Technological Innovation Studies Program

Research Report

CHARACTERISTICS AND PROBLEMS OF SMALL AND MEDIUM EXPORTING FIRMS IN THE QUEBEC MANUFACTURING SECTOR WITH SPECIAL EMPHASIS ON THOSE USING ADVANCED PRODUCTION TECHNIQUES

Gérard Garnier
Faculty of Management
University of Sherbrooke

August, 1974

#8

Rapport de recherche

Programme des études sur les innovations techniques

Industry, Trade and Commerce
Technology Branch
Ottawa, Canada

Industrie et Commerce
Direction de la technologie
Ottawa, Canada

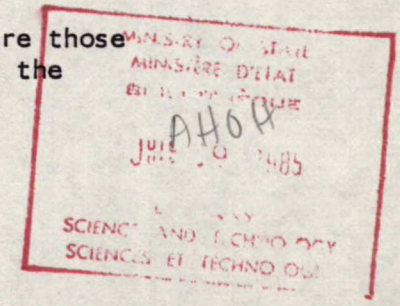
CHARACTERISTICS AND PROBLEMS OF SMALL AND MEDIUM EXPORTING FIRMS IN THE QUEBEC MANUFACTURING SECTOR WITH SPECIAL EMPHASIS ON THOSE USING ADVANCED PRODUCTION TECHNIQUES

Gérard Garnier
Faculty of Management
University of Sherbrooke

August, 1974

#8

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



CHARACTERISTICS AND PROBLEMS OF SMALL AND MEDIUM EXPORTING FIRMS IN THE QUEBEC MANUFACTURING SECTOR WITH SPECIAL EMPHASIS ON THOSE USING ADVANCED PRODUCTION TECHNIQUES - GERARD GARNIER

E X E C U T I V E S U M M A R Y

OBJECTIVE

The purpose of this study is to show the characteristics and the problems of some small and medium firms in Quebec which export part of their production, and which use advanced production techniques.

In particular the study tries to answer three questions:

1. Is there a relationship between the technological character of a firm and the fact that it does or does not export?

2. Is there a link between the fact that a firm exports and its long term sales growth rate?

3. What are the main characteristics of exporting firms which differentiate them a priori from non-exporting firms?

APPROACH USED

A general questionnaire was sent to 410 companies of which 171 replied. Several months later, a second more specific questionnaire was sent to the same companies, of which 146 replies were obtained. In addition, two series of interviews were conducted, making a total of fifty interviews.

PRECIS

All companies were divided into two categories, those which export, and those which sell only in the domestic market. The following characteristics of these two categories were compared:

1. Characteristic factors of the environment, such as economic, socio-cultural, and legal context of the market structure.

2. The characteristic factors of the company itself, that is, the way in which management perceives the environment and attempts to adjust to it.

3. The characteristic features of the entrepreneur.

Of the firms studied, 47 sold only in Canada while 36 exported. In this sample, the aircraft industry exported a great deal, the chemical industry hardly exported at all. In addition, non-ferrous metals, and non-electric machinery exported more.

CONCLUSIONS

Four factors played a fundamental role on whether companies exported or not: -

1. The probability that a company will export is greater, the larger the company.

2. The type of industry is important. Some types of industries, such as non-ferrous metals have comparative advantages over other types of industries.

3. Foreign subsidiaries export more than purely national companies. This occurs because of policies to serve many countries from one regional production centre.

4. Companies carrying out greater research are likely to export.

Financial factors, and the personality and characteristics of the entrepreneur do not seem to have a great influence on exports.

CHARACTERISTICS AND PROBLEMS OF SMALL AND MEDIUM EXPORTING FIRMS IN THE QUEBEC MANUFACTURING SECTOR WITH SPECIAL EMPHASIS ON THOSE USING ADVANCED PRODUCTION TECHNIQUES

FACULTY OF MANAGEMENT

UNIVERSITY OF SHERBROOKE

AUGUST 1974

TABLE OF CONTENTS

Page

Page

d) Legal status of the firm: subsidiary or independent company?

B) Management philosophy and the resulting policies

a) General administration and planning:

b) Company product policy

c) Research and development policy

d) Financial policy

3. Characteristic features of the entrepreneur

1) Age

2) Ethnic origin

3) Level and area of education

4) Type of experience

5) Taste for risk-taking

6) Ability to delegate authority

V ANALYSIS OF RESULTS

A) Dependent variable: whether or not they export

B) Explanatory variables

I. Characteristic factors of the environment

1. Characteristic factors of the industry:

a) General character of the industry and intensity of demand for the products of the industry

b) Competition

2. Incentives for export

II. Characteristic factors of the company

1. Physical characteristics of the company

a) Age of the firm:

b) Size of the firm

Page

CHARACTERISTICS AND PROBLEMS OF SMALL AND MEDIUM EXPORTING FIRMS IN THE QUEBEC MANUFACTURING SECTOR, WITH SPECIAL EMPHASIS ON THOSE WHICH USE ADVANCED PRODUCTION TECHNIQUES.

Gérard GARNIER

Sherbrooke University

I. INTRODUCTION

Canada has a so-called "open economy"; during the last ten years or so it exported on the average between 18% to 20% of everything it produced; conversely, it purchased abroad between 15% and 20% of everything it consumed. These figures demonstrate the importance of foreign trade to our country. However, a close look at the statistics reveals that the Canadian provinces, the various industries and firms do not all share to the same extent in the flow of foreign trade. Let us take a quick glance at the different reasons for the disparities. First, as far as the provinces are concerned, three amongst them alone account for nearly all of the country's exports: in 1968 the combined exports from Ontario, Quebec and British Columbia represented a value of $11,571,320,* i.e. 87% of the Canadian total of $13,250,960.* (1) Quebec, for its part, generally ranks second amongst the exporting provinces. Its sales abroad fluctuate between three and four billion dollars per year ($3,588,066.000 in 1972) and represent between 20% and 25% of all Canadian exports (19.5% in 1972). (2)

(1) Statistics Canada: Trade in Canada Volume I. Summary tables and analyses 1966-68, Ottawa, April 1971. Table 14. National exports and re-exports per entry port.

(2) Quebec Statistical Office Exportations Internationales et réexportations par port de douane.

* Translator's Note: Should read billions?

Now, turning to industry (or more specifically to activity sectors) we note equally great disparities as far as exports are concerned. If all export activities are divided into 9 large sections, according to the standard classification for International Trade (Standard International Trade Classification or S.I.T.C.) we note that 3 of them represented 77.6% of Canadian exports in 1968, or a value of $10,557,864.000. (3) They are - in decreasing order of magnitude - machinery and transport equipment (section 7), non-comestible raw materials (section 2), and finally, manufactured articles classified according to raw materials (section 6). This last category includes mainly metals, that is, semi-processed raw materials. Finally, although there are no precise statistics on the subject, it is generally believed that the most export business is in the hands of large and even of giant corporations. Is this really so? If so, why do small companies export so little? Which are the factors which motivate some companies to export while others are content with the domestic market? Is there, as claimed, a link between the more or less advanced technology of a company's production and the fact that it does or does not export? Is there a relationship between exporting and the long-term success of the company? These are some of the questions which we will examine in this report.

It may seem strange to wish to revert to the export problem, which is one of the oldest concerns of economists. However, although this problem has been studied in detail at the macro-economic level, up to now the micro-economic approach has been virtually ignored. We are quite capable of explaining why some countries export; we can forecast to which

(3) Statistics Canada, id. Table 37.

market their goods will be directed; one may even be able to predict the global value of their exports in terms of income of their principal clients. Also, within an exporting country, we can explain why some industries export more than others. But hardly anybody ever went further: we still do not know why some enterprises export while others, in the same industry, only sell within their own national borders. We intend to study this problem within the specific framework of small and medium manufacturing enterprises (S.M.E.) in Quebec.

II. OBJECTIVES AND PLAN OF THE STUDY

From a general point of view the problem of determining motives for export is extraordinarily complex and exceeds somewhat the very restricted scope of this modest study whose limits should be established first.

1) This study is certainly not intended to establish a theory of exporting companies. It is essentially an empirical investigation meant to show the characteristics and the problems of some categories of small and medium firms in Quebec and is not intended to establish a general model to "explain" why some companies export and others do not. This, however, does not mean that our results would have no explanatory or forecasting value but simply that their scope is limited and that they really only apply to the type of company on which this study is based.

2) This study will be limited only to small and medium firms (S.M.E.) as defined below. From the geographical point of view it will deal only with companies established in Quebec, be they independent firms or subsidiaries of other Canadian or foreign corporations.

3) Finally, within this sub-population, we are interested only in a specific category of S.M.E., those which use advanced production techniques. Once again, this term will be defined later.

With the scope of our study well defined, we are now in a position to state our objective, which is to answer the three fundamental questions mentioned earlier, i.e.

1) Is there a relationship between the technological character of a firm and the fact that it does or does not export? We shall examine the arguments put forward in support of such a relationship by various authors and we will attempt to determine how they apply to our sample.

2) Is there a link between the fact that a firm exports and its success, the latter being represented by its long-term sales growth rate? Once again we shall examine the theoretical arguments supporting such a relationship, next we shall analyse the data to see how they apply.

3) What are the main characteristics of exporting firms which differentiate them a priori from non-exporting firms? One might restate this problem somewhat differently, i.e. which factors make it possible to "explain" why some firms export while others do not?

Actually, this paper will be divided into 3 major sections: first, (chapter III) we describe the methodology used: definition of population, characteristics of the sample and analytical methods used. Next (chapter IV) deals in detail with the variables. In the third section, (chapter V) we present the results of our study. Finally, we conclude with a brief summary of the essential facts of this investigation.

III. METHODOLOGY

This paper is the follow-up of research on the factors influencing success or failure of manufacturing S.M.E. in Quebec (1), carried out on behalf of the Federal Department of Trade and Commerce where we had briefly touched on the role of exports as a factor in the success of a firm. In order to facilitate comparison between the two studies we have used the same type of methodology and specially the same definitions. Consequently, in this chapter we will confine ourselves to a brief review of the definitions used in both studies, while referring to the earlier paper for more detailed development.

This chapter has three sections:

1) Definition of the population.

2 Methods used for gathering information.

3) Methods used to analyse the data obtained.

1) Definition of the population:

As stated earlier, our study will involve only a small portion of Quebec manufacturing firms. Actually, the population to be studied could be defined as the small and medium enterprises (S.M.E.) in the manufacturing sector established in Quebec using advanced production techniques. These terms must still be defined.

a) Definition of small and medium enterprises:

As in the earlier study, for practical reasons, we decided to define the size of a firm in terms of the number of its employees. It would

(1) Gérard GARNIER and Jean ROBIDOUX: Facteurs de success et faiblesses des petites et moyennes entreprises manufacturières au Québec, spécialement des entreprises utilisant des techniques de production avancées. (Success Factors and Shortcomings of small and medium manufacturing companies in Quebec, especially those using advanced production techniques). December 1973, Management Faculty, University of Sherbrooke.

probably have been preferable to select our sample population according to such criteria as business volume, or amount of assets but at the outset the only figures available to us were the number of employees in each firm. Actually, we defined S.M.E. as enterprises having between 5 and 250 employees in 1973. We eliminated firms with fewer than 5 employees since they are artisan shops whose economic impact is negligible.

b) Definition of companies and industry using advanced production techniques.

It became quickly apparent that it would be impossible to distinguish technically advanced enterprises from others merely from statistical data, regardless of the criteria for defining advanced techniques. The only statistical data available referred to technological data on entire industries and often on activity sectors comprising several industries. Therefore it was decided to select advanced technological industries and to consider all companies in that industry as enterprises using advanced technology. It remained for us to define what was meant by "technological" industry (and consequently by "technological" firm) or by an industry "using advanced production techniques." Obviously, it was not possible to establish in advance the type of technology actually used by each industry and to decide whether it was advanced or not. Most experts relate the technology of an industry to some research criterion. We have used three research-based criteria to determine whether an industry was technological or not:

1) The amount spent on research (R&D) for every $100 of sales volume; this amount includes "in-house" expenditures, i.e. within the company, as well as "extra-muros" funds. It also includes operating expenditures plant.

2) The number of employees engaged in research for every 1000 employees.

3) The number of scientists and technicians engaged in research for every 1000 employees.

Statistics Canada, in its publication entitled "Expenditures for Research and Industrial Development in Canada - 1967" (1), details of which are published in Appendix 1, furnished the necessary statistics for each group of industries. For each of the three above criteria we determined the average for all manufacturing industries and selected those industries which exceeded this average for at least one of the three criteria mentioned, the first, however, being considered the most important one. Thus we selected 8 industries which henceforth will be considered technological industries; they are:

a) the rubber industry

b) the non-ferrous metal industry

c) the non-electric machinery industry

d) the aircraft and parts industry

e) the electrical appliance industry

f) the oil and coal industry

g) the pharmaceutical products industry

h) the other chemical products industry.

One might take issue with the above procedure because, for example, it selects the population sample, that is, the Quebec S.M.E. using advanced technology, on the basis of criteria which really apply only to entire industries and to Canada as a whole. In fact, it is unlikely that there

(1) Statistics Canada: Expenditures for research and industrial development in Canada, 1967. Ottawa, February 1970.

are major differences between provinces in the degree of technology of a given industry. One might also object that this method will inevitably lead to the inclusion of some less technologically advanced firms in our sample, since all industries - even the most technically advanced ones - will contain some firms less advanced than others. The advantage of this method is that it allows a comparison between the most technically advanced firms and those that are less advanced. Moreover, there is no absolute level of technology as such, there are only relative levels; in other words, some firms are more technically advanced than others. By selecting firms in the most technically advanced industries there is a better chance that the great majority of them would have quite a high level of technology. We must add that our previous study seemed to confirm this relationship between the level of technology of an industry and that of the firms engaged in it.

The most serious objection might be that the criteria for research intensity used are based on data which refer to all Canadian enterprises and that the large companies do most of the research in terms of absolute value. The industries are thus selected on the basis of data applicable mainly to large corporations. The selection might have been different if separate data had been available for companies with fewer than 250 employees. Due to this lack of statistics, it was not possible to check this hypothesis directly but it seems unlikely that the research intensity for small companies would be radically different from the average intensity for all enterprises. Therefore, there is reason to believe that our selection criteria are valid; all the more so since there is a very

marked difference in terms of intensity of research between the eight industries selected and the others.

Finally, the criteria used make it possible to define accurately the population covered by the present study. It was possible to establish a list of the enterprises which made up our sample from the Repertory of Manufacturing Establishments (Répertoires des établissements manufacturièrs) published for each industries by the Quebec Statistics Office. The total number of S.M.E. in the eight industries amounted to 410 companies whose breakdown for each industry appears in APPENDIX II.

