, the performance gap is quickly reestablished.

The poor stock performance of Canadian technology companies is having three crucial implications. First, the players associated with the high technology business building process are becoming demoralized. Second, institutional investors who supply funding for venture capital companies are becoming cynical about the ability of technology focused venture funds to succeed. And third, the valuations and amount of money a young Canadian technology company can hope to raise by going public in Canada, based on the market's confidence in their future prospects, is becoming very limited.

4. Institutional Investors - Wary of Venture Capital Commitments

In a 1989 survey of leading Canadian institutional investors, Venture Economics discovered that the level of interest in new venture capital funds was low. The primary criticism of the responding pension funds and insurance companies was that past investments had not met their returns expectations, and that the industry and the environment had not changed enough to suggest that performance would be significantly higher in the future.

The 37 survey respondents which have total assets of $120 billion, had already invested $705 million in venture capital funds, 78% of which was in Canadian funds. These groups had also invested more than $270 million directly in the equity of private Canadian companies, indicating further that the respondents were clearly major financial institutions with substantial experience in venture capital and private company funding.

The survey results suggest there is little interest in the institutional community in financing venture capital funds with a technology focus. On a scale of one to four, (one is no interest and four is high interest), the average response for the 25 firms that expressed an interest in future venture capital activities was 1.9 when questioned about their interest in technology funds. Only 5 of the institutions said they would seriously consider investing in a technology fund. These 5 investors, whose assets averaged $6.6 billion and who had an existing average stake in venture capital of more than $27 million, projected they would collectively commit only $14 million in 1990 to venture capital funds, only half of which was expected to go to new funds.

Canadian Institutional Investors Interest in High Technology Focused Venture Capital Funds

Interest in Technology Focused Venture Funds	Number	Total Assets	Invested in VC Funds	Amount Total VC	Next Year to New VC
High or Seriously Consider	5	$33 billion	$136 million	$14 million	54%
Some Interest	11	$31 billion	$253 million	$44 million	49%
No Interest in High Technology	9	$31 billion	$266 million	$21 million	47%
No Current Interest in Venture Capital	12	$26 billion	$50 million	---	---
TOTAL	37	$120 billion	$705 million	$79 million	49%

Institutional investors interested in technology were also more willing to invest in U.S. based venture funds, suggesting that Canadian venture capitalists raising funds that will be invested, at least in part, in Canadian technology companies, are competing with their American counterparts for funds.

Canada's technology entrepreneurs also face the reputation of their forebearers in accessing capital. Past failures have contributed to the current scarcity of capital. Given a free market, funding will flow to investment opportunities that warrant it. The question becomes: is there reason for investors to be optimistic, or as John Doerr phrased it *"are there going to be opportunities of the multi-billion dollar variety in technology investing in the 1990s?"*

V. Addressing the Problems: Some Proposals

It is clear that a number of important trends are emerging which are highly relevant to any examination of the availability of capital for Canadian technology companies. Specifically, over the past few years, we have seen:

- a rapid escalation in the amount of capital required to build a successful technology company;
- a significant decline in interest by Canadian venture capital firms in funding technology companies, both in absolute terms and relative to venture capitalists in other countries;
- a lack of involvement by larger Canadian corporations in the funding and development of technology companies despite an upsurge of this type of corporate partnering activity in the United States; and

- an increasing involvement by government-related venture funds in the early stage technology financing market, to the point that these funds are now a key source of capital for young Canadian technology firms.

In short, private sector venture firms are leaving the Canadian technology market at a time when capital requirements are growing, leaving government related venture groups to pick up the slack. When the reasons for the exodus of private sector capital are examined, a complex set of inter-related factors begins to emerge.

On the surface, the reason for this exodus looks simple -- the investors have experienced very disappointing rates of return on the Canadian technology investments made in the 1980s. When returns are poor, capital leaves the market. But the reasons for the poor returns are more complex. There are, in our view, a number of structural factors at play which limit the ability of Canadian technology companies to achieve world class stature and limit the ability of the Canadian venture capital industry to achieve the critical mass required to effectively support the growth and development of Canadian technology companies.

These structural impediments include:

- the shortage of experienced emerging technology company managers, particularly experienced marketing and sales managers and managers with previous experience starting and building a technology company;

- the shortage (and continuing decline in real numbers) of experienced Canadian venture capitalists capable of assisting and guiding the development of emerging technology companies;

- the absence of a sufficient number of technology-focussed venture capital funds in Canada to allow for reasonable risk sharing and for the syndications necessary to raise the amounts required to build significant technology companies; and

- the absence of a sufficient number of relevant Canadian or foreign corporate investors with an interest in strategic partnering who will participate in and assist emerging Canadian technology companies.

