Technological Innovation Studies Program

Research Report

CANADIAN ENTREPRENEURSHIP
A STUDY OF SMALL NEWLY ESTABLISHED FIRMS

by

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Department of Economics,
Carleton University
October, 1971

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The views and opinions expressed in this report are those of the authors and are not necessarily endorsed by the Department of Industry, Trade and Commerce.

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PART I

INTRODUCTION

SCOPE AND OBJECTIVES

The scope of this study is to provide empirical data about the factors which advance and obstruct Canadian entrepreneurship, with a view to determining the form that Canadian government assistance might take. The population examined in this study consists of small, newly established ventures initiated by technologically-oriented entrepreneurs. Thus, our observations with respect to innovation and entrepreneurship in Canada relate mainly to this grouping of firms. Some additional observations will be made with respect to foreign owned subsidiaries.

ENTREPRENEURSHIP AND INNOVATION

A classical description of entrepreneurship is that provided by Professor Cole as,

> "...the purposeful activity (including an integrated sequence of decisions) of an individual or group of associated individuals, undertaken to initiate, maintain, or aggrandize a profit oriented business unit for the production or distribution of economic goods and services."[1]

Professor Cole describes the process of entrepreneurship as including innovation, management and adjustment to external conditions, which is directed at six areas of business activity:

> "1) The determination of the business objectives of the enterprise, and the change of those objectives as conditions require or make advantageous;
>
> 2) The development and maintenance of an organization, including efficient relations with subordinates and all employees;
>
> 3) The securing of adequate financial resources, the retention of them, and the nurture of good relations with existing and potential investors;
>
> 4) The acquisition of efficient technological equipment, and the revision of it as new machinery appears;
>
> 5) The development of a market for products, and the devising of new products to meet or anticipate consumer demands; and
>
> 6) The maintenance of good relations with public authorities and with society at large."[2]

It should be noted that Cole's description of entrepreneurship reflects successful entrepreneurship, and the failings of entrepreneurs fit into the six listed areas of business activity. It will be shown later that failure to perform adequately in one of the listed areas is frequently sufficient cause for over-all failure.

Almost all of the cases examined in our study involved technological innovation, and, thus, we are dealing primarily with technological entrepreneurship which has been described as follows:

> "The firm is started by two founders, both of whom are in the middle thirties. One usually can be described as the driving force. He conceives the idea and enlists the other founder. They come from the same established organization, which is where they got to know each other. Either both are in engineering development or one is in engineering and the other is a product manager or in marketing. Often, they have achieved significant prior success, with titles such as Section Head, or Director of Engineering, being common."[3]

In more than half of the firms examined, this pattern of technological entrepreneurship, which resulted in the formation of new ventures, prevailed.

For the purposes of this study, the process of innovation is viewed as including invention, the conception of an idea, and its commercialization.[4] There exists three types of innovation:[5]

1) Fundamental - these innovations create totally new products and processes which may give rise to the formation of a new industry (e.g. aircraft).

2) Functional - for these innovations the product or process remains essentially the same, but the method of performing the function is new (e.g. power brakes).

3) Adaptive - these innovations centre largely on modifying existing products or processes (e.g. minor alterations to design and size).

None of the cases examined involve fundamental innovation.

OUTLINE OF STUDY

The remaining part of the study is organized into four sections. Part II contains a summary of our findings and policy considerations. In Part III we identify the sources of information and the methods of data collection. Part IV provides an analysis of our findings and in Part V areas for further research are suggested.

PART II

FINDINGS AND RECOMMENDATIONS

FINDINGS

1. Sixty-four per cent of the entrepreneurs possessed post-secondary training and most had on-the-job experience before establishing their first venture. Eighty per cent of the entrepreneurs possessed a technical background.

2. Psychological as well as economic factors motivate entrepreneurs. Negative factors, such as insecurity and dissatisfaction with their existing work environment, may be as important as positive motivating factors.

3. The newly-established ventures were usually in those lines in which the entrepreneurs had previous experience.

4. Fifty per cent of the entrepreneurs were immigrants to Canada and tended to be more impressed by the environment for entrepreneurship in Canada than native-born entrepreneurs.

5. The majority of the entrepreneurs lacked general management expertise, and were ill-prepared to manage a newly-established venture. There is no reason to believe that the man with the technical expertise is the best man to organize the commercialization of the technology.

6. Fifteen per cent of the firms were evaluated as being successful and 35% appeared to have some chance of becoming successful.

7. Failure of firms did not necessarily result in their physical disappearance.

8. Entrepreneurs are very reluctant to delegate control and share ownership. This is probably the single most important reason for the poor performance of many firms.

9. One out of eight firms was managed by part-time management personnel.

10. There appear to be two entrepreneurial regions in Canada; Ontario and British Columbia.

11. First attempts at stating company objectives, surveying market possibilities and assessing the commercial feasibility of the product or process often occurs when the entrepreneur applies for financial assistance from government or business.

12. Many of the cases involved the formation of more than one company in order to commercialize the innovation. One company was the research and development unit which was also used to control another company which was the producing unit.

13. Token equity participation by employees was used to offset the lower salaries paid by the entrepreneurs.

14. Thirty per cent of the entrepreneurs were simultaneously promoting a number of projects through a variety of companies.

15. Success breeds success, but failure did not necessarily discourage the entrepreneurs from starting up new ventures.

16. The need for capital funds was the most compelling problem facing the entrepreneur, 35% of whom started their operations on limited personal cash and savings.

17. Sixty-four per cent of the entrepreneurs expressed reservations about approaching venture capital groups for fear of losing control over their operations. Access to government funds was favoured because control would not be lost.