2. Information gathering methods:

Due to the nearly total lack of basic data on the population to be studied, we had to envisage gathering the fundamental statistics ourselves in addition to the more specialized information needed for our study. Under the circumstances, the most practical and least cumbersome method is that of the questionnaire, all the more so since the total population was limited to some 400 enterprises. We decided to contact every firm in the sample population rather than to select a sample and to extrapolate the data gathered for this sample to the entire population. However, the questionnaire method also has its drawbacks: it is impossible to determine the number of questionnaires which will be completed nor the rate of responsiveness to the different questions; the questions may be misunderstood or the answers appear vague, and finally and above all, the rigidity of the questionnaire does not allow for particular conditions in each industry and even less in each company. To make up for these shortcomings

it seemed necessary to carry out a number of interviews with selected companies, once the basic information was obtained from the analysis of the questionnaires. In fact, our research was carried out in three stages:

a) First, we sent a rather general questionnaire to the 410 enterprises in our population. This first questionnaire aimed at gathering basic information, especially statistical information which could not be obtained elsewhere. After two reminders by mail and a number of telephone calls, we collected 171 questionnaires, representing 42% of the population. However, some of the questionnaires were not completed in full, for example, many enterprises refused to reveal their financial data. In fact, 83 questionnaires supplied enough information to be considered reasonably complete. These 83 companies furnished sufficient financial data to enable us to compute their long-term growth rate, a rate which we used as a success index for the company throughout the study. Thus, our basic "sample" consisted of 83 firms and was the basis for most of the statistical analysis to be explained in detail later. The sample represents about 20% of the population which is adequate; the distribution of the companies per industry does not differ significantly from that of the population as a whole (APPENDIX II).

b) Next, several months after sending out the first questionnaires, we sent a second series of questionnaires to the same 410 enterprises which made up our basic population. This follow-up questionnaire was more specialized than the first and was intended to obtain data on export activities as well as on the different factors which distinguish exporting enterprises from other companies. 146 questionnaires completed in different degrees covering about 36% of the firms of the sample were

returned. APPENDIX II indicates their distribution among the eight industries selected. The makeup of the second sample hardly differs from that of the population and seems to be better balanced than that of the first sample. In fact it seems that both our samples are quite representative for the population, at least as far as the distribution among the eight industries selected is concerned.

c) To limit the shortcomings of a questionnaire survey as far as possible, we conducted a number of interviews with the companies selected, once the basic data collected from the questionnaires had been analyzed. We carried out two series of personal interviews with the managers of S.M.E., one after the return of the first questionnaire and the other after the return of the second. Altogether we conducted more than fifty personal interviews, in addition to many telephone interviews. These interviews had a triple objective: first, to obtain more information on some items which had been omitted in the questionnaires by many companies, especially in the field of financial data; next, to gather more data on companies in some industries relatively underrepresented in our sample; finally, to establish personal contact with the firms and their problems. In this manner we were able to familiarize ourselves with the particular conditions in each industry and gather general comments from many executives.

3. Analytical method used:

The very nature of the phenomenon under study, i.e. whether the companies did or did not export, together with the refusal of many

companies to furnish precise figures on the amount of their exports, made it difficult to establish a complex quantitative model, especially a model based on multiple regression. Therefore, we confined ourselves to the analysis of the data with double entry tables, one entry being usually a dependent variable, i.e. whether they did or did not export. From the practical point of view, the analysis was carried out with the MINI-TAB TABLES programme which furnishes chi-square measures between the variables as well as gamma test values (a type of correlation coefficient). Therefore it was easy to carry out statistical testing of the independence of the variables.

IV - THE MODEL - STUDY OF THE DIFFERENT VARIABLES

Edith Penrose in her book "The Theory of the Growth of the Firm" writes "Firms do not just grow automatically, but in response to human decisions". (1) One might justifiably substitute the word "export" for "growth". The fact of exporting is no less a random result than development or growth. On the contrary, it is the result of a number of decisions deliberately made by the executives of the company. Even in the simplest of cases where the foreign client requests that the company sell to him, the decision to export will entail changes in the routine of the company. Moreover, in most cases, exporting presupposes foreign market research, development of techniques for delivering goods outside the country, familiarization with the use of foreign currencies, etc.... Export prospectives will force a company sooner or later to revise its production, distribution, sales and financing policies, etc...

(1) Edith T. PENROSE: "The Theory of the Growth of the Firm", p. 31, New York, John Wiley and Sons, Inc., 1959.

Therefore, even if at the start motivation for exporting is purely accidental, it cannot turn into an exporting process without a decision taken by the company executives. In other words, the fact that some firms export is not coincidence but the response of their managers to certain stimuli, to certain causes. These causes are what we will attempt to highlight. For some authors exports are tied to the growth of an enterprise: it is one of the alternatives open to a company in full growth. As a company grows, passing from the local to the regional and then to the national market, it comes up against increasingly strong competition from companies with national scope. If competition becomes very strong the company may see its growth restricted or definitively stopped. Exporting may then be the solution which allows it to increase its production without meeting much resistance.

Other authors relate the problem of exports to the "product or products cycle" of the company. This product cycle theory has been presented in its best known form by Raymond VERNON (1) although other authors like HUFBAUER (2) had already established the principle some time earlier. We shall deal with all these theories in more detail when we deal with the causes for export (independent variables) and especially when we present the result of our survey. For now we only wish to retain the idea that the fact that some companies export and other don't is related to well-defined causes which we shall attempt to demonstrate.

(1) R. VERNON: International Investment and International Trade in the Product Cycle, Quarterly Journal of Economics, May 1966, pp. 190-207.

(2) G.C. HUFBAUER: "Synthetic Materials and the Theory of International Trade," London: Gerald Duckworth and Co., 1965.

It is possible to represent the problem of exports by small and medium-sized firms in the form of a linear model, based on multiple regression where the dependent variable would be the amount of exports of a company for a given year and would vary with a certain number of independent variables. One would thus get an instantaneous model whose results could be generalized by using data covering several years, integrating these time series data into those of instantaneous cross-sections through the pooling method.

Unfortunately a great number of companies refused to furnish figures, in particular to reveal the exact amount of their exports. Therefore, we had to do without a quantitative dependent variable and also had to relinquish the multiple regression model. We limited ourselves therefore to an analysis of the results with double-entry tables using the dependent variable (exporting or non-exporting company) as one of the entries.

A) Dependent variable:

In fact, we had to use a binary dependent variable. We divided all companies which had answered the questionnaire into two categories: those which export and those which sell only in the domestic market and attempted to explain this difference in conduct by a number of factors which represent independent variables.

The meaning of the term "exports" may be ambiguous in the case of companies in a province like Quebec. Let us explain immediately what we mean by exports, i.e. sales outside of Canada and inter-provincial transactions are of course excluded. In fact, the problem arises only

with regard to statistics and only at the macro-economic level in dealing with the question of what is understood by exports from Quebec and of assessing the amount of these exports. We have adopted the method used by the Quebec Statistics Office and by Statistics Canada, which includes the value of all goods loaded in Quebec for foreign destinations under international exports from Quebec. This is an approximation of the true amount of exports from Quebec but they are the only statistical data available. We shall come back to this problem later.

B) Explanatory variables:

The reasons why a company may decide to sell its products outside of Canada may be manifold. We have grouped together all the factors which may influence the decision to export in three broad categories:

1. Characteristic factors of the environment: in other words, of the economic, socio-cultural and legal context of the market structure. For example, it is well-known that some industries export a great deal; the companies in these industries are under strong pressure to export since exporting may represent a decisive competitive factor. In general, companies, especially small ones, only have negligible influence on these factors. They can only adjust as best they can to the pressures of the environment to which they are exposed.

2. The characteristic factors of the company itself: These factors are the result of company policies, in other words of the way in which management perceives the environment and attempts to adjust to it. While management has only little influence on the environment, it does on the other hand have a great impact on the company, which it can change

nearly at will, although some changes are only possible over a relatively long period.

3. The characteristic features of the entrepreneur: In the case of a small company one might say that the company is to some extent identified with the man who founded and runs it, with the person whom we call the entrepreneur; it is the result of the ideas of that person, the measure of his managerial, technical and financial skill as well as of his business acumen. There are many definitions for an entrepreneur but they all coincide in this designating a person who assumes the risk of the operation, who is capable of determining the type of product or service which does not yet exist but which the consumers need, who is able to transform a theoretical idea into a practical product which meets the needs of the market. If a small company is thus identified with its entrepreneur-manager, one can expect to find some relationship between its broad guidelines and policies, such as whether it exports, and the personality and ideas of the entrepreneur. This we shall attempt to explore.

Finally, the model we propose may be described as follows: the fact of whether a company exports or does not export depends essentially on the conditions in the industry of which it is a part, mainly on the conditions of demand, both abroad and at home, on the characteristics of the company, its physical and political characteristics over a number of years and finally on the characteristics of the entrepreneur who runs it. We shall now look in more detail at the individual factors which make up each of the three categories.

DETAILED DESCRIPTION OF THE MODEL:

The three categories of factors which we have just defined tend to overlap since some factors may be listed under several categories hence the classification is somewhat arbitrary.

1. Factors characteristic for the environment:

These are external factors over which the firm has practically no control. While there may be hundreds of such factors which can affect the decision to export, we shall confine our study to the most important ones which we have divided into two groups:

a) Factors characteristic for the industry: both domestic and foreign demand for the products of the industry - competition and concentration of firms.

b) Incentive factors for export, such as government subsidies, the services provided by the Société pour l'Expansion des Exportations (Export Development Company.)

Let us briefly review the factors falling into these two groups:

A. Factors characteristic for the industry:

a) Generalities and demand for the products of the industry.

The study of the factors characteristic for the industry enables us to combine the traditional macro-economic approach to the export problem with the micro-economic approach which represents the basis for this study. The classical theory of international trade states that every country has an interest in specializing in the export of certain products, i.e. those intensively utilizing production factors which are in plentiful supply and therefore low-priced.

Conversely, they tend to import the other products. This amounts to saying that in fact some industries will export much more than others and that one can expect to find a larger proportion of exporting firms among the former group than among the latter (although this is equally dependent on the amount of exports by firm, on their concentration). This scheme may be affected by foreign demand conditions in the sense that the mere fact that an industry has a comparative cost advantage over their foreign competitors is not enough to ensure it large exports, there must also exist some demand for its products in other countries. It is not within the scope of this study to present an empirical verification of the classical theory of international trade. We shall confine ourselves to ascertaining whether the eight industries selected on the basis of the degree of technology of their production are better qualified to export than the average manufacturing industry in Quebec or in Canada and whether there are considerable differences among them with regard to the production percentage which is exported and finally we will outline some answers. We shall emphasize only three explanatory factors, namely, the influence of foreign and domestic demand on exports, that of competition and finally the importance of the research factor. Then we shall attempt to establish a link between macro-economic analysis at the industry level and micro-economic analysis at the level of the firm.

b) Competition and Concentration of firms:

There are two types of competing companies: Canadian companies on the one hand and foreign firms selling to Canada, on the other. It is true, that if, in a given industry, the main domestic competitors of a

company engage in exports, this will represent a very great incentive for this company in its turn to consider selling abroad. By selling abroad, the competing companies may actually increase their production volume, which will enable them to take advantage of the economy of scale and thus lower their current production costs and perhaps also their sales price not only abroad, but also in Canada. Exporting may - if competition within the industry is relatively strong (relatively narrow profit margins) - bring about a considerable competitive advantage, which no company can concede its rivals without, sooner or later, putting its own existence in jeopardy. One can thus expect to find a link between the intensity of competition within an industry and the percentage of exporting companies. The problem is similar in the case of foreign competition. If foreign companies attempt to break into the Canadian market, the reaction of Canadian companies will consist in counter-attacking on these foreign companies' markets. There again we can expect a positive relationship between the intensity of competition and exports.

B. Incentive factors for export.

Canada, like most other countries, attempts to develop its exports by offering various kinds of subsidies and services to companies planning to sell beyond the national borders. Although these measures and services are available to all companies, some take greater advantage of them than others and certain firms use them more frequently than others. Which companies use these services most and why? This is what we shall attempt to determine.

2. Factors characteristic to the firm.

There again we can divide the factors of this category into two large groups:

a) The physical variables, which describe the firms characteristics at a given moment: its age, size, number of customers, etc.

b) The variables representing the management philosophy expressed by its executives when facing the problems of the company: planning methods, general policy concerning the range of manufactured goods, research policy, etc.

A. The physical variables.

a) Age of the firm:

It is easy to imagine that a young company struggling to gain its share of the local or national market has probably no time to concern itself with export problems and will tend to delay efforts to search for foreign markets. However, once it is well established and its share of the domestic market has stabilized, it realizes that great efforts must be made in order to conquer a further share of the market from its competitors. Exports may represent an attractive opportunity for continuing growth.

b) The size of the company:

Age and size are frequently related, the oldest firms generally being the largest ones. The arguments presented earlier apply here as well. Furthermore, a firm which for the first time plans to search for foreign markets and to export must be prepared to spend certain fixed amounts not related to the size of the company, such as the costs of establishing an export department, cost of research, etc. This means that in proportion to the amount of sales it is cheaper for a large firm to export than for a small one. We shall thus attempt to verify

empirically whether size is an important criterion for the fact of whether a firm does or does not export.

c) Number of customers: concentration or diversification:

We shall see later that according to the Federal Department of Trade and Commerce, it seems that subsidiaries of foreign corporations export more than strictly Canadian ones, but that a considerable proportion of their sales goes to their parent-companies. Their foreign sales are thus concentrated on a few customers. We shall attempt to verify whether - in our sample - there is a link between exports and the concentration of the number of domestic and foreign customers.

d) Legal status of the firm: Subsidiary or independent Firm

Different reports on "Subsidiaries of foreign companies" published by the Department of Trade and Commerce show clearly that "for every year of the period between 1964 and 1969 export sales of these companies have accounted for a large proportion of total Canadian exports" (1) and that in general subsidiaries of foreign companies tend to export more than strictly Canadian companies. Granted that the subsidiaries covered by these reports are large firms but it is also likely that the same phenomenon would be encountered in the case of the small subsidiaries which make up our sample. It must be stressed in this connection that the fact that subsidiaries are included in our sample raises problems of methodology. First, even if they employ fewer than 250 employees, can one really speak of S.M.E. in their case, when the global corporations of which they are a part are multi-national giants with assets of several billion dollars? To what extent is the amount of their research expenditures a valid indicator for the technical benefits they derive?

(1) Department of Trade and Commerce: "Canadian subsidiaries of foreign companies, 1964-1971," p. 7, Ottawa, Information Canada.

Finally, can one really speak of an entrepreneur in the case of the manager of a subsidiary? On the other hand, to eliminate the subsidiaries would amount to deleting from 30% to 40% of the firms covered which meet the criteria established for S.M.E. To what extent would the remaining individual independent firms represent the population we intend to study? Under these circumstances, we decided to include the subsidiaries in our sample and to determine their importance in the total S.M.E. exports.