It is all too easy to focus on the lack of capital as the root problem. Governments at both the federal and provincial levels have responded to the lack of private sector capital by committing public sector capital to "fill the gap". But the lack of capital is only a symptom -- and by not attempting to understand and address the cause of this symptom, the real problems have been allowed to grow and the environment for creating successful technology companies to further deteriorate. It is only by addressing these problems, the structural impediments to success, that capital will flow back into the market to finance Canadian technology companies and support them in their efforts to become world class competitors.

Existing private independent Canadian venture funds, including the newer entrants such as Canadian Venture Founders and Capitecq, collectively have enough capital to maintain the current low levels of private sector technology company funding for perhaps two years. Therefore, if government venture groups maintain their

historical support, (which might not be possible, given the current fiscal realities), annual technology-related investments of approximately $80 million (comparable to recent years) are sustainable over this time frame. This $80 million level is grossly inadequate in terms of the capital required to build highly successful technology companies, yet even this modest commitment can be expected to decline rapidly in the next several years in the absence of some radical changes in the underlying dynamics of the investments.

Many of the more promising Canadian firms, when unable to find venture capital in Canada or elsewhere, will sell out to larger, better-funded corporations, usually foreign owned. This pattern is already particularly evident in the Canadian software industry where a number of $2 to $5 million revenue firms have recently been acquired by large U.S. software companies. The effect of these acquisitions will be to substantially reduce the base of technology companies from which highly successful Canadian "threshold" firms might grow. While some of the proceeds from the sale of these companies might be reinvested, on an informal basis, in other Canadian technology companies, the process of recycling capital and entrepreneurs is a slow one, and it will not allow Canada to keep pace and develop threshold technology companies.

This cycle cannot be broken by additional direct government intervention in the Canadian venture capital and technology sectors. Direct intervention in the form of increased capital commitments (which is not a practical option in today's environment in any event), will do little to address the structural impediments that have led to poor rates of return and the flight of capital. Government can, however, play a role in helping to reduce those impediments and thereby allow both the venture capital industry and the technology sectors to move closer to achieving critical mass and a mutually supportive environment.

REMEDIAL ACTION: SOME PROPOSALS

Historically, too much of the discussion regarding the technology venture capital funding problem has dealt only with the shortage of capital, often deteriorating into either sharp criticism of the risk taking appetites of the Canadian venture capital community or the business building ability of the Canadian technology entrepreneurs. The thrust of these discussions must change and be re-focussed on the reasons for the flight of capital, which means focussing on the people component of the issue as well as the capital. Both sides, together with governments, should agree that the existence of the funding gap provides strong evidence of a failure to develop an economically viable marketplace through natural market forces.

To create a strong venture capital industry capable of playing an active role in the creation of world class technology companies, an explicit effort must be made to retain the resources that we have that are so critical to the process --- the experienced entrepreneurial managers, the venture capital managers, and the capital that, in the past at least, has been made available for investment in Canadian technology companies.

These three resources are highly inter-related and each plays a critical role in the building process. Without good technology business builders, technology focussed venture capitalists will not exist; without good venture capitalists, capital will not flow to technology-related ventures; and the lack of adequate amounts of venture

capital to finance new technology companies will inevitably result in these companies being sold prematurely and talented Canadians deciding to move outside of the country in order to pursue their technology interests.

PROPOSAL #1: ENCOURAGE RE-INVESTMENT BY CANADIAN TECHNOLOGY ENTREPRENEURS

Informal private investors can make a valuable contribution to the pool of experienced entrepreneurial managers by providing capital and business support to fledgling technology firms and continuing to provide counsel as the business matures. Given that research has shown that the majority of informal investors are experienced business builders and company founders, these investors can also help offset Canada's shortage of experienced venture capital technology investors.

The investment vehicle of choice for many of these investors has been through one of the provincial venture capital programs, which offer a tax credit or matching loan to provincial venture capital companies (VCC's) which invest in eligible firms. Since many of these programs were launched with the intent of encouraging the establishment of local or regional venture capital companies, complex safeguards were built in to ensure that the money was invested quickly, in the right types of companies and using certain equity structures. A number of these VCC's were established by intermediaries who added an additional management cost to the investment and who took a fee for establishing the VCC.