18. All interviewees were recipients of government financial assistance for research and development. Approximately one-third of the firms could not have completed their projects without P.A.I.T. assistance.

19. Many of the entrepreneurs had difficulty in distinguishing between their business and personal finances.

20. Debt financing was favoured over equity financing because of control factors. Canadian banks were criticised for being overly conservative. U.S. sources of venture capital were felt to be more readily available than Canadian sources.

21. Sixty per cent of the innovations were of the "adaptive" type and 40% were of the "functional" type.

22. Research and development was largely of the developmental nature, conducted in-house. Sixty-six per cent admitted to using some outside services.

23. Thirty-three per cent of the firms subcontracted their manufacturing activity.

24. The research and development and manufacturing operations of the newly-established ventures often approximated a machine-shop setting.

25. Only 20% of the firms had a satisfactory marketing organization.

26. Eighty-five per cent of the firms introduced their innovations into a highly or moderately competitive market.

27. The entrepreneurs had little sophistication in the use of patent protection.

28. Eighty-one per cent of the firms included exports in their market projections. The limited size of the Canadian market was a critical consideration for these firms.

29. Technological entrepreneurs tend to be product-oriented rather than customer-oriented.

30. There is a strong similarity between the problems experienced by newly-established innovative firms and small business in general.

31. P.A.I.T. recipients commented favourably about the advice and assistance received from government. Many expressed a desire to receive management assistance as well.

32. The firms commented on the desirability of government purchasing products from firms which received government assistance.

33. Knowledge about government assistance programmes and the availability of Canadian venture capital was poor.

34. There was no clear understanding among the entrepreneurs of the industrial sectors which the government was interested in financing.

35. The organization of government is such that it is very difficult for it to act in the role of a private venture capitalist.

36. Thirty per cent of the firms would have carried out their projects without government assistance.

37. The scope for innovation in foreign subsidiaries is limited.

RECOMMENDATIONS

Consideration should be given to developing policies in the following areas:

1. Designing special management programmes for Canadian entrepreneurs, particularly those involved in the start-up of new enterprises.

2. Promoting greater ties between Canadian entrepreneurs and Canadian venture capital and management consulting firms. One method of achieving this might be to contract out to private firms the evaluation of applicants for government incentive programmes which is presently done in-house.

3. Getting the Department of Manpower and Immigration to select and encourage the immigration of persons with entrepreneurial skills.

4. Promoting greater awareness about entrepreneurship on the part of universities, particularly in the Faculties of Engineering and Administration.

5. Developing a more effective public information programme about the availability of government incentive programmes for entrepreneurs. Since the banks play a key institutional role, programmes might be publicised through the banking system.

6. Devising means of exploiting the scarce entrepreneurial skills during the lifetime of the entrepreneur.

The successful implementation of these policies can only be realised after an industrial strategy for the country has been determined. Government programmes should attempt to be consistent with the goals of this strategy. Such a strategy would enable the different departments to decide on the type of innovation and entrepreneurship which should receive support, and the way the support should best be implemented. In addition, other economic policies, such as tariff policy and foreign investment policy should be made consistent with this strategy.

SUGGESTED TOPICS FOR FURTHER RESEARCH

1. Development of a conceptual framework for analysing entrepreneurship in Canada.

2. A longitudinal study of the nature of Canadian entrepreneurship involving a selected group of firms.

3. An analysis of the determinants of entrepreneurial poles in Canada.

4. Development of a bank of in-depth studies of Canadian entrepreneurship for instructional purposes, both for university students and for practising entrepreneurs.

5. An analysis of the impact of corporate takeovers on Canadian entrepreneurship.

6. An analysis of the impact of government programmes on entrepreneurship in Canada, with special reference to government-business relations.

7. A comparison of Canadian entrepreneurial performance with that of other countries.

8. A comparative study of private and public support for innovation entrepreneurship and small business in Canada, U.S. and selected European countries.

PART III

SOURCES OF INFORMATION

AND

DATA COLLECTION METHODS

METHODOLOGY

The study involved an examination of forty-seven firms. The selection of these firms resulted from information gained from recognized Canadian entrepreneurs, interested business executives, trade association representatives, government officials and published sources. The sample selected was based on judgement and the availability of information. Every effort was made to ensure that the interviewees were technological entrepreneurs involved in the formation of new firms. With few exceptions, the firms were small. An attempt was made to obtain regional representation for the sample. However, it should be noted that no interviews were conducted in the Atlantic provinces.[6]

Information on these firms was obtained through telephone and personal interviews. Prior to the interviews, the authors collected materials on the companies from secondary sources in order to acquaint themselves with as many facets of the companies as possible. The secondary sources included newspapers, trade magazines and periodicals, Canadian Parliamentary Debates, Government press releases, Royal Commission Reports, Senate Committee Hearings, and special reports from financial lending institutions.

SOME STATISTICS

The following data provides some pertinent information about the sample which will be further commented on in Part IV.

LOCATION OF NEWLY ESTABLISHED FIRMS

Number of Observations = 47

Quebec	17%
Ontario	40%
Prairies	26%
B.C.	17%
	100%

INNOVATIONS BY TYPE

Number of Observations = 47

Fundamental	0%
Functional	30%
Adaptive	70%

MARKET TARGETS BY TYPE

Number of Observations = 47

Primarily domestic	19%
Primarily export	10%
Domestic and export	53%
Export and domestic	18%
	100%

EDUCATIONAL BACKGROUND OF ENTREPRENEURS

Number of Observations = 96

Postgraduate Training	14%
First degree and equivalent technical certification	50%
High School or less	36%
	100%

PART IV

ANALYSIS OF FINDINGS

THE ENTREPRENEUR

Less than 10% of the entrepreneurs interviewed gave money as the single outstanding reason for going into business. The classical stereotype of the small business capitalistic entrepreneur as a person who consciously sets out to maximize his profits by exploiting a product concept was almost totally absent in our sample. This observation can be explained in terms of the following reasons:

1. There was a lack of systematic search behaviour exhibited by the entrepreneurs when they assessed and compared alternative market opportunities. Inadequate analysis was undertaken of the cost and sales relationships as well as the degree of competition that would be encountered in the market place. Selecting the most profitable choice was rarely a conscious decision made by the entrepreneur.