B) Management philosophy and the policies it entails:

a) General management and planning:

We indicated earlier that the fact that some firms export is not due to coincidence. The exporting process is the result of a deliberate decision taken by the executives who have weighed the advantages and disadvantages of this move in terms of the firm's objectives and its human, financial and production resources. In other words, the decision to export is the result of planning. It is thus logical to believe that firms which have already set up a planning mechanism for their other activities will be in a better position to assess the advantages and drawbacks of exportation and would thus stand a better chance to arrive at a positive decision than others. Financial considerations tend to support this hypothesis: in fact, the setting up of an export department and a foreign market research department requires a considerable investment at the outset, but this investment will be lower if there is already machinery in place for market study and planning; it would then suffice to have some department staff members specializing in

foreign market study. Be that as it may, we can expect to find a larger proportion of exporting firms among those which already have a well-developed planning department than among others. We shall attempt to verify this hypothesis by relating exportation to the existence of long-term and short-term planning in the three broad functions: finance, marketing and production.

b) Firms' policies regarding the products they sell:

Several authors have related the fact that some industries export more than others to the characteristics of their products. For VERNON (1), HUFBAUER (2) and WELLS (3) exports are linked to what they call the "product cycle". On the other hand, for GRUBER' MEHTA and VERNON (4) as well as for D. KEESING (5) there is a close tie between exports and the intensity of the research effort of the industry. We shall examine this latter position in detail when we speak of the influence of research. Thus we shall only deal with the first theory here. The product cycle theory has been proposed mainly by VERNON to explain the makeup of American foreign trade. In this sense it does not necessarily apply to foreign trade of other countries, although it should be possible to use

(1) R. VERNON: International Investment and International Trade in the Product Cycle, Quarterly Journal of Economics, May 1966, pp. 190-207.

(2) G.C. HUFBAUER: Synthetic Materials and the Theory of International Trade, London, Gerald Duckworth and Co., 1965.

(3) Louis T. WELLS: Test of a product cycle model of International Trade: U.S. export of consumer durables. Quarterly Journal of Economics, February 1969, pp. 152-162.

(4) W. GRUBER, D. MEHTA and R. VERNON: The R & D factor in International Trade and International Investment of United States Industries, Journal of Political Economy, February 1967, pp. 29-38.

(5) Donald KEESING: The Impact of Research and Development on United States Trade, Journal of Political Economy, February 1967, pp. 38-48.

the theoretical principles on which it is based to determine the nature of exports of other countries. For Vernon, the life of a product goes through three broad stages between the moment when it is created (its birth) and the time when it is withdrawn; or if one prefers, three stages of development. At the start it is a "new product", then it becomes a "maturing product" and it winds up its life cycle as a "standard product". To this product development cycle corresponds a production and sales cycle which, according to WELLS, is made up of four stages to which we would like to add a fifth:

(1) The first stage is that of the launching of a product. According to Wells and Vernon, most new products, especially if they are products aimed at the affluent consumer and products intended to replace human labour by automation, stand a better chance when launched and manufactured in the United States than elsewhere. At this stage, the product is manufactured in small quantities at relatively high cost for high-income customers (income-elasticity of the demand is high) for whom price is secondary (price elasticity is low). The manufacturer has a near monopoly. While the main market is the domestic market of the United States because of its size and its wealth, there will soon be some demand abroad; however, exports are still negligible.

(2) The product is now well launched and is headed towards the maturity stage. Mass-production is being planned and price considerations begin to prevail over technical features. Demand abroad is rising and exports absorb an increasing share of the American production. For Wells this stage is no different from the previous one.

(3) At a given moment the question arises whether to product abroad. The product is now being mass-produced: it has reached the "standardization stage". Cost considerations will now decide the site of production plants. Foreign demand is growing and is translated into a considerable increase in exports. Generally production costs, especially labour costs, are lower abroad than in the United States. If shipping costs are added, there comes a moment when it becomes more profitable to product in various foreign countries to keep the domestic market supplied. American exports will start to drop.

(4) Production costs of a given product abroad continue to drop compared to American costs so that the USA-produced goods will sell less and less abroad. American exports continue to drop.

(5) Finally, the difference in production costs of the same product become so great that the United States will stop producing at home and will buy from foreign subsidiaries of their firms or from foreign manufacturers. Exports thus become imports.

It is not within the scope of our study to verify this complex theory in detail; moreover, it does not necessarily apply to Quebec conditions. We will confine ourselves to examining whether there are differences between different kinds of products as far as exports are concerned. One might, in particular, expect that firms which launch many new products, or the majority of whose products are still at the "new product" or "mature product" stage, export more than those which manufacture fewer products, several of which will necessarily be "standard products". We will also examine directly whether firms which manufacture "standard products" export less than others as stipulated by Vernon's

theory. Then we will see whether the relationship between a firm's prices and those of competing products has any effect on sales abroad.

c) R & D policies:

As stressed by Wells, there is a rather obvious relationship between the product cycle theory and that advocated by Gruber, Mehta and Vernon on the one hand, and by Keesing on the other. All these authors have found a strong correlation between the intensity of research of various American industries and the amount of their exports. This can be very well explained in terms of the product cycle theory which provides that the main exporting industries are those which constantly come up with new products and which replace them before they become standardized. But to continually launch new products requires a great deal of research and development. It must be noted that this theory as well as that of the product cycle were aimed at explaining the makeup of U.S. exports. Whether it can elucidate the makeup of Canadian exports and more particularly of the eight Quebec industries which we have selected, is what we shall examine.

Wilkinson (1), in his study of Canadian foreign trade, noted that Canada exports mostly raw materials and semi-processed goods and that its exports of manufactured goods are still quite limited. It is thus understandable that he found that Canadian exports are particularly raw material-intensive but he has also shown that research effort is a significant factor, especially in the case of exports of manufactured goods.

d) Financial policy:

Exportation may raise financial problems: it may be difficult to

(1) B.W. WILKINSON: Canada's International Trade: An Analysis of Recent Trends and patterns, Montreal, Private Planning Association of Canada, 1968.

collect; credits may have to be more long-term, etc... All these difficulties may force the exporting firm to maintain more liquidity than those selling to the domestic market. This is one of the questions we shall consider. In general, we shall attempt to determine the repercussions on the financial activities of the firm entailed by exports. To do this we shall compute seven financial ratios which will enable us to form an idea of the overall financial situation of the firm and to see whether there are significant differences between exporting and non-exporting firms as far as these seven ratios are concerned. These ratios can be divided into three categories:

a) 3 ratios indicate the liquidity of a firm; they are: the "quick ratio" (operating assets less the merchandise stock, divided by the operating liabilities), the turn-over rate of accounts receivable and the turn-over rate of stocks.

b) A financial structure ratio: this is the ratio between total liabilities and total assets.

c) Three ratios of profitability: first, the ratio between net sales and fixed assets, then the ratio between net profits and net worth; finally the ratio between net profit and net sales.

These ratios are used by many authors in financial studies and make it possible to cover all aspects of the financial situation. It would have been even more useful to follow up the development in time, unfortunately it was not possible to gather financial information for more than a few years. To avoid judging the financial situation of a firm on the basis of one year's operation, a year which may have been exceptional,

we established our ratios on three-year averages (1969, 1970 and 1971).

3. Factors characteristic for the entrepreneur:

One often hears that a small firms is identified with the person who founded and runs it, with the one whom we call the entrepreneur. This is true to the extent to which the manager can exercise personal influence on the course of the firm's activities because of the small number of employees or the limited scope of the operations. The one who decides, often by himself, on the direction which the firm will take, who established the policies and controls all operations, will also be the one to decide on this basic option; exportation. Which factors will enter into his decision? First there will be economic factors, profit considerations, but we believe subjective factors play a role as well, such as a personal interest in a foreign country, or travel in other countries, some taste for risk-taking, etc.... The question which arises then is the following: is there a well-defined type of entrepreneur more likely than another to launch his firm on the export business and, if so, which are his main characteristics? There are many elements which enable us to describe an entrepreneur; we believe there are six which are of particular importance, in the sense that they can have a direct influence on his propensity to agree to launch his firm on the adventure of exporting. They are:

1) His age.

2) His ethnic origin which is often associated with his mother tongue.

3) His educational level and field of interest: One might think that a well educated entrepreneur is more aware of the possibilities offered

by certain foreign markets for the sale of his products. He is also better able to assess the risks of the enterprise.

4) The kind of experience he has acquired before starting the firm. It is particularly important to know whether he has already worked abroad or with foreign countries and, if so, to what extent does this fact affect his decision to consider export sales.

5) The taste for risk-taking he exhibits. To export he must be able to take risks but also to know how to limit these risks.

6) His capacity to delegate authority and to accept the advice of his associates.

Regarding the entrepreneur, we have already emphasized the problem of a manager of a subsidiary wondering to what extent he could be considered an entrepreneur. Without actually tackling the question, we decided to consider entrepreneurs only those respondents who were either owners of firms, preferably founder-owners, or company presidents. We considered that the other respondents, vice-presidents or other employees did not have the necessary authority to determine firm policy and could therefore not be considered to be entrepreneurs.

V. ANALYSIS OF RESULTS

We noted earlier that we sent two series of questionnaires to the firms which made up our sample population: the first group of questionnaires was general, the second more specialized. To avoid repetitions, it seemed preferable rather than to present the results in sequence (one after the other) to regroup the data but noting the differences between the two groups when dealing with similar questions. On the whole, however, it can be said that the results of the two surveys were

satisfactorily matched. In addition to the survey results, our presentation of the results will include all comments or clarifications gleaned during the two series of interviews conducted with executives.

Before analyzing the results of the surveys in detail, it may be useful to find out to what extent the two samples on which we are going to establish our analysis are representative of the population to be studied. There are many factors on which this sample population comparison could be carried out: break-down of number of employees, amount of assets or sales volume per firm of the population and in the sample, amount of exports in one group and in the other, etc... The lack of data on the population makes most of these comparisons impossible. The only one we were able to carry out dealt with the break-down of the firms according to the eight industries selected. It may, however, not be the most important one. APPENDIX II shows this break-down of the firms. As far as the first sample collected from the first questionnaire is concerned, it shows that the composition is very similar to that of the population: only the "other chemical products" industry is somewhat underrepresented in the sample (18.1% of the firms) compared to the population (33.7%). On the other hand, the non-ferrous metal industry is slightly overrepresented. On the other hand, the differences in makeup are more apparent between the second sample and the population: the aircraft industry is obviously underrepresented in percentage but this is partly due to the small number of firms in this industry; the pharmaceutical industry is a little underrepresented. The oil and coal industry is obviously overrepresented: it seems that the reason for this is mainly due to discrepancies in definition; some firms classified

themselves in this industry while the Department of Trade and Commerce had ranked them with other industries. By and large it can be said that the samples obtained are a reasonable reflection of the composition of the population. A priori, there is thus no reason to believe that the results obtained from the samples could not be extended to all firms in the population.

A) The dependent variable: whether a firm does or does not export:

APPENDICES IIIa and IIIb, prepared from the results of the first questionnaire show that most of the firms in this sample do not export: 47 firms of 83 (56.6%) in fact sell only in Canada; 36 export (43.4%). The data of the second survey confirm these results: of the 146 firms which make up the sample, 79 or 54.1% do not export, 67 (45.9%) export. As the results of both surveys were very similar, we shall confine ourselves to a detailed analysis of the results of the first survey.

A glance at the two tables shows that the situation changes greatly from one industry to another. Thus, three industries export definitely more than the average: the aircraft, the non-ferrous metals and the non-electric machinery industries. On the other hand, three other industries hardly export at all: the other chemical products, the oil and coal and the pharmaceutical industries. However, before jumping to conclusions, it must be pointed out that there are only very few firms in some industries, which should make us beware when interpreting the percentages obtained. In fact the chi-square tests show that one cannot be sure that there is a significant difference between exporting

and non-exporting firms except in the case of two industries: the aircraft industry which exports a great deal and the other chemical products industry which essentially sells only in Canada. Where do the exporting firms export to? Essentially to the United States: of 36 firms which sell abroad, 34 or 94% sell to the United States and sometimes to other countries as well. These 34 firms represent 41% of all firms in the sample. 23 firms or 64% of the exporting firms sell to countries other than the United States: to Great Britain, Germany, Mexico, etc.. but sometimes to the United States as well.

Two questions could then be raised:

1) To what extent do the micro-economic results obtained in our sample reflect the true make-up of foreign trade in Quebec and Canada? To what extent do the micro-economic and macro-economic results coincide?

2) How can one explain the differences found between the industries? This is a very broad question (in fact is is the essence of the foreign trade theory) which far exceeds the scope of our study. We shall thus only touch upon it when we examine the explanatory variables and more specifically, the factors characteristic for the industries.

To revert to the first question, that of a comparison of the intensity of exports in our eight industries in both our sample and in the Quebec and Canadian statistics. In APPENDICES IV (a) and IV (b) we computed the export-production ratios for 17 industrial groups in both Canada and Quebec. Moreover, we determined the rank of each of these 17 industrial groups, in terms of amount of exports.

An analysis of our sample shows that three of the eight industries selected comprise clearly more exporting firms than the others, i.e.

the aeronautical industry, the non-ferrous metals industry and that of non-electric machinery. This does not necessarily mean that the percentage of their exports compared to their total sales is higher than for the other industries but it is nevertheless a good indicator. It was not possible to compute the export percentage for each industry because many firms refused to indicate the accurate amount of their exports. If we then analyze the data from Statistics Canada and of the Quebec Statistics Office we see that the aeronautical industry ranks third in exports among the 17 Quebec industries studied with an exports-sales percentage of 41.7% and 5th among the same industries at the national level with an export percentage of 35.8%. The non-ferrous raw metals industry ranks fourth (38.2%) in Quebec and first (64.5%) in Canada. Finally the non-electric machinery industry ranks 9th (7.6%) in Quebec and second (55.6%) in Canada. On the average these three industries export 29% of their production in Quebec and 51.9% of their production on a Canada-wide level. The average export percentage for the 17 industries under consideration is 17.29% for Quebec and 25.4% for Canada. It thus seems that the results of our sample agree with the Quebec and Canadian statistics as far as the three industries which export a great deal are concerned. On the other hand according to the results of our sample the following three industries: the industry of other chemical products, that of pharmaceutical products and of oil and coal definitely comprise fewer exporting firms than the others. According to government statistics the average export percentage for these three industries is 7.6% for Quebec (average for the 17 industries 17.29%) and 21.6% for Canada

(average 25.4% for the 17 industries), thus as a group they are definitely below the average. Appendices IV (a) and (b) shows that they are also below average on an individual basis. There is thus no doubt that the results obtained in our sample faithfully reflect the situation in province of Quebec as well as for Canada as a whole.

In conclusion, it must be noted that the eight industries selected have somewhat higher export percentage than manufacturing industries as a whole either in Quebec (18.56% for 8, compared to 17.29% for all 17) or in Canada (33.8% against 25.4%). We are now in a position to tackle the second question we posed earlier on the difference in export activities between industries which actually amounts to an examination of the explanatory variables for exportation in our model.