The federal and provincial governments should be encouraged to re-consider these programs and to

> *replace them with a simplified program that would enable informal investors to make direct equity investments in eligible technology businesses and obtain an immediate 30% cash grant in return. The investor would be required to hold his investment in the company for a minimum of four years. The maximum cash grant and the minimum investment level could be adjusted over time to control program costs and ensure that only serious investments are made.*

PROPOSAL #2: PROVIDE THE $500,000 CAPITAL GAINS EXEMPTION TO EMPLOYEE INVESTORS IN CANADIAN TECHNOLOGY COMPANIES.

This major exemption from federal income tax is currently limited to purchasers of shares in private Canadian controlled small businesses only so long as a sale occurs while the company is still private. This significantly limits the companies which qualify and constrains growth by discouraging a company from going public. The restricted application of this exemption is particularly counterproductive when employees are owners because they have an incentive to sell before the company realizes its growth potential, which is generally long after it goes public. As currently structured, the exemption is more useful to outside investors than to key employees.

> *The proposed capital gains tax exemption should be available only to genuine full-time employees who:*
>
> *o buy shares of companies when they are private; and*

- *o sell the shares only after having owned them for at least five years, during three of which they were full-time employees.*

At any one time, an individual can own the shares of only one company which qualifies for the exemption, and it will not matter whether the company is publicly traded or private at the time of the sale. The aggregate personal lifetime exemption would be $500,000.

PROPOSAL #3: SEED NEW VENTURE CAPITAL POOLS.

To retain Canadian capital for technology investing, it is critical that an experienced management pool is in place in both the technology companies and the venture capital funds. At the same time, specific measures are required to stop the flight of capital from the technology sector that has been taking place in recent years, and to convince private sector sources of capital that investing in Canadian technology firms can indeed generate an acceptable return on investment.

While governments in Canada have been making a laudable effort to fill the technology venture funding gap created by the exodus of private capital sources, this strategy can be dangerous, since without an adequate supply of co-investors many of these firms will need substantial on-going capital support from government if they are to grow. If this support is not forthcoming, (which it is unlikely to be, given prevailing fiscal conditions), it is quite likely that many of these companies would fail. Government venture groups are also often unable to provide the necessary non-financial support and direction that many of these technology companies badly need and that their competitors in the United States are receiving from their venture capital backers.

Rather than attempting to intervene directly (which in our view would be neither practical nor effective), at least a portion of existing government funding for venture investments and economic development initiatives should be redirected to address the structural impediments constraining the growth of Canadian technology companies.

Canada definitely needs more venture capital funds ... not just more venture capital, but more funds. Syndicating investments among a number of funds is a time proven method of spreading risks and applying more support to individual technology firms. Syndicating also allows venture investors to learn more quickly from one another and to gain from each other's network of additional capital sources.

Previous research conducted by Venture Economics on the fastest growing Canadian and U.S. companies showed that the average venture capital backed U.S. growth company in the sample received $17 million in venture capital from 11 venture investors over 3 rounds of investment prior to going public. In Canada, the average venture capital firm received 1 round of venture capital totalling $3 million from 1 venture investor. For the Canadian venture capital investor, the inability to syndicate results in much higher risk levels per deal and constrains the scope of the investment opportunity in absolute terms. For Canadian technology entrepreneurs, more funds mean a more competitive market and more chances to convince investors to participate in their companies.

More venture capital funds and more technology focussed venture capital would help to retain the Canadian expertise that has developed, and to increase the prob-

ability of combining expertise and capital to create successful technology companies.

> *The provincial and federal governments should therefore consider redirecting some of the funds now being used for direct venture capital investing and economic development initiatives to seed several new technology focussed venture capital funds.*

Such an initiative could be launched by calling for proposals from venture capitalists to manage technology focussed venture capital funds. The funds selected would be allocated $5-10 million or up to 25% of their target fund size, subject to raising the remaining amount from private sector sources within 6 months. By offering its capital on an advantaged basis, government could directly impact the rates of return achieved by the private sector investors, thereby setting the stage for more private capital to return to the market.

These advantages need not be costly for the government. For example, the government's capital could be made available on a first in-last out basis. The up-front commitment from government will help engender confidence in other prospective investors. By not taking its capital back until all private sector investors have done so, the government would be reducing the holding period for the private investors between drawdown and return of capital by one or more years, and thereby increasing the rate of return.

PROPOSAL #4: ENCOURAGE CORPORATE VENTURE CAPITAL PROGRAM INITIATIVES BY FOREIGN AND DOMESTIC CORPORATIONS AS PART OF PROCUREMENT, TAKEOVER AND DEFENSE PROJECT COMMITMENTS.