2. The entrepreneur seldom made his decision to establish a business by making a comparison of his paid employment income with that expected from owning and managing his own company.

The reasons for becoming self-employed entrepreneurs were usually far more complex, and included the following two critical considerations:

1. The desire to produce something through one's own efforts and to achieve both personal satisfaction and public

recognition. This drive can be triggered off either through positive or negative experiences. For example, a positive factor might be a father's background as a successful self-made businessman. A negative factor might result from frustration experienced through employment in a company which is not willing to recognize the prospective entrepreneur's contributions or proposed project idea for commercialization.[7] Spin-offs, from business particularly, and government and academia were quite evident in our sample study. Approximately twenty-six per cent of the firms established resulted from spin-offs.

2. The desire to be one's own boss was common to all the entrepreneurs, regardless of the other reasons which prompted them to establish their business venture. An important point to note is that in the case of at least 20% of the entrepreneurs interviewed, fear, insecurity and inadequacy in their previous jobs were critical reasons offered, for "going on one's own". These attitudes included fear of losing one's job, the need to supplement present income, ensuring activity during retirement, and creating a better future for one's children.

The educational background of the entrepreneurs revealed that about 64% (of the 96 entrepreneurs) possessed post-secondary training. The remainder had high school or less. It was found that if the entrepreneur graduated from high

school he would tend to continue in formal education. It was noted that the first ventures established by the entrepreneurs were generally in those lines of business in which they had gained their on-the-job experience, and in areas in which they tended to possess their greatest degree of formal training.

Approximately 50% of the entrepreneurs studied were immigrants to Canada mainly from the U.K. and Europe. The majority of these entrepreneurs possessed university training, and some on-the-job experience in Canada before embarking on their own venture. They tended to be more committed to their venture, more enthusiastic and less critical of the Canadian environment than the native born entrepreneur. The latter tended to view the U.S. scene as being more favourable to the entrepreneur than the Canadian setting, while the former would compare the Canadian environment to the more restrictive situation abroad, usually in his native country. The foreign born entrepreneur noted the ease with which one could establish a business in Canada, the greater availability of capital in Canada than at home, and the greater social mobility which was reflected in the individual being judged in Canada on his performance, rather than his background.

Ontario accounted for 40% of the 47 newly established firms that were contacted by the authors. The prairies accounted for 26%; Quebec 17%; and British Columbia 17%.

While our sample was derived on the basis of judgement, it is the strong impression of the authors that Ontario and British Columbia are the two major areas of entrepreneural activity in Canada.

MANAGERIAL CAPABILITIES

About 80% of the entrepreneurs who established new ventures possessed a technical background which usually included formal education and on-the-job experience. Moreover, they had a common trait with respect to their preoccupation with "gadgetry", technical problem solving which may lead to innovation. It was therefore not surprising that the technical capabilities of many of these newly established firms was of a satisfactory calibre, at least at the outset. Yet, based on our field interviews, only 15% of these ventures were commercially successful, another 30% appeared to have some chance of becoming successful, with the remaining 55% either failing or failed. It should be noted that the failure of a firm need not result in its physical disappearance, but merely in a change of ownership, or the pursuit of a new project. In addition, the closing of business firms is not always indicative of unsuccessful operation. It may be connected with events in the personal lives of the owners, particularly in the case of small operations where the fate of the business is linked closely with the lives of individual owners and their families.

The major reason for failure can be attributed to the obvious lack of general management expertise on the part of these firms. While the entrepreneur's technical capabilities (e.g. design capabilities) may have enabled him to promote the formation of a company, it was seldom a sufficient condition

to ensure the profitable performance of a newly established venture.

Only a few of the technical entrepreneurs possessed general management expertise comparable to their technical skills. This fact may be attributed to the following reason: lack of a formal business education coupled with work experience which tended to be in the technical area. In those instances where other management job responsibilities were included, they were rarely of a senior decision-making type. In brief, most of the entrepreneurs were ill-prepared to organize and manage a newly established venture. Their level of competence in such management areas as marketing, finance, personnel and even manufacturing was sadly lacking.

This general management capability problem was further compounded because the entrepreneurs tended to resist giving up any control over their corporate operations and preferred to operate in the role of owner-managers. Instead of moving in the direction of multiple entrepreneurship by forming a professional management group to oversee the operations of the firms, the entrepreneurs tended to do everything and be everything to everybody. In a number of cases where control was given up, the timing was too late to introduce the necessary corrective action to salvage the venture. Reticence to share management control, and the downgrading of the non-technical management areas of expertise also resulted in the hiring of

personnel whose financial and marketing expertise left a lot to be desired. The non-technical employee and/or partner was no match for the entrepreneur either in sophistication or drive. On the other hand, entrepreneurs who did hire competent personnel in the non-technical areas, often did so on a part-time basis, payment for which might have included a modest salary and stock option. Accountants, lawyers and management consultants were the professional types usually included in such an arrangement. However, the participation of part-time experts in the initial stages of new venture operation in a competitive market can be equally unsatisfactory. Senior management of one out of every eight firms was largely of a part-time nature.