B. The explanatory variables:

I - Factors characteristic for the environment:

1) Factors characteristic for the industry:

a) General character of the industry and intensity of demand for industrial products:

We already noted that a firm which belongs to an industry with high exports is more likely to export than a similar firm in an industry which concentrates more on the domestic market. The question is now to find out why some other industries export a great deal while others export little. Without wanting to enter deeply into the international trade theory, one might say that according to classical theory exporting industries are those which have a "comparative advantage" over others. This amounts to saying that their relative costs, i.e. the ratio between their production costs and those of other industries is lower in their country than in other countries (importing countries). It remains to be determined why the relative costs of Canadian exporting industries are

lower than those of similar industries in the importing countries? Traditionally, this was explained in terms of availability of production factors; for example, countries which like Canada have immense natural resources can produce raw materials at very low cost which obviously benefits the industry which uses natural resources intensively. These industries will probably export. Modern theory is more dynamic and emphasizes mainly the development of the patrimony of production factors and the methods which allow improvements of these factors, such as research for example. Be that as it may, B.W. WILKINSON (1) in his article mentioned earlier, reached two conclusions which are of particular interest:

a) Canadian exports are essentially natural resources intensive. In 1965, about 35% of these exports consisted of raw materials which had practically not been processed and more generally 80% were "based on natural resources."

b) "The remaining 20% of exports were products of the secondary industry and dependent on the producers using comparable or superior technology than that used by foreign producers. (1) In the regression equation which he developed and whose dependent variable was the production percentage exported, the research effort in terms of the number of employees engaged in it, constituted a very significant factor. What consequences does this have for our study? Can one find common characteristics for the 8 industries which make up our population,

(1) B.W. WILKINSON: op. cit., p. 157. (French translation by the author).

besides the fact that these eight industries are the ones most intensively engaged in research in Canada? We shall come back in detail to the micro-economic aspect of the relationship between exports and research when we examine this independent variable. For the time being we shall deal only with the macro-economic aspect of this relationship in the industries. We had earlier noted that the average export percentage of the total sales of the eight industries selected was slightly higher than the average percentage for all manufacturing industries; this phenomenon also applies to the basic industries in Quebec as well as for Canadian industry as a whole. However, it must be noted that the relatively high average of the eight industries conceals considerable disparities: thus in Quebec the export percentage ranges from 41.7% for aircraft and parts and 38.2% for non-ferrous metals to 0.3% for the rubber and oil industries; the phenomenon is the same for Canada as a whole: the average of 33.8% disguises the extremes: 64.5% of exports for non-ferrous metals and 55.6% for machinery; 6.3% for pharmaceutical products and 4.0% for rubber. This shows that among the industries most heavily engaged in research some export very little.

Another fact supports the idea that there is not necessarily a relationship between research and exportation. In columns (3), (4), and (5) of APPENDICES IV (a) and IV (b) we have ranked all 17 industries, once in order of diminishing percentages of their exports compared to their sales, and then according to the diminishing order of their research effort. The correlation coefficient (Spearman rank correlation coefficient) between these two series of listings is

practically zero (r_1= 0.088) for Canadian industry; it is even slightly negative (r_2= -0.110) for Quebec industries. In fact, contrary to WILKINSON, but in accordance with some other non-published studies, we have not found any significant relationship between the intensity of research and export intensity for industry as a whole. We note that our conclusions are not totally contrary to those of WILKINSON: in fact, if the same operation is repeated (ranking by decreasing order of export intensity on the one hand and research on the other) but only for the 8 research-intensive industries, the correlation coefficient between these two categories is 0.620, that is high enough to assert that there is a relationship between the two factors under consideration (APPENDIX V). How can one reconcile these two apparently contradictory results? WILKINSON furnishes us with an answer: an analysis of industry as a whole shows that those that export the most are the primary industries and those which semi-process raw materials; these industries do little research on the whole, hence the low correlation coefficients. On the other hand, if the study is confined to secondary industry, one finds a relationship between research and exports.

Can one discover other relationships, always on the macro-economic level, which would explain the differences in export intensity between the 8 industries under consideration? To do this we used the same concepts in APPENDIX V as WILKINSON did, that is we divided the industries into four categories:

1) Natural resource-intensive industries: the proportion of their raw material costs of overall costs is higher than the average for the entire

manufacturing industry;

2) Human capital-intensive industries: their salaries per employee are higher than the average;

3) Non-skilled labour-intensive industries: salaries per employee are lower than the average;

4) Physical capital-intensive industries: non-salary value added per employee is higher than the average.

In fact our 8 industries are nearly evenly divided into these categories: the aeronautical and electrical equipment industry in the human capital-intensive category; the rubber, machinery, pharmaceutical products and chemical products industries in the physical capital-intensive category, finally non-ferrous metal and oil are natural resources-intensive. Thus it is not possible to establish an obvious relationship with export intensity.

To consider more practical aspects, the export phenomenon is sometimes explained through the play of production and demand, both domestic and foreign demand; in fact, according to theory a country only exports its excess production, that which is not consumed domestically. It would take too long to evaluate the demand (with regard to production) in each of these industries but we shall deal briefly with the three main exporting industries. The aeronautical industry ranks first; it also ranks first regarding research expenditures compared to sales. To be able to amortize these expenditures, or if one prefers, in order not to unduly inflate the total costs, they must be spread over a considerable production volume. The Canadian market is rather limited and this industry therefore depends to a very large extent on exports to survive

and grow. The non-ferrous metals industry ranks second in export intensity, and 5th in research intensity. It is an industry both intensive in natural resources and in physical capital. To understand the position well, it must be noted that Canada is one of the principal producers of non-ferrous metals in the world: it ranks first for nickel (58.5% of the 1963 world production), second for zinc (13.1% of world production) and 5th for copper and lead. Although the domestic market is growing rapidly, it is inadequate to absorb the enormous production which must thus depend on foreign demand. Far behind these two exporting industries in third place is the chemical industry. It only exports quite a small proportion of its production (14%), on the other hand itw imports nearly 20% of the conspicuous Canadian consumption. The Canadian chemical industry being quite specialized manufactures and exports some groups of products (fertilizers, industrial chemical products, explosives) for which Canadian demand is small; it thus depends to a certain extent on foreign demand. The five remaining industries export relatively little.

In this connection it should be noted that during the second survey we determined that 68 of the 146 respondents (or 46%) exported and 78 sold only in Canada. Of the 68 exporting firms 26 (38%) stated that the Canadian market was not large enough for their products to absorbe their entire production. This means that the size of the Canadian market (domestic demand) and foreign demand influence the decision to export. Incidentally, APPENDIX VI contains the tables listing the other explanatory variables.

b) The competition:

Competition may come from domestic firms or from foreign firms and while both forms of competition affect the Canadian firm equally, they may have different consequences as far as the export decision is concerned. Tables A-1 and A-2 deal with domestic competition, while Table A-3 concerns foreign competition. As far as competition from Canadian firms is concerned, nearly all respondents agree that it is strong or very strong: 72 of 83 firms, or nearly 87%. Under these circumstances, it is easy to understand that the chi-square tests on independent variables show no significant differences as far as exports are concerned between firms which face stiff, medium or little competition. There are too few firms in the categories of medium and weak competition to rely on the percentages indicated. To clarify the question somewhat we investigated whether domestic competition stemmed mainly from large or small firms and whether the size of the competing firms affected the distribution of exporting firms. Table A-2 shows that the majority of competing firms (55 respondents of 82, or 67%) are large firms. It also shows that the size of competing firms does not seem to affect the distribution of exporting firms. Foreign competition (Table A-3) on the other hand, seems clearly weaker than domestic competition: only 33 of 82 respondents (40%) qualify it as stiff, 19 (23.5%) as medium and 30 (36.5%) consider it weak. It is among those which consider foreign competition medium that we find the highest proportion of exporting firms but the tests show that the differences between the three categories are not significant.

2) Incentive factors for export.

The Government of Canada, as those of most other countries, endeavors to promote exports by offering a variety of services and incentives to firms already engaged in the export business and to those planning to engage in it. For instance, it offers: a foreign market information service; in some cases it can find, through the commercial attachés stationed at Canadian Embassies in most capitals in the world, foreign customers for Canadian products; also, it organizes conferences, visits abroad, etc. The government has even created the Export Development Company, which assumes most of the risks incurred by Canadian exporters and by so doing facilitates bank credits for exporters, etc. The Government of Quebec also provides a range of services to exporters with particular emphasis on information and research services. Is there a relationship between the awareness of these incentives and exportation?

Table A-4, A-6 and A-1 prove this beyond a shadow of a doubt. Thus, when there is awareness of the services provided by the Federal Government the chi-square tests show a significant difference in conduct ($X^2 = 10.005$ with two degrees of freedom: significant at a confidence level of 0.01) as far as export is concerned between firms familiar with these services and those which are not. Among the 141 respondents 101 were aware of the existence of these programs, i.e. about 72%. If we now separate the exporting from the non-exporting companies we find the percentage within the exporting group familiar with the Federal Government export assistance to be 85%, and 60% in the others. It must be noted that knowledge of Federal services and incentives to exporters does not

necessarily represent an important factor in the decision to export. The cause-effect relationship may be reversed, since it is likely that the exporting companies investigate all available sources of assistance, particularly information on their target-markets. The same phenomenon is noted with regard to services provided by the Provincial Government (Table A-6) and by the Export Development Corporation (Table A-7) except that the percentage of firms aware of these services was much lower: 52.2% for provincial services and 55.8% for those offered by the Export Development Corporation.

At first glance, Table A-5 is quite difficult to interpret. It shows that, while most firms are familiar with Federal and Provincial subsidies for exports, only a minority makes use of them: 16 of 42 respondents (38.1%) had actually used the federal services and only 11 of 39 (28.2%) had taken advantage of provincial services. Although the distribution of companies among the 4 categories is reminiscent of Tables A-4, A-6 and A-7, the chi-square tests show clearly that there is no significant difference, as far as exports are concerned, between those which use export assistance services and those which do not. Thus, it is not the fact of using these services which is important but rather the awareness of them and this reflects the degree of a firm's dynamism. Two facts corroborate this interpretation:

a) Both the Federal and the Quebec Governments provide assistance programs, either for small firms (e.g. the programs of the Department of Regional Economic Expansion) or for technical firms (IRDIA program). Thus, Table A-8 proves conclusively the existence of a link between the utilization of these programs (not at all geared towards exports)

and exportation. In most cases the firms that apply for assistance are also those engaging in exports, such firms being the most dynamic ones. Table A-9 goes even farther, because it shows that 50% of the exporting firms (16 of 32) have applied for assistance to both the Federal and the Quebec Governments, while only 2 of the non-exporting companies (7.4%) have made such applications at both government levels, with the remaining 92.6% applying only to one government. According to the tests, there is no significant difference regarding exports between firms which received the assistance requested and those which did not, for the very good reason that assistance was granted in almost every case.

b) In a previous study we have shown "that large firms submit proportionally more applications for assistance than small ones." (1) And, as we shall see later, the large firms are also those which export most. Large firms are better organized and familiar with all assistance possibilities whether they be export subsidies, government development subsidies or technical assistance, etc. They can in fact afford to have departments specializing in exports or in the procurement of subsidies. They are thus up to date with regard to services provided by government to exporters or to firms looking for markets, although usually they do not turn to them, because they often have their own expert staff for export matters. On the other hand, the small firm,

(1) Gérard Garnier and Jean Robidoux: "Facteurs de succes de faiblesses des petites et moyennes entreprises manufacturieres au Québec, spécialment des entreprises utilisant des techniques de production avancées." (Success factors and shortcomings of small and medium manufacturing firms in Quebec, with special emphasis on those using advanced production techniques). p. 105 and APPENDIX XII, study carried out for the Federal Department of Trade and Commerce, December 1973.

which actually is in greater need of help, is more often than not unaware of the available services provided by governments in their field.

In conclusion, it is quite apparent that large firms are more aware of export subsidies and tend to be at the same time the largest exporters, which explains the relationship we established between these two factors.

II. Factors characteristic of the firm.

Hitherto we have dealt mostly with the macro-economic aspect of foreign trade with emphasis on the influence of the environment. We shall now deal with the micro-economic aspects specifically related to the characteristics of the firm. These characteristics can be divided into two groups: the physical characteristics and the guide-lines of managers, or what is called their philosophy.

1. The physical characteristics of the firm.

a) the age of corporations:

The age of the corporation seems to be linked to export process. Table B-1 shows the largest proportion of exporting companies among the newest ones, probably because the youngest companies are also the most dynamic ones.

b) size of the firm.

We have indicated earlier that there exists a relationship between size and export (volume). We have also indicated the various ways of measuring the size of a company: by the number of employees, by the amount of their sales volume or by total assets. Tables B-2 (a),

B-3 and B-4 show that the number of employees is the best indicator for the export-size ratio. From these three tables we learn that there is a greater proportion of exporting companies among the largest than among the medium and small firms. However, the size-export relationship is truly significant in statistical terms only by the number of employees working for the firms in our sample in 1973. It should be noted that we have found exactly the same results in both surveys. We shall see later that other size variables (the amount of profit, for instance) confirm the size-export relationship. There is no question that the exporting companies are mainly large corporations: many small companies are not geared for export and they shy away from the difficulties involved in it.

An interesting fact to be noted is that if in Table B-2 (a) the export variable in its binary form (exporting-non-exporting) is replaced by the percentage of foreign sales in relation to total sales of the company (Table B-2 (b)) while keeping the other variable (number of employees), the relationship is no longer significant. This phenomenon can be explained in many ways: first the analysis refers only to 27 instead of 139 companies, which results in a very limited number of companies in some areas. As a consequence it is practically impossible to obtain a significant chi-square test. Another reason relates to the poor quality of all numerical data supplied by the respondents. Finally, a last reason may be that the relationship between export figures and size is not linear, that the foreign sales figure is not proportional to the size of the company. It is impossible,

given the small number of firms which provided their exportation figures, to determine what the real situation is. Incidentally, it should be noted that for most firms, export represents only a marginal activity; for 18 of the 29 firms, exports account for less than 1% of their business volume; 6 among them export between 1% and 50% of their output; and finally for five companies exports represent more than half of their sales volume. This includes one firm which exports all of its output.

c) Number of customers: concentration or diversification:

The number of customers to whom a company sells could be considered the result of a policy chosen by management to concentrate, or, conversely, to diversify its sales outlets. In actual fact, the number of customers is at least as often the result of random events as it is the result of deliberate decisions. At a given moment, a company has a certain number of customers it cannot alter except over a protracted period. In the short term, this is a characteristic of the firm.

Table B-5 shows that the vast majority of companies has more than 50 customers. Actually, only 10 companies (12%) among 83 respondents have fewer than 50 customers. Due to the very limited number of companies with less than 50 customers one cannot rely too much on their division into exporting and non-exporting companies and it would thus seem logical that statistical studies do not show a significant relationship between the two factors. The number of customers can hardly be considered indicative of the level of concentration of sales of a company. It was thus decided to study the problem more thoroughly by establishing

whether there was a relationship between exportation and the percentage of the company's sales volume with their 3 biggest customers on the one hand (Table B-6), and with their largest client on the other (Table B-7). In both cases the response was negative: we defined 3 levels of concentration but the proportion of exporting companies was virtually the same in all of them.