Procurement policies have often been used as a tool to support smaller companies. Increasingly these procurements have included research and development commitment requirements or Canadian and provincial content purchasing requirements. The results of such policies have been varied and allegations of political favouritism, higher costs to taxpayers and quality/delivery concerns are frequently heard.

However, by allowing a venture capital program commitment to qualify as a "benefit" or as Canadian content, not only could some of the above mentioned problems be minimized but the stock of venture capital could be increased.

Defense, transportation and communication procurement contracts in particular could provide an effective means of not only providing additional venture capital but also of generating more strategic partners. Many of the large corporations involved in these programs are exactly the sorts of companies that are actively forming strategic alliances around the world.

Foreign corporations seeking to takeover strategically important Canadian companies might also be encouraged to include venture capital initiatives as part of their purchase agreements. Such a strategy was recently incorporated as a condition of British Gas' takeover of Consumers Gas.

PROPOSAL #5: PROVIDE FINANCIAL ASSISTANCE TO CANADIAN TECHNOLOGY COMPANIES FOR RECRUITING EXPERIENCED MANAGERS

The lack of experienced technology company builders in Canada is a fundamental part of the problem. Top quality entrepreneurial managers are in heavy demand worldwide, are difficult to locate and are expensive to acquire. For emerging Canadian technology companies, the recruitment of such individuals is often out of the question. However, the impact that even one experienced business builder can make on an emerging company can be enormous. Since venture capitalists invest primarily in management, the right management team can often spell the difference between obtaining venture capital or going without.

Emerging technology companies face three major problems when recruiting experienced management talent: the high cost of the search itself, which in many cases, will require considering individuals working outside of Canada; persuading good candidates to leave their known environment and to join a promising but (likely) undercapitalized company in a small (and perhaps distant) market. (This problem can sometimes be overcome with a very generous compensation package and guarantees, but more often it becomes an absolute barrier.) The third problem arises when the other two are overcome. When a good candidate is identified and an acceptable compensation package can be negotiated, the compensation arrangement required to secure a good candidate is often well beyond the norm for the existing management team, which upsets the balance internally.

To address these problems, the government should provide financial assistance to Canadian technology companies for recruting experienced managers. This assistance could perhaps be in the form of an income subsidy of up to $50,000 per person per year for 3 years (paid directly to the new recruit); and a one-time subsidy to the company to assist in recovering recruitment expenses.

Such an initiative could be implemented at the federal level (applying to recruitment from outside Canada) or at the provincial level (to attract managers from Central Canada to firms in Atlantic Canada, for example).

PROPOSAL #6: DEVELOP AND EXECUTE A MARKETING STRATEGY TO IDENTIFY EXPERIENCED ENTREPRENEURIAL MANAGERS, PARTICULARLY IN THE U.S., AND TO INFORM THEM OF THE BUSINESS OPPORTUNITIES IN CANADA.

To support the recruitment measures proposed above and enhance the potential for Canadian technology companies to recruit management talent from the U.S. or abroad, government can play an important role in terms of information and awareness classified above. To this end, marketing materials should be developed to explain the technology business and research environment in Canada to foreign executives, and to describe who the players are, what Canada has to offer, and how they can learn more. Launching such a marketing campaign in co-operation with industry associations or selected technology sectors would enhance its effectiveness (and could be integrated with efforts to draw Canadians back to Canada, as discussed below).

PROPOSAL #7: ESTABLISH EDUCATIONAL AND MARKETING SUPPORT FOR FOREIGN CORPORATE PARTNER SOLICITATION.

Smaller Canadian technology firms are clearly lagging their international competitors in establishing strategic alliances with larger corporate partners. Given the important role that a strong strategic partnership can play in the growth of an emerging company, it is appropriate for governments to provide marketing and educational support in an effort to reverse this trend.

To this end,

- *a comprehensive educational and marketing strategy should be developed on an annual basis which provides for assistance to Canadian technology companies in selected technology sectors that want to establish a strategic alliance with a domestic or foreign partner which addresses the need to identify and gain access to corporations that could be candidates for such alliances.*

Investment Canada has recently launched several initiatives to help Canadian companies in selected technology sectors to identify strategic partners in the United States and Europe. Profiles of selected Canadian companies have been developed and circulated to interested foreign corporations with the assistance of the Canadian Embassies abroad. This is just one of many ways in which Canadian companies can be presented to a wider audience using the "door-opening" power of the federal and/or provincial governments. Greater effort should be made to use the skills of the Canadian Trade Commissioners and Science and Technology Officers in an integrated fashion in our Embassies abroad to identify potential partners, determine their interest, and arrange introductions. It is particularly important that federal and provincial officials co-operate in this area, not only to reduce duplication but, more importantly, to increase effectiveness.