This concern over control and the initial downgrading of the non-technical areas of management by the entrepreneurs often effected a metamorphisis on his part by turning him into an "amateur" General Manager, which in turn undermined the potential profit base of the newly established venture. For example, technological entrepreneurs on forming a small company may find themselves so pre-occupied with raising capital, generating marketing opportunities, training personnel and performing other administrative duties, that they are unable to devote the required effort to managing the technical commercialization of the innovation. Unwillingness to delegate control even in the technical area, or an inability to impart

the technical know-how to one's subordinates often leads to unnecessary complications and delays which have the effect of undermining the total operations. Further, the very drive and enthusiasm which led to the formation of the enterprise, namely the entrepreneurs technical innovative skills, becomes partially lost when he expands his activities into areas in which he has limited competence.

Lack of general management sophistication, especially in such areas as finance and marketing, have killed the potential success of many operationally sound projects. Inability to identify and tap existing sources of venture capital, and poor selection of distributive arrangements are but two of the reasons which can be traced to the foregoing shortcoming. When the entrepreneur experiences this state of affairs, usually because of his own management myophia, he becomes frustrated and despondent. These are the pre-conditions which often lead to the abandonment of the entrepreneurial project.

Illustrative of this general lack of management expertise, is the absence of any attempt on the part of most of these entrepreneurs to establish a set of clear cut objectives for their firm. Consequently, planning procedures, operational guidelines and contingency plans are rarely evident in the management of these companies. First attempts at stating company objectives, surveying market possibilities,

and assessing fully the commercial feasibility of the product or process often occurs when the entrepreneur applies for financial assistance either from government or business.

Regardless of the managerial sophistication of the entrepreneurs, many of them, who were involved in starting up small firms, incorporated two companies. One company was assigned the responsibility of doing the research and development work, and holding the patents where applicable. This company was usually the exclusive domain of the technological entrepreneur(s). Outsiders would rarely be allowed to obtain equity participation in this firm. The second firm, which was controlled by the first, would be assigned the manufacturing and marketing task of the innovation. This firm usually served as the vehicle through which the entrepreneurs would try to raise debt and equity financing. Moreover, it was in this company that the entrepreneur would allow for employee equity participation. In this manner, a spirit of personal participation was engendered on the part of key employees, and served as a way of compensating them for their lower salaries. Effective control of this firm was still retained by the entrepreneur through the financial and research and development linkages between the two companies. In addition, there were tax considerations for having two separately incorporated companies.

A further point to note is that approximately 30% of the entrepreneurs were simultaneously involved in promoting

a number of projects through a variety of small companies. Failure in one company seldom dissuades this entrepreneur from promoting other ventures.

FINANCIAL MANAGEMENT

The need for capital funds was one of the most challenging problems facing the entrepreneur. Thirty-five per cent of the entrepreneurs interviewed stated that their companys' capital structure, at the time of incorporation, consisted largely of their own cash and savings. In some instances, the capital was barely sufficient to cover the expenses of incorporation. Some of these entrepreneurs were former employees of firms who had gone into business and were hopeful that either their last employers or employers' customers would place orders with them and thus enable them to promote their own businesses.

In addition to the entrepreneurs' savings, other sources of initial capital investment included family, friends, financial institutions, suppliers, former employers and prospective customers. Most of the entrepreneurs had little appreciation of the minimum investment that was required for the effective operation of a new business.

The relationship of cash, stock and credit in running a business was only vaguely understood. These entrepreneurs had invested their total savings at the outset, and as problems arose during the commercialization of their project, many of them were in the unenviable position of not having reserves to draw on to tide them over their difficulties. Many of them had difficulty in distinguishing between their business

and personal finances. It appeared that the capitalization process of the newly established ventures was largely based on limited savings and great expectations.

While the most obvious source of capital is the venture capital firm, 65% of the entrepreneurs interviewed expressed reservations about approaching such groups. The following reasons were offered:

1. Venture capital firms tend to want to assume equity control of the firm in which it invests.

2. Venture capital firms insist on appointing their own company executives on the Board of Directors of the firm, and may go so far as to wrest complete control from the entrepreneur by having their own man assume the responsibility of chief executive officer.

3. Venture capital firms who have acquired effective control of the entrepreneur's company tend to prevent the entrepreneur from raising additional capital through equity participation for fear of weakening their control.

The pre-occupation with the issue of control appears to be the critical factor underlying the resistance of entrepreneurs against utilizing the services of venture capital groups. Even in those instances where entrepreneurs admitted that these groups were in a position to extend both capital and much needed management assistance, they, nonetheless, preferred to struggle on their own, knowing fully well that the

chances of success might be slim. The reasoning for such an attitude may be understood in the context of the following statement made by an entrepreneur: "I started my own business because I wanted to be independent, and in control of my own career. Now that I am in a position to make a dollar, why should I have to share it with some unscrupulous stranger."

Generally speaking, entrepreneurs prefer to obtain their capital requirements from lending institutions. However, few of the newly established ventures were able to obtain long term financing because the companys' fixed assets were minimal and their reputation was at best unknown. It should be noted that in those cases where the entrepreneur was a recipient of a government loan/grant he was often able to use it as a lever to obtain a further loan from a local bank.