The situation is similar for foreign customers, although the number of foreign customers is generally lower: of the 39 companies which furnished data in this field, 15 (38%) have less than 10 foreign customers, 14 have between 10 and 50, while 10 have 50 or more. The foreign customers are mostly Americans. The other customers mentioned are Europeans (mainly English, French or German) or Asian.

d) Legal status of the firm: subsidiary or independent company.

We have already stressed the importance of the distinction between subsidiaries and independent companies in our macro-economic analysis of export factors. We have emphasized in particular that reports of the Federal Department of Trade and Commerce on Canadian Subsidiaries of Foreign Companies indicate that these subsidiaries export more than strictly Canadian companies. How does this apply at the micro-economic level, particularly in regard to our sample? First of all, it must be noted that subsidiaries constitute about 35% of our sample, since there are 50 in a sample of 144 firms. Our study has not permitted us to determine whether export volume by firm is higher for subsidiaries than for independent companies. On the other hand, Table B-8 shows that 54% of subsidiaries polled engage in export,

compared to only 42.6% for the independent firms. However, the difference between the two percentages is insufficient to ensure that it is not purely accidental and the chi-square tests are thus negative. Table B-9 is essentially the same as B-8, but provides more information about the countries to which the firms in our sample export. It should be mentioned that subsidiaries tend to export relatively more to the U.S. than the others: among the 27 subsidiaries which export, 24, i.e. 89% sell to the U.S.; 33 out of 40 independent exporting companies (83%) sell to that country. On the other hand, there is a larger proportion of independent companies (25%) that sell to countries other than the U.S. than subsidiaries (14%), probably because the parent-companies of most subsidiaries are American. The tables may provide a clearer picture of this relationship.

We have been unable to obtain more convincing results in our analysis of Table B-8, partly because we included in the category of subsidiaries, not only subsidiaries of foreign companies, but also those of Canadian firms. Table B-10 compares the conduct of Canadian subsidiaries to foreign subsidiaries with regard to export. The chi-square test indicates a significant difference in attitude between the two types of subsidiaries: only a third of Canadian subsidiaries are engaged in export, which represents a lower percentage than for independent companies. On the other hand, foreign subsidiaries include a much larger proportion of exporting companies and, paradoxically, it is the group of subsidiaries whose headquarters are located in countries other than the U.S. which show the highest percentage. There is thus a clear distinction - regarding exports - between Canadian companies

(independent or subsidiaries) and subsidiaries of foreign corporations.

Table B-11 specifies the data obtained in Table B-10 by emphasizing the relationship between the country of origin of the parent-company and the countries to which the Quebec subsidiary sells its products. As mentioned earlier, the majority of subsidiaries of Canadian companies sell their product only in Canada, but 28.5% sell also to the U.S., with 4.8% (one company) selling to foreign countries other than the U.S. The majority of subsidiaries of foreign firms export abroad; most of them, of course, sell to the U.S. Incidentally, it is interesting to note that the largest proportion of exporting companies and of firms serving the U.S. market is found among the subsidiaries of non-American firms (66.7%). Moreover, 22% of them sell to other foreign countries, while only one of 12 exporting subsidiaries of American firms does so. It is obvious, then, that subsidiaries of foreign companies export more than the others. Two questions must thus be answered:

a) Do they really export in the sense of the theory of international trade or do they sell more or less unprocessed goods to their parent-company which then turns them into technically more advanced finished goods?

b) Why do subsidiaries of foreign firms export more?

a) Table B-12 attempts to answer the first question. Of 53 firms which replied to this question, 38 or close to 72% do not sell to their parent company at all; of 23 Canadian subsidiaries, 22 or 95.6% do not sell to their parent company; on the other hand, only 12 subsidiaries of 21 U.S. firms (i.e. 57%) do not sell to their parent company just as only four foreign subsidiaries out of 9 (44.4%) do not sell to their parent company. Overall sales to parent companies represent only a

rather small proportion of the total sales of subsidiaries: for 7 out of 15 it represents 5% of their sales at most. However, one company sells 25% of its production, another 40% and a third 60% but these are exceptions among the small firms. Furthermore, it appears that subsidiaries of foreign non-American firms are the ones which sell the most within their own global firms. In conclusion, it should be mentioned that the chi-square test shows a significant relationship between the two variables under investigation, i.e. the percentage of production sold to the parent company and the nationality of the parent company.

b) The answer to the second question is simple and entirely in line with what we have previously indicated. The subsidiaries, particularly those of foreign corporations, export more because they are generally larger than their independent competitors; thus we have shown that most exporting firms are among the large corporations. Tables B-13 and B-14 indicate that the relationship is significant whether size is measured by the number of employees (Table B-13) or the sales volume in 1973 (Table B-14).

2. Guiding principles of management - its "philosophy."

Under the heading of philosophy we shall list two categories of data:

a) management approach to planning.

b) master policies concerning the vital functions of the company.

a) General Management and Planning:

Exportation is a complex activity requiring a very detailed organization and considerable planning skill, but planning has always been the

weak point of small and large firms. It is very interesting - under these conditions - to study the links that may tie the export process to that of planning in the three principal operations of a company, namely, finance, marketing and production and to find out whether exporting companies do more planning than others. It must be noted at the outset that Tables B-15, B-16 and B-17 show that there is no significant relationship - in statistical terms - between the two processes and that this lack applies to the 3 functions. It is surprising to find that between 17 and 19 companies - depending on the function - of 83 (i.e. between 20% and 23%) claim not to use any planning system: this is quite a high number. Regarding the three functions it is among the non-exporting companies that one finds the greatest number which do not do any planning, but there again, since the relationship is not significant this effect may be purely accidental. It is understandable that the export-planning relationship would not be significant, if one considers that the non-exporting companies are the ones doing the most short-term planning (one year or less) and even long-term planning (more than one year). It should be mentioned in passing, that the largest number of companies do their long-term planning in marketing and the lowest number do so for production. Finally, although there is a higher proportion of companies with either a short or a long-term planning system among the exporting companies (89% in finance, 83% in marketing and 89% in production) the difference in percentage is insufficient to claim a causal relationship between the two processes.

b) Marketing and Production policy:

When we introduced our model, we mentioned the broad outlines of the production cycle theory which links the exporting activity of the company to the stage of development of its principal products. We have stressed then that according to this theory, a company starts to export shortly after introducing a "new product" into the domestic market, but the export volume at that time is very limited. As the domestic and foreign markets develop, the demand increases, production keeps pace and most production costs drop. This is the stage of the "maturing product." At this point a company's exports are at their peak. Next, the product will be mass-produced: it becomes a "standardized product" with cost as its main sales point. However, since production costs - labour in particular - are usually lower abroad than in North America and with foreign demand rising briskly it becomes more advantageous to produce abroad rather than to export. Hence exports will drop.

It should not be forgotten, however, that we have selected eight technically advanced industries and that technology develops very quickly. Consequently, it is logical to expect to find a relationship between the export volume of a given company and the range of new products it offers its customers. It is surprising to note that according to the data in Table B-18, 48 of 146 companies, or almost a third of the sample, have not introduced any new product in the last five years (1969-1974). On the other hand, 13 companies have put 50 or more new products on the market in this period (18 companies have introduced approximately 100 new items). One finds a far greater proportion of

non-exporting companies than others among those which have not updated their production range at all. However, among those which introduced many new products, the proportion of exporting and non-exporting companies is virtually the same. Finally, the statistical tests show no significant relationship.

As mentioned earlier, technology advances very rapidly and some authors believe it is not enough for a company to inprove its products slightly in order to continue its growth and exports; it must also be capable to embark, from time to time, on entirely new fields, to add new product lines or even to switch fields entirely. We attempted to verify this hypothesis by polling the companies on whether they had added entirely new products to their line or whether they had embarked on new activities during the last five years. Table B-19 indicates that 40% of the companies replied in the affirmative, but this diversification did not seem related to exports.

We attempted to determine further, whether the exporting companies had a higher process ratio for their new products than the non-exporting companies. There again, we find a slight difference, but not a significant one. We also examined the relationship between exports and the type of manufacturing product: consumer goods or producer goods. Table B-20 shows that most companies in our sample manufacture and sell producer goods: this is the case for 77 of 134 respondents (i.e. 57.5%), but this is related to the type of industries we selected. On the other hand, the type of manufactured goods has no significant influence on exports, although one finds a far greater proportion of exporting companies among those engaged in the manufacture of industrial products

and a higher proportion of non-exporting companies among those producing consumer goods. But, once again, the statistical tests show no significant difference regarding exports ~~exists~~ between the companies which manufacture standardized goods and those concentrating on custom-made products (Table B-21). The difference, most likely, is due to the type of industry to which they belong. It should be mentioned, however, that 38% of the companies (54 of 141) manufacture both kinds of products.

To conclude with the product cycle theory, we must say a few words regarding the changing effect of price throughout the cycle. At the outset, that is at the time when the product is being introduced in small series its price is high. However, what affects the sale are the technical qualities: the price actually does not matter, since the new product is quite different and is not challenged by direct competition. Later, however, when the product is mass produced, the price becomes increasingly more important. It is on the basis of the rise in production costs in the country of origin, reflected in the price, that the company will have to decide when to stop exporting to foreign markets and to manufacture abroad.

It was not possible to verify the consequences of the product cycle theory directly. We had to confine ourselves to polling of the respondent companies (all exporters) as to whether the FOB price of their products in foreign markets was higher or lower than that of their foreign competitors. This is a very general question, since the situation may vary from one foreign market to the other for the same product. Of the 65 respondents 4 claimed their prices were lower, 50 stated that their prices were about the same as the foreign ones and, finally, eleven said their prices were higher. For the majority of

those questioned, import tariffs levied by the importing countries were a very important factor in determing the eventual sale price: 35 of 73 respondent companies claimed that tariffs substantially increased the price of their product abroad.

In conclusion, we found no indicator in the characteristics of products, particularly of new ones, manufactured and sold by companies of our sample, to enable us to detect exporting companies in advance. This does not mean, that all theories which explain the export phenomenon in terms of characteristics of products sold are false, but only that the question must be approached differently and that new methods must be found to verify these theories empirically.

c) Research and development policy.

Earlier, we examined the relationship existing on the macro-economic level, that is to say on the level of entire industries, between the export process and the intensity of research carried out by the industry. We then found out that if one classifies all Canadian industries (including Quebec) according to the intensity of their research and then on the basis of the percentage of their exports in relation to production, the correlation coefficient between the two classifications is practically zero. We explained this phenomenon by establishing that the main exporting industries in Canada are primary industries which confine themselves to extracting raw materials and semi-processing them, and exporting them as semi-finished products. These primary industries as a whole do very little research. The same observation applies to the exporting industries in Quebec. Conversely, if one considers only

the eight research-intensive industries which make up our population, the correlation coefficient between the rank in exports, on the one hand, and research on the other, is far higher and quite significant. It appears that the majority of these eight industries belong to the secondary sector (not the primary one), the only sector for which the relationship between research and exports discovered by Vernon, Gruber and Mehta, seems actually valid in Canada. What about the micro-economic level, i.e. on the level of the firms in our sample? Is the research-export relationship as valid for small companies as it is for the large ones?

The simplest way - to begin with - would have been to enquire whether the companies regarded themselves as "technological" or not and to determine whether there was a significant difference with regard to exports between the two categories. This is what we did: the results are presented in Table B-22. It must be pointed out at the outset that 80 of 144 respondents (i.e. 55.6% of the total) did not consider themselves "technological" which is a relatively high proportion. We knew, and these figures confirm it, that the small companies do relatively little research even in the fields considered highly technical. Next, it should be mentioned that the statistic tests reveal a clearly significant relationship between the technical character of the company and the export process: 65% of the self-declared "technological" companies export as against only 31% in the case of "non-technological" firms. Admittedly, the manner in which the technological character of a firm was determined is rather imprecise,

although it could be claimed that the managers of the firms are best able to know whether a company is technological or not. This interpretation nonetheless is rather subjective and the term "technical" or "technological" may be interpreted differently by different executives. Traditionally, the term "technological" is linked to the word "research" and one determines whether an industry or a company is "technological" or not, according to its research efforts. Thus we have asked the companies whether they carried out in-house (intramural) research to determine whether there were differences as far as exports are concerned, among those who do research and those who do not. The results of Table B-23 show clearly that there is little difference between the two categories: moreover, one finds a higher proportion of non-exporting companies among those not engaged in research. Be that as it may, the statistical tests indicate that there is no significant difference.

It is interesting to get to know the kind of research engaged in by these companies. We have established 3 levels of research implying a gradually more intensive involvement in research by the company. At the first level there is research aimed at simply improving current products; at the next level research to design and develop new products or manufacturing methods; finally, at the highest level, the, so-called, basic research, which is not focused on immediate profits, but is concerned with more theoretical problems. Table B-24 shows the results: as was to be expected, nearly all companies classify themselves in the first two categories (companies in the last column headed "several" have all placed themselves in the two first categories under which they can

thus be classified); only 6 companies of 106 are engaged in basic research. There is no significant difference between exporting and non-exporting companies.

The importance of the research effort carried out by a company can be assessed in several ways: the two main approaches consist of first counting the scientists and technicians engaged in research and secondly, by determining the funds allotted to the research budgets. Unfortunately, the two methods do not always yield identical results. Table B-25 shows the relationship between exports and the number of scientific or technical staff engaged full time in research. The average, to be sure, for the 51 companies which supplied data on the numbers of their research staff is two employees. 40 of the 51 companies employ at the most 3 people in research work. Only 7 companies have a research team of 10 or more employees. It was found that in 3 categories we defined, the majority of firms export, and it is among the exporting companies (76.5%) that the largest proportion of research workers are employed. It should be made clear, however, that the size of the research staff may simply be an indication of the size of the company. Size being related to the export factor, it is easy to see, that the firms with the largest research staff are among those most active in exports. In any case, the relationship between exports and the size of the research staff is statistically not significant. The other method of assessing the intensity of the research effort is by the size of the budget earmarked for this activity. Between 1961 and 1973, the average research budget, according to the figures provided by the companies, has grown about sevenfold. It rose from an average of $3.700 - (but only 21 companies responded) to $4.587 -

(26 companies) in 1964 to $7.667 - (37 companies) in 1967 to $15.873 - (46 companies) in 1970 and finally to an average of $25.373 - (66 responding companies). However, during the same period of time (1961-1973) the average business volume/per company, multiplied approximately by 18, rising from $99.420 - to $1.792.893 -. In conclusion, the average research budget in terms of percentage of average sales, has thus dropped considerably, from 3.7% of sales in 1961 to 3.0% in 1964 - to 1.96% in 1967 to 2.30% in 1970, reaching finally 1.42% of sales in 1973.

Table B-26 shows the relationship between exports and research budget for the year 1973. As can be seen, the relationship is significant in statistical terms; however, the amount allotted for research expenditures should be considered mostly as an indication of a company's size, which in turn is closely related to exports. To eliminate the influence of the size of a firm, we substituted for the amount of research expenditures the proportion of these expenditures of total sales (for 1973) in establishing their relationship to exports: Table B-27. Thus we find that relationship is no longer significant. We have divided the sample in three groups, according to the percentage of sales allotted to research. The only group where there was a majority of exporting companies was the middle group, in which the companies spend between 0.5% and 2.5% of their sales for research. Strange as this may seem, the group most heavily engaged in research - 70% of the companies - does not export.