Canadian trade associations also have an important role to play in educating Canadian companies about the partnering process and in helping to identify and attract potential strategic partners. Organizations like the Canadian Advanced Technology Association (CATA), the Information Technology Association of Canada (ITAC), the Canadian Association of Data and Professional Service Organization (CADAPSO), the Electrical and Electronic Manufacturers Association of Canada (EEMAC), Medical Devices Canada (MEDEC), the Association of Canadian Venture Capital Companies (ACVCC) and the Industrial Biotechnology Association of Canada can each play a role by using their credibility and their contacts to orchestrate the interaction of emerging Canadian technology firms with larger prospective partners. Special conferences, focussed trade shows, partnering fairs, surveys, directories, published case studies, training sessions, visitation programs, and survey tours are some of the initiatives that could be incorporated in a strategy to accelerate the development of a strategic partnering infrastructure in Canada. The strategy to establish that infrastructure must also be designed to build much stronger links between venture capital companies, technology companies, research institutes and trade associations in Canada and their counterparts abroad.

PROPOSAL #8: IN COOPERATION WITH UNIVERSITIES AND TECHNOLOGY-RELATED INDUSTRY GROUPS, ESTABLISH A DATABASE OF EXPERIENCED ENTREPRENEURIAL CANADIAN MANAGERS WORKING IN TECHNOLOGY COMPANIES IN THE U.S. OR ABROAD.

The United States has always acted as something of a magnet for many of Canada's brightest and best. It is not at all uncommon for Canadian business graduates to aspire to Harvard or Stanford for their MBA, nor is it uncommon for a newly graduated Canadian biochemist or engineer to aspire to working in Silicon Valley. While hard data is not available, we all know of such people who have gone to the States for education or work experience and chosen to stay there.

Unlike many of their Canadian counterparts, these people have gained management experience in technology companies with strong research and development capabilities, and new product introduction/marketing departments. They have also built a broad set of relationships during their careers with individuals in other technology companies, which have proven to be very valuable. The skills acquired by and networks built by such individuals have been key factors behind the rapid growth and success of Silicon Valley, and the use of these skills and contacts in the Canadian entrepreneurial community is also bound to be highly beneficial. The federal government should therefore take the initiative to bring together parties that would stand to benefit from establishing a database of Canadian managers with experience building technology companies who are living and working in the U.S. or abroad. Since universities typically do a very good job of staying in touch with their graduates, they should play a central role in this initiative. The University of Waterloo, for example, would clearly benefit if critical mass were achieved in the information technologies sector. Similarly McGill University would benefit in all likelihood from more activity in the biotechnology sector.

By the same token, technology related industry associations have a great deal to gain from the growth and development of their particular sector and all associations are under considerable pressure to increase the services provided to their membership. Access to a database of skilled Canadians with management experience in emerging technology companies in the U.S. could be a very valuable service indeed.

Introductions could be made, as required between selected trade associations (e.g. ITAC, CADAPSO, Biotech, etc.) and leading Canadian universities, with a view to establishing a database of experienced non-resident Canadians for each technology sector. The same approach could perhaps be adopted with leading U.S. colleges known to attract Canadians (although the benefit to the college is less clear in this case). Trade associations could also draw on their networks to identify Canadians abroad in their field. The government could provide administrative support to this initiative in secretariat style, as it now does with a broad array of advisory panels and boards.

Once these databases are in place, they can be tapped to simply "get the word out" to Canadians about opportunities back home (as per recommendation 6) or for specific recruitment efforts (as per recommendation 5). These managers should be made aware of what is happening in Canada in their field of technology, including such initiatives as the Federal Networks of Centres of Excellence, and they should be encouraged to renew contacts and to participate in the development of the Canadian technology sector. Some of these talented and experienced individuals

might be encouraged to return and while others might at least become candidates for strategic corporate partnerships.

These recommendations, if implemented in tandem, will start to address the structural impediments that are limiting the ability of the Canadian venture capital industry to play an important and effective role in helping to create world class technology companies. While the symptom is the flight of capital, the real problem is an inadequate supply of experienced technology company builders and of experienced and knowledgeable technology investors. As that problem is rectified, the capital will, with some encouragement, return to the market on its own accord.