Everyone of the 47 firms studied was a recipient of some governmental assistance programme for research and development. We estimate that 40% of the firms would not have been able to continue their project development programme without government assistance. This was especially so with reference to P.A.I.T. which was singled out for praise by P.A.I.T. recipients. Another 30% of the firms could have commercialized their projects without government assistance. Firms in this group tended to be larger, and were often foreign-owned. The attitude of this group of firms was "if the money is available from the government, why not take advantage of it". With

respect to P.A.I.T., 52% of the firms received grants of less than $100,000, 42% received grants between $100,000 and $500,000 and 6% received grants in excess of $500,000. About 30% of these firms received government assistance for research and development from other sources as well. It was noted that foreign-owned subsidiaries were often best equipped to make an application for government assistance because their corporate resources were of a more sophisticated nature. In two instances, foreign firms established new firms in Canada to take advantage of government assistance programmes.

The Canadian banking system was harshly criticized by most of the interviewees for being overly conservative, and commercially naive in its assessment of business propositions. One interviewee summed it up as follows: "If I could satisfy the criteria for getting a loan from my bank, I would not have to ask for one". Nevertheless, certain of the entrepreneurs who had achieved a degree of commercial profitability, admitted that a reasonable cash flow performance would be a sufficient condition for obtaining loan capital. But showing such a performance was not an easy task for the entrepreneurs, even for those who were managing profitable operations.

At least one-third of the companies interviewed had no precise knowledge of their costs of operations, availability of funds and other yardsticks of commercial performance. Another one-third of the group interviewed had but an approximate

appreciation of their cost and profit performance. It was the rare firm which employed sound accounting procedures. In short, this lack of information not only prevented entrepreneurs from building a good case for obtaining loans from financial institutions, but also hindered them from making effective decisions concerning the future of their firms.

The accounting treatment of research and development is worthy of special attention. At the time companies are established, research and development expenditure may be capitalized rather than treated as expenses in the usual operating fashion, namely, charging them off as they are incurred. This practice has the effect of making the new firm appear as sound as possible. On the other hand, when the firm approaches a financial institution for a loan, it is extremely difficult for the entrepreneur to argue a certain value on the future products that may be realized from the company's research and development programme. Should the company at a later date decrease their assets by the amount of the capitalized research and development component, the impact on current expenses could greatly reduce the profit picture and thus make it more difficult for the entrepreneur to raise loan financing.

RESEARCH AND DEVELOPMENT, INNOVATION AND MANUFACTURING

Seventy per cent of the innovations studied in our sample of 47 companies were of the "adaptive type", i.e. a minor alteration of an existing product. This type of innovation does not perform new functions for the users. The major reasons for engaging in adaptative innovation were as follows: limited availability of funds for research and development, less technical expertise required on the part of the entrepreneur, familiarity with production methods, employment of established distributive networks, and fewer problems encountered in promoting the merits of the "new" product to existing markets.

The remaining innovations studied were all of a "functional type", i.e. while the product remains the same, the method of performing the function is new. In addition to requiring higher research and development expenditures, this type of innovation involves a higher technical breakthrough which would necessitate employing a superior and larger technical group, new production methods as well as designing new distributive systems. Since the prospective users would have to be educated on the merits of this new product or process, marketing costs would be heavy at the time the innovation is being introduced.

Since our study dealt primarily with entrepreneurs

with limited means, it is not surprising that approximately 70% of the innovations were of the adaptive variety. The bulk of this work was of a developmental and design nature, largely conducted in-house. However, it should be noted that approximately two-thirds of the interviewees admitted to utilizing the services of government laboratories, provincial institutes, university facilities and even community colleges. By and large, this technical assistance was obtained at no cost, or at best, at minimal expense, to the entrepreneur. Only one of the 47 entrepreneurs admitted to contracting out his total research and developmental activity. These figures should come as no surprise since the entrepreneurs studied were of the scientific/technical type.

In the case of manufacturing, because of the limited funds at the disposal of the entrepreneur, about 33% of the firms contracted out this activity. In some cases, the suppliers of critical component parts did some of the fabrication work for the entrepreneur. This was particularly so where the entrepreneur was just starting out and his technical input was chiefly one which he produced in his machine shop.

For many of these firms, the machine shop setting constituted both the research and development and manufacturing facilities. As previously noted, the innovation was largely of an adaptive type and manufacturing at the outset consisted primarily of assembling certain standard components with those which were improved on as a result of the innovation.

MARKETING

The marketing performance of the technological entrepreneurs was weak, and was a major factor for the apparent high mortality rate of the projects they had tried to commercialize. Most of the entrepreneurs were unable to see the linkage between product innovation and marketing innovation, i.e. that technical innovation through product modification could only be successful if the benefits were readily perceived by the intended users.

Most of the new product development was carried out and implemented before any attempt was made to assess the market potential and the costs of penetrating the market. Overestimating demand, underestimating competition, ignoring the need to invest in promotion, selection of inefficient and costly distributors, overextension of credit through consignment selling, understaffed sales organization, inadequate warehousing facilities and unreliable delivery and service support were some of the reasons deduced for the problems encountered by the entrepreneurs. It was estimated that only one out of five firms interviewed had a satisfactory marketing organization. At least 85% of the firms interviewed introduced their innovation into a highly or moderately competitive market. In the case of adaptive innovations, the market was almost always highly competitive.

The point to be made is that the love that the entrepreneur has for his product innovation often blinds him from perceiving his real opportunities and the state of market competition. An adaptive product innovation in competition with the giants of the industry is seldom a formula for long term success. About 35% of the innovations studied appeared to have no effective protection either because the invention was questionable, or it was not worth the investment, or because the protection derived from the patent was usually more than off-set by the information disclosed at the time of application. In general, the entrepreneur had little sophistication in the use of patent protection.