In conclusion, their seems to be no clear and linear relationship between exports and research expenditures.

Hitherto we have linked the degree of technology of a company or industry to the size of its research effort. However, the term research can be quite imprecise, since there are other ways to gain access to modern technology than by doing in-house research. It can be obtained through other organizations engaged in research, be it the parent company, in the case of subsidiaries or through outside consultants; one can also resort to manufacturing franchises. Regarding subsidiaries, it is an open question whether they receive their technical knowledge, their "technology" from the same sources as the independent companies; one can inquire too whether there is any relationship between the source of technical know-how and whether a firm does or does not export.

Table B-28 compares the various sources of technical know-how employed by subsidiaries on the one hand, and independent companies on the other. It should be noted, that from a statistical point of view, the relationships are highly significant; there is no doubt that subsidiaries as well as independents avail themselves generally of different sources. For 50% respondent subsidiaries (i.e. 51 companies) the only source of technical know-how is the parent company; furthermore, 23.5% of subsidiaries do in-house research, while also using the services of the parent company: in-house research confined to the company ranks third in order of importance: only about 14% of subsidiaries utilize it as their sole source of knowledge. Manufacturing franchises and outside consultants are only used by a minority of companies. As far as independent companies are concerned, technical know-how is provided by widely different sources. In 55% of cases, the principal source is in-house research; in second place are outside consultants (universities,

governments, independent laboratories) used by 30% of respondents: finally, the third source is represented by manufacturing franchises used by 11.3% of the independents. Is the use of these various sources in any way linked to exportation? Table B-29 shows no significant differences with regard to exports between the utilization of one technological source rather than another. We have previously shown that firms which do in-house research do not export more than others (Table B-23). In conclusion, we note, that we have found no significant differences between subsidiaries and independents regarding the number of people engaged in research or the amounts earmarked for that purpose.

Finally, what can be concluded from these statistics? There is no doubt, that "technological" companies (or those which consider themselves as such) export more than others. The problem is to know how to measure the degree of technology: it seems that most of the factors used for this purpose do not yield satisfactory results, although the amount earmarked for research is quite a good indicator. There seems to be no significant relationship between most of these factors (except perhaps the amount of research expenditures) and the fact that a firm does or does not export.

In conclusion, it should be noted, that subsidiaries and independent companies do not obtain their technical know-how from the same sources, but this seems to have no bearing on their export performance.

d) Financial Policy.

Later on, we will see, that exportation presents very special problems to the exporting company and that some of the problems are

financial in nature. In other words, exportation may affect the financial operations of the company mainly in three different ways:

1) The exporting company may be inclined to grant longer term credits to their foreign customers than to their domestic ones and may have greater difficulties to collect. All this may affect the liquidity of the company.

2) The company itself may need larger credits to enable it to extend to foreign customers relatively long-term financing. This may increase its short and long-term debts and thus alter its financial structure.

3) In principle, a company will not export unless it obtains a higher net profit on its foreign sales than on its domestic ones. It can thus be expected that exports alter the profitability of a company generally by improving it. In order to study these financial results, we shall use three groups of financial ratios, later to be dealt with in detail.

1) The influence of exports on a company's liquidity.

When we talk about liquidity, we think immediately in terms of operating assets and liabilities, as well as of a certain number of ratios.

We have discovered no relationship between exports and a company's operating liabilities; on the other hand the relationship to operating assets (1971) is significant as indicated in Table B-30. Exporting companies have usually larger operating assets than others. However, one should not attach too much importance to this phenomenon, since the amount of operating assets most likely reflects the size of the company, which in turn is closely linked to exports. To keep this phenomenon in

perspective it is preferable to judge by ratios.

We have selected three ratios to measure the liquidity of the company, or more specifically, several aspects of its liquidity. These are:

a) the "quick ratio," i.e. the ratio between operating assets less plant and operating liabilities. The numerator only takes into account the liquid cash at hand, negotiables and accounts receivable. These are actually the most liquid items on the balance sheet. One usually expects this ratio to be higher than 1; however, it is difficult to attach a priori value to it, because it has no real significance, except by comparison with the mean ratio of the industry.

b) the turn-over rate of the accounts receivable obtained by dividing the amount of sales on credit for the year by the annual average of accounts receivable. Because of lack of information, we assumed that all sales made were on credit and we have taken the value of accounts receivable as indicated in the year-end balance sheet. We can transform this ratio to obtain the average period for collecting the accounts receivable, by taking the inverse of the rate of turn-over and multiplying it by 365. There again a firm's turn-over rate is valid only in relation to the industry rate, which reflects normal credit conditions for the firms within that industry.

c) The turn-over rate of stock can be calculated by dividing the amount of annual sales by the mean value of inventory during the year. Here too, we used the year-end value. This ratio indicates the liquidity of the inventory. In order not to have these ratios reflect only the

particular conditions of a given year - a year that may not be typical - we used the mean ratios of a 3-year period, i.e. 1969, 1970 and 1971. It would have been interesting to follow up the ratios further, but for lack of statistical data we were unable to do so.

To be sure, none of the 3 ratios seem linked in any significant way to exports.

a) Table B-31 shows the relationship between exports and the "quick ratio." Most of the respondents had a ratio higher than one; some even have very high ratios, in the order of 8 to 9, indicating a very high liquidity. In accordance with the results obtained in Table B-30 on the relationship between export and amount of operating assets, it could be expected that exporting companies show a higher ratio than others. Actually this is not so: most non-exporting companies have "quick ratios" higher than 2; most of the exporting firms show ratios below 2. However, the tests show no significant relationship.

b) In Table B-32 we analyzed the relationship between exports and stock turn-over. In 1971, the average of these was 6.9 for 84 companies supplying such data; 38 of these companies had a rate below 5; 18 had a turn-over rate equal to or higher than 10. Although we find a larger proportion of exporting than non-exporting companies among those with higher ratios, tests show no statistically significant relationship.

c) Finally, Table B-33 examines the relationship between exports and collection period for accounts receivable. As is to be expected, exporting companies show longer collection periods, but in general the relationship is not significant.

2. Influence of financial structure

One of the financial problems mentioned most often in regard to small companies, is that of insufficient capital, especially at the outset. Many entrepreneurs start in business with very limited funds and count on various types of loans to provide the funds required to launch and operate their companies. This is a very dangerous policy and not only because it imposes on the fledgling company a heavy fixed burden in the form of interest payments. Many companies are unable to survive under it. On the other hand, a financial structure too heavily in debt does not inspire the confidence of loan institutions: the entrepreneur thus takes on a heavy mortgage for the future, which may prevent him from obtaining the funds necessary for the future development of his company. Now, does the financial structure have an impact on exports? It may, if the company requires credits to enable it to export.

We have evaluated the financial structure in two ways: on the one hand, by determining the owners net worth in each company in 1971, on the other, by calculating the ratio: total debt over total liabilities (or total assets, which amounts to the same). We have subsequently compared these two factors with the export variable.

a) Table B-34 analyzes the relationship of exports to owner's net worth. Earlier, we noted that in 1971, the owner's average net worth amounted to $675.238 - for the 84 respondent companies. This represented 22.8% of the average total liabilities, which on the average amounted to $2,962.667 - By the same token, this means that the total debt amounted to an average of $2,300.000 -, i.e. 77.2% of the average total liabilities.

This debt can in turn be divided into: operating liabilities (short-term debt) then estimated at an average of $460.000.- for the 84 companies and long-term debts, i.e. of over one year estimated at an average of $1,870.000.-. In percentages this means, that short-term debts represented an average of 15.5% of total liabilities and consequently long-term debts representing 61.7% of these liabilities. Along similar lines, it should be mentioned, that in 3 years (1969-1971) the owner's average net worth rose by 33.7%, while average total liabilities rose by 226.6%. Returning to Table B-23, no relationship can be found between the amount of the owner's net worth and exportation: the tests confirm the non-existence of any relationship.

b) Table B-35 confirms the previous conclusions. It is surprising to find that of the 84 respondents, 25 have a ratio of total debts to total liabilities of over 90%; for some the ratio is close to 100%. This means, that the owner has practically no investment in his firm. However, no difference was noted between companies with low debt percentages and those with high percentages as far as exports are concerned.

3) Influence on the profitability of the firm.

Profitability is one of the most popular indicators used for assessing the success of a company. However, it has certain shortcomings and therefore other criteria are used as well. We shall return to this point in greater detail at a later stage in this report.

In 1971, net profits after taxes rose by an average of $361.345.- in our sample of 84 companies. This represents 9.4% of average sales, which in that particular year rose to $3,848.119.- But this average

of $361.000.- conceals considerable differences, since net profits of some companies did not exceed $1000.- or $2000.-, while two companies made profits in excess of 1,000,000.- dollars. On the other hand, one finds considerable differences between profits made from one year to the next (average net profits for 1964: $48.000.-). Table B-36 compares net profits for 1971 to exports. Most of the companies registering the largest profits are engaged in export, but there again it is actually a matter of size. Anyway, the relationship is not significant in statistical terms. In order to eliminate the size factor, ratios must be calculated. We have used three:

a) The first that comes to mind is the net profit - net sales ratio (Table B-37). We have indicated that it averaged 9.5% in 1971. There again, it conceals considerable differences, thus 3 companies made ½% profit while one reached the 20% level. Moreover, this percentage varies considerably from one year to the next: it was 7.5% in 1961, dropped to 4.8% in 1964, then to 3.9% in 1967 and even to 3.7% in 1969 only to rise again in 1971.

Be that as it may, there seems to be no relationship between these ratios and exports. Although there is a slightly higher proportion of exporting companies among the most profitable ones, it is not a signi ficant one.

b) Ratio influence: net profit/owner's worth.

This ratio measures the yield of the owner's actual investment. In 1971, it was an average of 116%, which reflects the low net worth of the owner. However, because of the considerable variations in net profit from year to year, this ratio also fluctuates widely, i.e. it was only

16% in 1970. As can be expected, comparison to the export factor (Table B-38) does not show any significant results.

c) Influence of the ratio: net sales/fixed assets.

This ratio attempts to measure the yield of plant investments compared to operating assets or financial capital. In 1971, the mean ratio was 7.5, i.e. the sales on the average were 7.5 times the fixed assets. Table B-39 shows that although, according to the tests, the relationship is not significant it is amongst those which show the strongest links between the two variables: it is undeniable that among the firms with higher ratios there is a larger proportion of exporting companies and the opposite is true for those with low ratios.

In conclusion, our financial analysis, based on ratios, did not enable us to reveal any valid link between exports and any of the ratios traditionally used in financial analysis. Before deciding that this kind of analysis is futile it must be recognized that we faced a serious handicap, namely the mediocre quality of the financial data available to us. In some of the firms in our study, the accounting system was very inadequate and the value of the data provided thus most questionable. In other companies, the respondents supplied approximate data for the columns from memory without checking the accuracy of the figures. Nevertheless, we are certain that financial analysis based on ratios is less applicable to small firms than to large ones, because the former's financial pattern is subject to considerable variations from year to year, which entails wide variations in its ratios. Finally, there is still the possibility that

exportation does not tangibly affect the operation of a company and, in particular, that it is not reflected in its financial pattern. We do not agree with this opinion, but were unable to prove our point with the data available to us.

III. Characteristics of the entrepreneurs.

We indicated that in a small firm, the entrepreneur or manager exercised a direct influence on operations and determined, frequently by himself, the basic policies of the company. It will thus be he who decides to gear his company towards foreign markets or to confine its operations to the Canadian market. He is convinced that his decision will be mostly based on profit considerations, but we think that his personality may predispose him to consider exporting, or, conversely, to a priori reject such a line. He may be attracted by the exotic lure of foreign markets or he may be looking for risks, hence for a chance at the high profits usually involved, or conversely he may reject all this. Also, his ethnic origin, his past experience (particularly if he has already worked abroad) may sway him in one or the other direction. To be sure, this personal idiosyncrasy of the entrepreneur plays but a secondary supporting role in the company plans, but it is possible that all things being equal, this factor may intensify the other considerations in favour or against export. In this section then, we shall attempt to stress the influence of some of the owner's idiosyncrasies on his decision to export.

The first problem facing us is to determine who is an entrepreneur and who is not. In fact the questionnaires we received were, as often

as not, completed by the treasurer or even by the accountant, that is by subordinates, as by owners or presidents. As far as we are concerned, the entrepreneur is the one who is able to determine the company's goals, to establish in the last instance and without appeal the basic policies of the firm and to take the crucial decisions for its principal operations. In our questionnaire we suggested categories of positions for the respondents to choose. These categories are: owner and founder; majority shareholder but not founder; president and non-majority share owner; vice-president; general manager; and finally "others." It seemed to us that only the first 3 categories fitted the description of entrepreneur: as a result, the characteristics dealt with below will be of persons falling into one of these categories. On the other hand, this selection excluded most of the respondents, which presents a problem in trying to extend the conclusions to the population as a whole. In conclusion, only 46 respondents belonged to the 3 first categories and formed our sub-sample.

1) In Table C-1 we have explored the possible relationship between the age of the entrepreneur and whether his company does or does not export. The tests show clearly that there is no relationship whatsoever.

2) An apparently more logical a priori relationship is that which links the ethnic origin of the entrepreneur to whether his company does or does not export. Thus, other studies show that more new-Canadian and English-Canadian firms export than French-Canadian ones. Table C-2 does not emphasize any such phenomenon. However, it should be noted that the sub-sample includes only a single French-Canadian entrepreneur and due to this it was almost certain that the chi-square test would not be

significant. Nor should it be concluded that there are far more English-Canadian or new-Canadian entrepreneurs than French-Canadian ones. Indeed, among 144 respondents pertaining to the 5 categories mentioned earlier, 64 (44%) declared to be French speaking - thus French-Canadian; 66 (46%) English speaking and 14 (10%) had a foreign mother tongue. As we indicated, of the 144, only 46 could be considered entrepreneurs. However, assuming that the respondents' ethnical origin is the same as that of the owner-manager, i.e. that of the entrepreneur, which seems reasonable on the whole, there would be about the same number of Anglophone and Francophone entrepreneurs, i.e. about 40% in the population as a whole. This same percentage should also be found in our sub-sample. The only thing Table C-2 demonstrates is that French-Canadian entrepreneurs tend to be more willing to have the questionnaire filled out by their staff than English-Canadians or new-Canadians.

3) Another important factor may be that of the educational level of the entrepreneur. All things being equal, one can expect that an entrepreneur with higher education may be more aware of the hazards of exports, but also of potential profits and thus may be more inclined to launch his firm on foreign markets. Table C-3 up to a point, confirms these views since it indicates that there are more exporting firms among those whose executives have a university education. However, in statistical terms, the relationship is not significant.

The level of education is not all, the field may be more important, but Table C-4 shows that this factor does not influence the fact of whether a firm exports or not.