In addition to these problems, the limited size of the Canadian market forced many of the entrepreneurs to extend their marketing horizons at least to the U.S. market where they were even less well-equipped to compete. Only 19% of the firms viewed their products as being sold solely in the Canadian market. For 10% of the firms, the export markets predominated, while for the remaining 71% sales would have to be made in both the domestic and foreign markets. It was noticeable, therefore, that these firms were very much aware of the limitations of the size of the Canadian market and the distance separating the centres of population. In addition, they were aware of the international environment in which they operated. In some

instances, as well as being export-oriented, they relied on foreign sources of supply and technology and they were conscious of the development of potentially competing foreign products and processes. Consequently, it was not surprising that a number of the more successful entrepreneurs found themselves tied to the "apron strings" of their larger customers. Small companies, especially producers of single product lines, can seldom sustain the developmental and promotional costs of their own unique brand image when the customers are few in number and account for the bulk of their sales, i.e. the original equipment manufacturers in the automotive, chemical, electrical and mining industries. In fact, large firms will on occasion provide some financial assistance to those entrepreneurs whose project may result in some component innovation.

ROLE OF GOVERNMENT

The view expressed most frequently by the commercially successful entrepreneurs who had received financial support from the government was that the advice and assistance received from government officials had been most valuable to them. The comments most frequently heard were:

(a) That government officials had brought to the attention of entrepreneurs the availability of government support.

(b) That officials had asked questions and made comments about projects which had resulted in the projects being more effectively organized.

(c) That, once success had been achieved, officials had encouraged the entrepreneurs to request further grants for other projects.

From less successful entrepreneurs, there was less satisfaction about the role of the government and about the environment in general. Amongst this second group the complaints most frequently heard were:

(a) That the government did not provide assistance with respect to the marketing of the product or process.

(b) That the government was reluctant to provide additional financing after the first loan or grant had been made, and it could be shown that the project stood a good chance of success with some additional financing.

(c) That the government would not use its purchasing policies to promote the sales of products which government financing had assisted.

(d) That, in general, other federal government departments and provincial governments were not at all helpful in assisting an entrepreneur who had received some federal government assistance.

Knowledge about government assistance programmes for research and development varied enormously among the interviewees. About one in four mentioned that they had heard about the programmes by chance. It is probable that information about the programmes declines as one moves away from central Canada, both east and west. Such imperfections in the knowledge which entrepreneurs have about their environment exists in other areas as well. For example, very little is known by these entrepreneurs about the sources of venture capital in Canada in general. In fact, as much, if not more, is known about U.S. sources of venture capital as about Canadian sources, and a view, frequently expressed, is that Canadian venture

capital is both harder to come by and is more conservative than U.S. venture capital.

There are a number of policy issues which arise out of these comments on the role of the government in assisting entrepreneurship. One of the more fundamental questions to be considered is, under what conditions should the government promote research and development and entrepreneurship in Canada? We do not intend to discuss the theoretical and empirical relationship which links research and development to economic growth and other indicators of economic progress.[8] Rather, we will assume that such a relationship is accepted, and that the question for the policy-maker is how the government can promote this relationship.

In order to examine this question, we will deal with two areas, first, the ways in which entrepreneurship can be related to the industrial goals of Canada, and second, the ways in which the government can assist in promoting entrepreneurship.

Industrial Strategy

One starting point for such a discussion is the identification of the industrial strategy (goals and means) of the country. From our observations, it appears that there is no clear and coherent understanding, either among businessmen or government officials, of what the goals of industrial policy are in Canada. It is known that the government is attempting to promote manufacturing industries in general, as well as other sectors of the economy, but within the manufacturing sector, it is not known which industries are the prime targets for promotion. Our initial point here is that the many programmes of industrial development promoted by different federal government departments (and provincial governments) do not necessarily complement each other and may even offset each other. From the businessman's point of view, he may find himself assisted by one department only to be thwarted by another.

If one considers only those government programmes, which are aimed at promoting research and development and entrepreneurship, it appears to us that an attempt to concentrate efforts on promoting various areas of technology might prove to be the most effective use of the limited resources available.

The goals of an industrial policy will obviously result from political decisions and it is here that we feel

that the Department of Industry, Trade and Commerce, with its first hand knowledge of different industry sectors, can provide an important input. Specifically, there is a need to engage in some form of technical-economic forecasting which will permit the selection of projects which will have a substantial chance of success because they meet an identifiable need. Like other commentators, our observations are that most innovations which fail, do so due to an inability to establish a market, either for technical or for economic reasons.

The process of technical-economic forecasting will have to include the following steps:

(1) An identification of the needs to be met and the problems to be solved.
Needs and problems will have to be related to factors such as the size, age distribution and educational attainment of the population, raw material and energy requirements, availability of capital, balance of payments considerations and international commitments.

(2) An identification of possible practical applications arising from scientific advances. This involves an attempt to match evolving scientific knowledge to the needs and problems outlined above.

The implementation of the findings of this two-step process of forecasting both demand and supply will have to involve decisions as to the responsibilities which different government departments and which different levels of government will have.[9]

Our point here is that serious consideration should be given to ensuring that policies to promote entrepreneurship should be administered within a framework which reveals the objectives of the government's overall industrial policy. The purpose of this approach is to encourage the development of policies by different government departments which are consistent with each other.

Government Promotion of Entrepreneurship

The second area for discussion is the type of role which the government should play in promoting entrepreneurship in Canada. This role can include the undertaking by government of research and development, the financial support of private research and development, the commercialization of innovation by a government-owned firm or by a private firm. Essentially, consideration has to be given to whether programmes should be in-house or contracted-out (the support of private research and development).

Since the government already provides financial support for research and development by private firms, it is in fact acting as a provider of venture capital. The question then arises whether government is so organized that it can effectively fulfill a role of a venture capitalist.

Private venture capitalists, both in Canada and the U.S., note the following:[10]

(a) Frequently a project has to receive a second injection of capital and usually under less attractive conditions than the first was made.

(b) Only a small proportion of the total projects funded are successful so that the return on the successful ones has to be substantial.

(c) A great deal of time and effort is spent on examining projects on a systematic basis, that is to say, a team of researchers working closely together will evaluate a proposal.

(d) Venture capitalists work very closely with the funded companies. For example, they may provide management services, monitor the company's activities on a regular basis and have a seat on the board of directors.

Thus, the characteristics of venture capitalists include the following: a willingness to accept losses and to make large returns on a few successful projects; a willingness to provide additional financing when a project has not achieved its original stated objectives; an insistence on becoming intimately involved with the management of the company; and a set-up which permits a team approach to the evaluation of a project.

There are obviously a number of ways in which a government organization is less suited to engaging in venture-capital activities as is outlined above, than is a privately-owned firm which specialises in this role. First, the government's sources of funds are public funds provided largely by taxation and borrowing. The public may find it difficult to accept the use of such funds for risky ventures, and thus there may be reluctance, for political reasons, for government to fulfill effectively the venture-capital role.

The private venture capitalist's sources of funds are provided by persons who accept and want their funds to be used for such risk-taking activities. In addition, a government organization which achieves a very high return on an investment would tend to be strongly criticized by business interests, because they would not perceive the government in the role of a venture capitalist. One way of obviating this criticism would be to establish a government development corporation whose task would be to provide venture capital for business projects.

Second, a civil servant's career performance tends to be measured by factors which reveal the careful and prudent use of public funds. Having a one-in-ten success record, as is the case for private venture capitalists, and having to make a second loan when the first has not achieved its intended objectives, is hardly consistent with the public image of a responsible civil servant.

Third, close surveillance of a firm's operation can of course be taken by a government department, but few department's are equipped to provide management services, and appointing a government official to a board of directors would be considered the business equivalent of the government invading the "boardrooms of the nation".

Finally, evaluation of projects requires a team effort. While a private venture capitalist specializes in providing this service, government departments tend to use

for evaluation purposes individuals and groups of officials who have other administrative responsibilities, and thus who do not have the same amount of time available to concentrate on project evaluations, and who may lack the required operational expertise.

These foregoing remarks are consistent with our observations of firms in the following areas. First, there was a reluctance of government to provide a second injection of capital, even when there was a chance that it would lead to successful commercialization of the project. Second, a number of firms might have completed their projects if there had been some management assistance provided. Third, most of the projects which received support fell into the category of adaptive innovation (70% of the total).

ENTREPRENEURSHIP AND FOREIGN SUBSIDIARIES

It was noted above that 30% of the firms interviewed would probably have undertaken their projects without the government's financial support which they had received. In particular, it was noted that none of the Canadian subsidiaries of large foreign companies which received support, were in need of capital resources. If the parent company was committed to the project, it would provide the necessary financing. In these instances government programmes were viewed as a cheap source of capital, and if the firm's project qualified for support, the attitude was why not get it. Very little by way of increasing entrepreneurial skills or adding to innovative processes that would not have occurred anyway resulted from these grants.

In some instances, government grants did encourage foreign subsidiaries to locate project developments in Canada which would not otherwise have located here. This may have resulted from deliberate government policy aimed at going out to invite a foreign firm to locate in Canada and using a number of industrial incentive programmes, including research and development, to make the move attractive.

The point about dealing with foreign subsidiaries is that the scope for entrepreneurship and for innovation tends to be different in a foreign subsidiary than in a domestically-

owned firm, and thus the analysis of the foreign subsidiary case will differ from that of the domestically-owned firm.[11]

THE FINANCIAL ENVIRONMENT

It was clear from our interviews that in 25% of the cases knowledge of government incentive programmes had been obtained by chance -- as a result of meeting a government official, politician or fellow businessman, or noticing an article in a newspaper or trade magazine. The point is not that the programmes were necessarily publicised inadequately, but that the small entrepreneur is frequently both unaware of his environmental setting and for various reasons, does not devote the time to examining what sources of financing, both public and private, are available to him. His main institutional financial contact tends to be his local bank, while other sources of financing were shown to be shareholder loans, where the shareholders are often friends, suppliers and customers. It was interesting to note that only a few of the interviewees mentioned the Industrial Development Bank as a source of financing.

Most of the interviewees felt that it would be easier for them to raise venture capital from sources in the U.S. than in Canada, especially for amounts in the $300,000 to $500,000 range. In some instances, this view was based on experience, i.e. hard offers of cash from the U.S., and in some cases it reflected an impression of the environment.

It was clear that, in many instances, the interviewees

were financially inexperienced and that the lack of knowledge of the financial environment and the lack of venture capital institutions placed Canadian entrepreneurs at a disadvantage. This situation is reflected in cases where the project faltered on grounds of inadequate working capital, where the entrepreneur was forced to give up control of the project to financiers, and where competitive forces undermined the successful commercialization of the project.

ENTREPRENEURIAL RESOURCE BASE

Our interpretation of government statements about the promotion of research and development in Canada is that it is the government's objective to promote an environment which will make the most effective use of the available entrepreneurial skills, and to encourage an increase in the pool of entrepreneurial resources.

If we assume that our interviews were conducted with a sample of Canadian entrepreneurs, then, as has been shown earlier, those entrepreneurs who are primarily technically-oriented tend not to possess those management skills which lead to the successful commercialization of a project. The probability of success is enhanced where they can attract and work with a management team. Moreover, most of these technical entrepreneurs work best in an innovative environment and are less keen to see their organization grow and for themselves to become part of the management team of a larger firm. This is not to say that they are uninterested in monetary rewards, but rather that they prefer these rewards while at the same time working in an innovative environment over which they have substantial control.