4) The previous occupation of the exporter may predispose him to steer his firm towards exportation. Table C-5 shows that the highest proportion of exporting firms will be found among the firms whose entrepreneur comes from a career such as the military. But once again, in statistical terms the relationship is not significant.

It is striking that there is a relatively high proportion of executives who have worked abroad; of 70 respondents, 31 or 44% had previously worked abroad.

Equally, 40 of 65 respondents (61%) indicated that some members of the executive team had previously worked abroad. However, this fact does not seem to have any impact on the firm's approach.

5) The last factor whose importance we attempted to assess was that of the decentralization of the decision making. To do this we asked whether the actual manager was the only one to take important decisions: the reply was affirmative in 22 out of 46 cases (48%). On the other hand Table C-6 shows again that this relationship was not significant.

Finally it seems that the personal characteristics of the entrepreneur do not play an important role in whether a firm does or does not export. But it must be noted that our sub-sample was very small and that it was thus difficult for any factor to emerge during analysis. Nevertheless we don't believe that these characteristics are actually decisive in the approach of a firm to foreign markets.

C) Exports and the success of the firm:

Up to now we attempted to answer two of the three questions we posed at the beginning of this report, i.e.

1) Is there a relationship between the technological character of a

firm and the fact that it does or does not export?

2) Which are the main characteristics of exporting firms?

It now remains for us to tackle the third question: are exporting firms more successful than others? In a previous study we pointed to the ambiguity of the term success and we then listed some of its constituent elements. Profitability is doubtlessly one of the main components of success. During our analysis of the financial policies we used three ratios to measure the profitability of a firm and we concluded that regardless of the definition for profitability, it did not seem in any significant way linked to exportation. However, we noted that in a small firm the main component of the profitability ratios, i.e. the amount of net profits after taxes, tended to fluctuate considerably from year to year, seriously jeopardizing the stability of any ratio based on it. These cyclical variations also affected sales but to a lesser extent.

For all these reasons we decided to use the long-term growth rate of the business volume as criterion for the success of a firm; by long term we mean a period of 10 years, or from 1961 to 1971. With the TREND ANALYSIS programme we computed the growth rate for each firm. The programme uses a logarithmic method to compute this growth rate. Based on these rates we divided the firms in our sample into three categories: not very successful firms, moderately successful firms and very successful firms (Table D-1). This division, besides being handy, is intended to show that it is the relative value of the growth rate of each firm which matters, its position in relation to others rather than

its absolute value. Success is relative.

The average growth rate, for the 84 respondents, is 11.79% but here again the average conceals considerable differences. Eight firms had negative annual growth rates ranging from -9.47% to -0.78%; in other words, their sales had a tendency to drop during the 10 years between 1961 and 1971. Five other firms had zero annual growth rates; 24 had rates between 0 and 9.9%, 30 had rates ranging from 10% to 19.9%, 15 had rates between 20% and 29.9% and finally three had rates of more than 30%. The highest rate recorded was 35.18% a year.

We are particularly interested in finding out whether there is a relationship between the long-term yearly growth rate and exportation; in other words, is exportation a success factor, i.e. a growth factor for the firm? Table D-1 seems to deny this; the relationship between growth and exports tends to be rather negative but in any case it is not significant.

The average yearly growth rate used up to now has the drawback of putting all firms on the same footing regardless of the industry to which they belong. And a glance at the statistics suffices to show that not all industries grow at the same pace. Thus column 1 of APPENDIX VII shows that between 1961 and 1971 the average annual growth rate was only 1.96% for the aircraft and parts industry, an industry which suffered a long period of recession. On the other hand, it reached 15.03% for the rubber industry. These growth rates were obtained by applying the TREND ANALYSIS programme to the data on business volume in these industries obtained from the Manufacturers Census. In Column 2 of the same Appendix we listed all firms in the sample by industries and we computed the average growth rate for each of the eight industries. If the eight industries are classified in decreasing order of magnitude of

growth rate, we note a striking parallel between the average annual growth rates by industry, obtained from the Manufacturing Census and these same rates obtained from data of our sample, the latter being simply higher. Obviously there are some exceptions, such as the oil industry but this is not important. It is true that a firm in a growth industry has a better chance to have a high growth rate than a similar firm in a depressed industry, regardless of the actual performance of each firm. To emphasize the actual performance, and thus to put all firms on the same basis and to eliminate the influence of the industry, we divided the annual growth rate of each firm by the growth rate for the industry to which it belongs (column 1). For each firm we get a figure which is a measure for its actual performance. The average of the deflated growth rates computed in this way amounted to 1.97 for our sample. This means that the average growth rate for these 84 firms was practically double that of all Canadian firms making up the 8 industries selected.

With the deflated rates we find the same fluctuations as with the normal annual rates: the eight firms previously singled out again have a negative deflated rate ranging from - 1.50 to -0.10. Five had a deflated rate of zero, 16 a rate lower than 1, 25 had a rate between 1 and 2, 20 a rate ranging from 2 to 3 and finally 10 had a rate higher than 3 (one has a rate of nearly 10 and another a rate of 36). APPENDIX VI lists in column 3 the deflated rates per industry: it is noted that in general the firms in our sample have grown much more quickly than the average of the industry to which they belong in the slow growth

industries (Oil industry, aircraft and parts, non-ferrous metals); on the other hand, they are slightly above the average for the industry for those with a high growth rate (rubber, pharmaceuticals).

It remained for us to compare these deflated rates with the export variable, which we did in Table D-2. We again see the same phenomenon as with the normal rate: no significant relationship between growth and exports. Finally, we must believe the evidence: it does not seem that exportation affects the success of a firm in any way regardless of the success criterion used.

VI. SOME MINOR PROBLEMS RELATED TO EXPORTS

Before concluding this long report we would like to quickly touch upon some minor problems related to exportation, problems which we have grouped under five headings:

1) The export product
2) Exports and investments abroad
3) The distribution system abroad
4) Financing problems
5) Main difficulties encountered in exporting

We must point out that these problems involve only exporting companies and can therefore not be analyzed with the double entry tables as was the case for the problems examined earlier.

1) Nature of the export product:

a) The first point to be examined was to find out whether exporting firms sold all the products they manufactured abroad or, if not, what proportion of their total products they exported.

To the first part of the question 27 of 85 firms (about 32%) replied

that they sold all their products abroad while 58 only sold part of theirs. Of these 58, 31 agreed to give some indication of the proportion of products sold abroad compared to their total line: the average was 5.4%, which is relatively little and confirms that for most of the firms of our sample, exportation is only a marginal activity. Ten firms export less than 10% of their total line, six between 10.0% and 19.9%, eight between 20.0% and 49.9% and seven export fifty per cent or more of their total line.

b) The second point involved the actual nature of the export products and was meant to determine whether they were absolutely identical to the Canadian or not. Of the 69 firms which replied to this question, 48 (or about 70%) export the same products as they sell in Canada, 20 firms change their products slightly to adapt them to local conditions and finally one firm manufactures special products for foreign markets.

c) Another point studied was that of the possible time lag between the introduction of a new product to the Canadian market and its introduction to foreign markets. Some authors believe that exporting firms systematically tend to delay introducing their new products on foreign markets because most non-American countries are - as far as technology is concerned - behind North America and are satisfied with less sophisticated models. Others believe that with rapid means of information this is no longer possible today. One could also transform this question into empirical verification of the product cycle theory. Of 61 firms which answered this question 15 or 25% introduce their new products simultaneously in Canada and abroad; the majority (38 firms or 51%) introduce them first in Canada and later abroad; for the 8 others

there is no fixed rule: the decision varies with the product. None test their new products abroad.

2) Exports and Investments abroad:

During the study of the product cycle we saw that exports and investments abroad were two successive phases in the development of a product. We will not revert to this topic except to stress the relationship between exports and investments abroad which GRUBER, VERNON and MEHTA have emphasized.

a) it happens frequently that an exporting firm hesitates to embark on the next stage which is direct investment abroad. Often it prefers to go through an intermediate stage which consists in granting a manufacturing licence of its products to a foreign company. In Table E-1 we have compared the granting of a manufacturing franchise to a foreign company and exports. It should be noted that 17 of 128 respondent firms, i.e. about 13% granted franchises to foreign companies. Three granted franchises to American firms, 7 to European, 2 to Latin-American companies, 2 to Asian companies while the remaining three did not specify. Although, for statistical purposes, the relationship exports/franchise is not quite significant, it is most likely that there is a link between the two: 76.5% of those granting franchises are also exporting companies.

b) The next stage in multi-nationalization of a firm is direct investment. It is quite surprising to find that of our sample 20 of 145 companies (i.e. almost 14%) have foreign investments; this represents a rather high proportion for small companies. It is equally interesting

to see that the exports/direct investment relationship is significant in statistical terms (Table E-2). 79% of firms with direct investments are exporting ones; 23% of the respondent exporters (15 of 65) have direct investments abroad. Although we have not directly verified this fact it seems that the companies involved are the largest in our sample.

Only 18 firms have supplied specific data on the nature of these direct investments: in most cases (7 companies) investments were confined only to manufacturing plants; in 4 cases it involves facilities serving their foreign distribution network; in another four cases, investments were not identified; and finally, 3 companies have investments in both production and distribution. Where were these direct investments made? 4 companies indicated the U.S., 3 Europe and one Asia.

3) The foreign distribution system:

Of the 65 companies which replied to this question, 28 (i.e. 43%) distribute their products through their own network abroad, 5 (less than 8%) utilize the parent-company network, 19 (almost 30%) use foreign distributors, 1 Canadian distributor has his own network abroad; the remaining 12 companies use several systems. We also wanted to know whether the exporting companies engage in a systematic search of markets abroad. The answer was negative for 32 of 67 companies, affirmative in 35 cases. The means used by the latter: Canadian and Quebec government services for 12 among them; visits abroad in 4 cases; various means for 19 firms.

4) The financing of exports:

For most of the respondent exporting companies, exports represent no special financial problem; this was the answer of 48 among 68 companies. How do all these companies finance their exports? 44 of 61 grant no special financing. Their foreign clients enjoy the same credit benefits as Canadians; 6 finance their exports directly through chartered banks; 4 go through the Export Development Company with the remaining 7 using various financing sources.

5) Main difficulties encountered in exporting:

a) One obstacle is mentioned by the great majority of respondent companies: foreign custom duties seem to interfere considerably in the exports of our companies. It has already been established that many companies manufacture abroad to obviate the difficulty.

b) The second hurdle referred to in a decreasing order of frequency, is related to the system of distribution. It seems to be difficult to establish and maintain a proper distribution system.

c) Following immediately in this order are transportation costs, difficulties of communication with foreign buyers, etc....

VII. CONCLUSION: BASIC FACTORS OF EXPORTATION.

At the end of this long study, what conclusion can we reach from this plethora of information? Without going into details, 4 factors play a fundamental role in whether a company exports or not:

1) The foremost factor is probably the size of the company. There is no doubt that there is a far greater proportion of exporting companies among the largest ones. It can even be said, that the

probability that a firm will export is greater the larger the company and this regardless of how one measures the size of the company. This is simply due to the fact that a large company can afford to have its staff specialize and thus to assign personnel full time to export problems, to search constantly for new foreign markets for the products of the company, and who are aware of government measures to promote exports, of special sources for financing, etc. To establish and maintain an export service is very costly; the costs involved can only be borne by a company whose sales volume is high. In a small company these costs would affect the budget too heavily and will be reflected in an increase of the total unit costs of the company.

2) The second important factor is the type of the industry to which the company in question belongs. It is undeniable even there that some industries are more geared towards exports than others and for several reasons: advantages in production cost, greater technical sophistication, etc... In this case competition predisposes all companies in favour of export. The reason may also be the very limited scope of the national market which cannot absorb the full production of the industry. The reason may also be a very pronounced foreign demand, as is the case for non-ferrous metals.

3) A third factor relates to the legal status of the company: the subsidiaries, mainly the foreign subsidiaries, export more than purely national companies. Part of these exports consists of a transfer of goods to the parent-company or its other subsidiaries. However, generally it is noted that multi-national corporations pressure their

subsidiaries to export: their policy is to serve many countries from one regional production center.

4) The last factor, probably the most controversial one, is that of research.

We have found a certain relationship between exports and research, especially among companies in secondary industries, but this relationship is not quite as clear as indicated by other studies conducted mainly in the US. Canadian exports are very different from those of the U.S. and it is likely that research is not quite as important in our exports as for those of our neighbour to the south.

Some additional factors affect the decision to export, but they are not quite of the same importance as the 4 mentioned previously.

On the negative side, our study stressed, on the one hand, that the financial factors (at least the ratios used by us) are of no great consequence, on the other, that the personality and characteristics of the entrepreneur do not seem to have a great influence either on whether the company exports or not.

In con lusion, we present a recommendation: if exports are important for Canada, and this seems to be the case and if the size of the company plays such an important role in the export process, it would be desirable that the Government through various measures promote the regrouping of small companies within a given industry for the purpose of exports. It could help to establish "consortia" made up of a certain number of client companies, whose products would not be in direct competition. These consortia essentially would provide research

and marketing services abroad and would support exports, they would carry out market studies, would handle shipping, insurance, customs, financing, etc. on behalf of the client companies. They could be financed jointly by client companies and by the Government. It is not for us to describe in detail the working modalities of these consortia (various formulae are feasible) but simply to put forward the idea.