At the same time, that we recommend that the technical entrepreneur work with persons with management expertise, we also recommend that consideration be given to ways in which those with technical entrepreneurial skills can practise these skills throughout their lifetime. That is to say,

because entrepreneurial skills are scarce, and probably less easy to produce through education and training than management skills, then it is desirable to preserve and utilize effectively these skills. One can visualize two models of successful entrepreneurial development. In Case I, the entrepreneur successfully starts a new firm with a new product or process which receives market acceptance, and the emphasis of the firm shifts from innovation to management. In Case II the entrepreneur starts the new firm and the product or process again receives market acceptance, but the entrepreneur moves on to innovate again, while being financially rewarded for his first project, which is then managed by someone else.

Case II situations would tend to use the entrepreneur's skills in a more effective way. Certainly, there are instances of this occurring, but our view is that consideration should be given to attempting to institutionalize the "spin-off" (Case II) situation, by, for example providing financial facilities and management services either in the private or public sectors.

SUMMARY OBSERVATIONS

There is no single reason which can explain the poor performance of many of the firms in our study. The point at which difficulties arise can usually be traced to the lack of management expertise and judgement exercised by the entrepreneur in the formative stages of the company development. For example, the way in which the operations of the company was initiated may signal that it is likely to fail. Lack of capitalization, over ambitious plans coupled with poor management expertise rarely produce successful results. On the other hand, initial success may be undermined by a fatal managerial error such as over-extension of credit and over-estimation of market potential.

Not all of these difficulties need result in failure. Some of them may be traced to the entrepreneur's frustration, impatience and discouragement arising from his lack of managerial sophistication. What successful businessmen would normally view as temporary setbacks, these entrepreneurs may regard as insurmountable obstacles. Thus, some of the companies which have failed or appear to be failing may never have had a chance of being a success.

The formula for success is largely the opposite of what influences business failure. For example, managerial expertise, particularly when learned from a previously successful business position or venture, adequate capital

resources and realistic expectations go a long way to ensuring the success of a promising venture. The psychological qualities of determination, persistance and endurance are traits often found in successful entrepreneurs.

There is a strong similarity between the problems experienced between our group of newly-established innovative firms and small business in general. The literature on small business behaviour is replete with examples of failure due to factors which include the following:

-- Lack of general management expertise
-- Paternalistic and autocratic managerial approach
-- Excessive preoccupation with control considerations
-- Inability to delegate responsibility
-- Inadequate capitalization
-- Excessive dependence on borrowed capital when available
-- Overextension of credit
-- Unawareness of customer requirements
-- Ignorance of competition
-- Inefficient and costly distributive arrangements
-- Excessive dependence on foreign markets
-- Limited product line
-- Absence of promotion
-- Erratic and discriminatory pricing policies
-- Overestimation of market potential
-- Absence of market research analysis.[12]

Caution should be taken not to draw too close a comparison between the findings of our study and the problems of small business. Our study dealt with firms which were described as technologically-innovative in the formative stages of company development and were in the manufacturing sector. The literature on small business emphasises firms already established and largely in the service sector of the economy.

In the introduction to our study we listed Professor Cole's six areas of business activity leading to successful entrepreneurship. We noted that failure to perform satisfactorily in these six areas may be sufficient cause for the entrepreneur to fail in commercializing his innovation. The findings of our study support this contention.

FOOTNOTES

[1] Business Enterprise in Its Social Setting (Cambridge, Harvard University Press, 1959), p.7.

[2] In The Business System - Readings Vol. 1, Eds. C. Walton and R. Eels (New York, MacMillan Co. 1967), pp. 399-400.

[3] A. C. Cooper, "The Palo Alto Experience", Industrial Research, May 1970, pp. 58-60.

[4] A. Vanterpool, The Potential for Science-Based Industry in the Halifax-Dartmouth Area, Ottawa, Department of Regional Economic Expansion, January 1971, p.28.

[5] W. Lazer and W. Bell, "The Concept and Process of Innovation", in E. T. Kelley and W. Lazer (EDS) Managerial Marketing: Perspectives and Viewpoints, R.D. Irwin Publishers, Homewood, Illinois, 1967, pp. 284-291.

[6] A detailed discussion of entrepreneurship in a selected area in the Atlantic provinces can be found in A. Vanterpool, Op.Cit.

[7] For a detailed discussion of negative factors, see A. C. Cooper, Op.Cit.

[8] For general discussion, see N. H. Lithwick, Canada's Science Policy (Toronto, Methuen, 1969).

[9] For further discussions of an industrial strategy, see I. A. Litvak and C. J. Maule "Foreign-owned Subsidiaries as an Instrument of Host Government Policies", paper presented to the McGill Conference on the Multinational Corporation, August 25, 1971 (to be published by McGill University); and M. Zvegintzov, "Techological Innovation", Long Range Planning, December 1968, pp. 46-52.

[10] For example, see Venture Capital, Report of Conference held at the School of Business, University of Toronto, September 28 and 29, 1970; and "The Golden Equation of Venture Capital", Dun's Review, September 1969, pp. 43 to 45.

[11] See I. A. Litvak and C. J. Maule "Entrepreneurship Corporate Citizenship and the Branch Plan", SCIENCE FORUM, Vol. 4, No. 4, August, 1971.

[12] For an excellent annotated bibliography on the subject of small business, see R. V. Davies, Success and Failure Factors of Small Business, Ottawa, Department of Manpower and Immigration, September, 1967.

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