CHARACTERISTICS AND PROBLEMS OF SMALL AND MEDIUM EXPORTING FIRMS OF THE QUEBEC MANUFACTURING SECTOR, WITH SPECIAL EMPHASIS ON THOSE WHICH USE ADVANCED PRODUCTION TECHNIQUES

A P P E N D I C E S

GERARD GARNIER

FACULTY OF ADMINISTRATION
UNIVERSITY OF SHERBROOKE

APPENDIX I

INDICATORS FOR RESEARCH AND DEVELOPMENT INTENSITY FOR THE DIFFERENT INDUSTRIES IN CANADA 1967

INDUSTRY	(1) Total intra-muros R & D expenditures (millions $)	(2) Total extra-muros R & D expenditures (millions of $)	(3) Total R & D intra & extra muros expendit. (millions $)	(4) Sales Volume (millions $)	(5) Amount of R & D per $100 sales (3÷4)	(6) Staff engag. in R & D per 1,000 empl.	(7) Scientists & Technicians in R & D per 1,000 empl.
Food & Beverage	8.9	0.7	9.6	2,750	0.35	8.6	4.0
Rubber	3.9	6.1	10.0	534	1.87*	25.0*	10.9*
Textiles	4.0	0.3	4.3	318	1.35	21.2	6.4
Lumber	1.3	0.3	1.6	293	0.55	22.5	2.1
Furniture & furnishings	0.2	0.1	0.3	28	1.07	6.6	2.6
Paper	26.1	4.0	30.1	3,415	0.88	11.0	4.0
Prim. Metals: ferr.	6.2	0.4	6.6	1,274	0.52	5.3	2.2
Prim. Metals: non-ferrous	20.1	7.2	27.3	1,330	2.05*	21.5	8.2
Metal Products	4.9	0.4	5.3	843	0.63	8.0	2.8
Machines	13.8	2.8	16.6	1,033	1.61*	20.6	6.3
Aircraft & Parts	40.9	0.1	41.0	543	7.55*	71.8*	23.2*
Other Transp. Mat.	3.6	0.3	3.9	2,614	0.15	4.6	1.4
Electr. Appliances	94.7	1.6	96.3	1,611	5.98*	54.5*	20.7*
Non-met. Mineral Products	3.3	0.8	4.1	475	0.86	10.8	4.5
Oil	21.5	4.6	26.1	2,373	1.10	22.5	10.1*
Pharmaceut. Prod.	10.5	3.9	14.4	242	5.95*	87.6*	46.4*
Other Chem. Prod.	36.5	1.8	38.3	1,611	2.38*	39.8*	18.2*
Other Manuf. Ind.	3.1	2.8	5.9	443	1.33	32.1*	7.0
TOTAL MANUFACTURING INDUSTRIES	312.7	38.3	351.0	21,896	1.60	24.9	9.8

* higher than the average for all manufacturing indust. (columns 5, 6 & 7)

Source: DBS "Expenditures for Research and Industrial Development in Canada" -1967.
Column 1: Table 3 - Column 2: Table 10 - Column 4: Table 29 - Columns 6 & 7, Table 26

APPENDIX II

BREAK-DOWN OF THE POPULATION AND OF THE SAMPLES

INDUSTRIES	Number of firms			Percentages			Ratio Sample (2) ÷ Popul.(%) 7= (5 ÷ 4)	Ratio % Sample (1)÷Pop.(%) 8 = (6 ÷ 4)
	Population (1)	2nd sample (2)	1st sample (3)	Population (4)	2nd sample (5)	1st sample (6)		
Non-fer. Prim. Metals	22	7	7	5.4%	4.8%	8.4%	0.89	1.56
Machinery (non-electr)	74	30	14	18.0%	20.5%	16.9%	1.14	0.94
Aircraft & Parts	18	3	5	4.4%	2.1%	6.0%	0.48	1.36
Electrical Appliances	98	25	27	23.9%	17.1%	32.5%	0.72	1.36
Oil and Coal	7	10	2	1.7%	6.8%	2.4%	4.00	1.41
Pharmaceutical Prod.	34	8	8	8.3%	5.7%	9.6%	0.69	1.16
Other chem. Prod.	138	54	15	33.7%	36.9%	18.1%	1.09	0.54
Rubber	19	9	5	4.6%	6.1%	6.1%	1.33	1.33
TOTAL	410	146	83	100.0%	100.0%	100.0%		

APPENDIX III (a)
NATURE OF INDUSTRY AND COUNTRY WHERE PRODUCTS ARE SOLD

INDUSTRIES	Number of firms								
	Non-Ferr Metals	Non-elect Machinery	Aircraft & Parts	Electr. Applian-ces	Oil and Coal	Pharma-ceutical Products	Other chemical products	Rubber	Total
Québec only	-	1	-	1	-	1	2	-	5
Québec + other provinces	2	4	-	14	2	5	13	2	42
Total non-exorting firms	2	5	0	15	2	6	15	2	47
U.S.A.	5	9	5	10	-	2	-	3	34
Other countries	4	5	1	9	-	2	-	2	23
Total exporting firms	5	9	5	12	0	2	0	3	36
GRAND TOTAL	7	14	5	27	2	8	15	5	83

INDUSTRIES	COLUMN HEADINGS AS ABOVE Percentages								
	Métaux non-ferreux	Machines non-élec-triques	Avions et pièces	Appareils électri-ques	Pétrole et charbon	Produits pharmaceu-tiques	Autres industries chimiques	Caoutchouc	Total
Québec only	-	7.1%	0.0%	3.7%	-	12.5%	13.3%	-	6.0%
Québec + other provinces	28.6%	28.6%	0.0%	51.9%	100.0%	62.5%	86.7%	40.0%	50.6%
Total non-exporting firms	28.6%	35.7%	0.0%	55.6%	100.0%	75.0%	100.0%	40.0%	56.6%
Canada + U.S.A.	71.4%	64.2%	100.0%	37.0%	0.0%	25.0%	0.0%	60.0%	41.0%
Other countries	57.1%	35.7%	20.0%	33.3%	0.0%	25.0%	0.0%	40.0%	27.7%
Total exporting firms	71.4%	64.3%	100.0%	44.4%	0.0%	25.0%	0.0%	60.0%	43.4%
GRAND TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

APPENDIX III (b)

EXPORTS and NATURE OF INDUSTRIES

INDUSTRIES	Number of firms								
	Non-ferr. Metals	Non-elect Machin-ery	Aircraft & Parts	Electr. Applian-ces	Oil and Coal	Pharmac. Products	Other Chemical Products	Rubber	Total
Non-exporting	2	5	0	15	2	6	15	2	47
Exporting	5	9	5	12	0	2	0	3	36
TOTAL	7	14	5	27	2	8	15	5	83

	Percentages								
Non-exporting	28.6%	35.7%	0.0%	55.6%	100.0%	75.0%	100.0%	40.0%	56.6%
Exporting	71.4%	64.3%	100.0%	44.4%	0.0%	25.0%	0.0%	60.0%	43.4%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

χ^2_1 - Non-ferrous metals	: 2.450	γ : -0.568
" - Non-electr. machinery	: 2.999	" : -0.474
" - aircraft & parts	: 6.946**	" : -1.000
" - electr. appliances	: 0.019	" : -0.032
" - oil & coal	: 1.570	" : 1.000
" - pharmaceutical prod.	: 1.217	" : 0.427
" - other chemical "	: 14.024**	" : 1.000
" - rubber	: 0.599	" : -0.343

APPENDIX IV (a)

EXPORTS OF CANADIAN INDUSTRIES - 1967

INDUSTRIES	Amount of exports ($000) (1)	Amount of Sales ($000) (2)	Exports / Sales x100 (3)	Export Rank (4)	Rank-Expendit. R&D par $100. of sales (5)
Food and Beverages	1,642,349	7,429,270	22.1%	7	16
Rubber	23,569	584,357	4.0%	13	6
Textiles	52,508	1,404,939	3.7%	14	8
Lumber	116,434	1,675,642	6.9%	11	14
Furniture and Furnishings	7,901	640,196	1.2%	17	10
Paper	1,057,600	3,231,176	32.7%	6	11
Prim. Metals: ferrous	251,342	1,690,982	14.9%	9	15
Prim. Metals: non-ferrous	1,140,167	1,766,561	64.5%	1	5
Metal Products	91,456	2,732,066	3.3%	15	13
Machinery (non-electric)	843,704	1,516,875	55.6%	2	7
Aircraft and Parts	237,999	664,149	35.8%	5	1
Other Transportation Mat.	1,642,859	4,056,727	40.5%	3	17
Electrical Appliances	334,906	2,312,519	14.5%	10	2
Non-metallic Mineral Prod.	25,028	1,082,213	2.3%	16	12
Oil (and Coal)	587,046	1,558,207	37.7%	4	9
Pharmaceutical Products	21,154	335,615	6.3%	12	3
Other Chemical Products	380,984	1,838,583	20.7%	8	4
Other manufacturing industries	130,487	1,083,797	12.0%		
TOTAL of the 17 industries	8,587,493	33,765,291	25.4%		
TOTAL manufacturing industries		38,955,389			
TOTAL of the 8 industries selected	3,569,529	10,576,866	33.8%		

APPENDIX IV (b)

EXPORTS OF QUEBEC INDUSTRIES - 1967.

INDUSTRIES	Amounts of Exports ($000) (1)	Amount of Sales ($000) (2)	Exports / Sales (3)	Export Rank (4)	Rank-Expendit. R & D (5)
Food and Beverages	132,886	2,278,127	5.8%	10	16
Rubber	(429)	141,501	0.3%	16	6
Textiles	24,629	853,975	2.9%	14	8
Lumber	73,537	322,928	22.8%	6	14
Furniture and Furnishings	6,741	248,639	2.7%	15	10
Paper	519,502	1,198,864	43.3%	2	11
Prim. Metals : ferrous	59,290	200,014	29.6%	5	15
Prim. Metals: non-ferrous	545,890	1,429,930	38.2%	4	5
Metal Products	23,675	725,216	3.3%	13	13
Machinery (non-electr.)	64,026	837,009	7.6%	9	7
Aircraft and Parts	121,239	290,530	41.7%	3	1
Other transportation mater.	233,036	491,631	47.4%	1	17
Electric Appliances	39,613	809,939	4.9%	12	2
Non-metallic Mineral Prod.	17,299	322,762	5.4%	11	12
Oil (and Coal)	1,285	461,693	0.3%	17	9
Pharmaceutical Products	11,860	143,737	8.3%	8	3
Other chemical Products	67,460	476,031	14.2%	7	4
Other manufacturing industries					
TOTAL of 17 industries	1,942,397	11,232,525	17.29%		
TOTAL manufacturing industries	2,661,316	11,791,529	22.56%		
TOTAL of the 8 industries selected	851,802	4,590,370	18.56%		

APPENDIX V

CHARACTERISTICS OF THE EIGHT QUEBEC INDUSTRIES SELECTED DUE TO THEIR RESEARCH INTENSITY: 1968.

INDUSTRIES	No. of firms (1)	No. of employees (2)	Value of shipments ($000) (3)	Cost of raw materials ($000) (4)	Total value added ($000) (5)	Salaries ($000) (6)	Non-salary value added (7)=(5)-(6)	Non-salary added per employee (7)÷(2)=(8)	Salary per employee (9) (9)=(6)÷(2)	Raw materials in % of total costs	Salaries in % of total costs	Non-salary value added in % of total costs	Rank in exports	Rank in salaries per employee	Rank in research
-Rubber	37	6,780	135,105	59,695	77,145	33,909	43,236	6,377	5,001	44%	25%	31%	7	7	6
-Non-ferrous metals	49	16,874	1,429,840	992,261	412,122	120,068	292,054	17,308	7,115	69%	8%	23%	2	3	5
-Machinery (non-electr.)	122	12,203	304,178	85,706	215,463	73,267	142,196	11,653	6,004	28%	24%	48%	5	6	7
-Aircraft and parts	24	16,868	301,435	117,208	212,455	129,302	83,153	4,930	7,666	36%	39%	25%	1	1	1
-Electr. Appliances	148	28,964	588,987	310,452	283,477	182,082	101,395	3,501	6,286	52%	31%	17%	6	5	2
-Oil & Coal	17	7,027	556,408	414,327	143,413	48,109	95,304	13,563	6,846	74%	9%	17%	8	4	8
-Pharmaceutical Products	65	5,558	150,404	51,287	102,578	40,733	61,845	11,127	7,329	33%	27%	40%	4	2	3
-Other Chemical Products	269	24,853	535,417	227,178	282,290	110,243	172,047	6,923	4,436	45%	22%	33%	3	8	4
TOTAL of 8 industries															
TOTAL of Quebec manufacturing industries	10,361	514,917	13,082,226	6,638,214	5,620,598	2,706,254	2,914,344	5,660	5,256	54%	22%	24%			

r_x - salaries = 0.429

r_x - R & D = 0.620

APPENDIX VI

ANALYSIS OF THE RELATIONSHIP BETWEEN EXPORT PHENOMENA AND VARIOUS VARIABLES FOR THE EIGHT INDUSTRIES SELECTED

A - Characteristics of the environment -

TABLE A-1 Exports and intensity of domestic competition

Intensity of Competition	Number of Firms				Percentages			
	Strong	Medium	Weak	Total	Strong	Medium	Weak	Total
Non-exporting	43	3	1	47	59.7%	60.0%	16.7%	56.6%
Exporting	29	2	5	36	40.3%	40.0%	83.3%	43.4%
TOTAL	72	5	6	83	100.0%	100.0%	100.0%	100.0%

$X_2^2 = 4.205$ $\gamma = 0.456$

TABLE A-2 Exports and Characteristics of Competing Domestic Firms

Size of Competing Firms	Number of Firms			Percentages		
	Large	Small	Total	Large	Small	Total
Non-exporting	31	16	47	56.4%	59.3%	57.3%
Exporting	24	11	35	43.6%	40.7%	42.7%
TOTAL	55	27	82	100.0%	100.0%	100.0%

$X_1^2 = 0.062$ $\gamma = -0.059$

TABLE A-3 Exports and Intensity of Foreign Competition

Intensity of Foreign Competition	Number of Firms				Percentages			
	Strong	Medium	Weak	Total	Strong	Medium	Weak	Total
Non-exporting	20	8	18	46	60.6%	42.1%	60.0%	56.1%
Exporting	13	11	12	36	39.4%	57.9%	40.0%	43.9%
TOTAL	33	19	30	82	100.0%	100.0%	100.0%	100.0%

$X_2^2 = 1.968$ $\gamma = 0.018$

TABLE A-4 Relationship between Exports and the Firm's Awareness of Federal Government Services to Promote Exports

Awareness of Fed. Govt. Export Promotion Programs	Number of Firms			Percentages		
	Aware	Unaware	Total	Aware	Unaware	Total
Non-exporting	46	30	76	45.5%	75.0%	53.9%
Exporting	55	10	65	54.5%	25.0%	46.1%
TOTAL	101	40	141	100.0%	100.0%	100.0%

$X_2^2 = 10.005^{**}$ $\gamma = -0.564$

** Significant Coefficient at a confidence level of 0.01

APPENDIX VI

TABLE A-5 Relationship between exports and the use by the firm of federal government export development programmes.

Use of Federal Export Support Programmes	Number of Firms			Percentages		
	Use	Do Not Use	Total	Use	Do Not Use	Total
Non-exporting	7	19	26	43.8%	73.1%	61.9%
Exporting	9	7	16	56.2%	26.9%	38.1%
TOTAL	16	26	42	100.0%	100.0%	100.0%

$X_2^2 = 3.612$ $Y = -0.555$

TABLE A-6 Relationships between exports and awareness by the firm of availability of provincial export promotion services.

Awareness of Provincial Export Promotion Programmes	Number of Firms			Percentages		
	Aware	Not Aware	Total	Aware	Not Aware	Total
Non-exporting	31	40	71	41.9%	66.7%	53.0%
Exporting	43	20	63	58.1%	33.3%	47.0%
TOTAL	74	60	134	100.0%	100.0%	100.0%

$X_2^2 = 8.164$* $Y = -0.470$

* Significant coefficient at a 0.05 confidence level.

TABLE A-7 Relationship between exports and awareness of the services of the Export Development Corporation

Awareness of the services of the Export Development Company	Number of Firms			Percentages		
	Aware	Unaware	Total	Aware	Unaware	Total
Non-exporting	31	43	74	40.3%	70.5%	53.6%
Exporting	46	18	64	59.7%	29.5%	46.4%
TOTAL	77	61	138	100.0%	100.0%	100.0%

$\chi^2_2 = 12.509^{**}$ $\gamma = -0.560$

TABLE A-8 Exports and requests for government support

Request for Support	Number of Firms			Percentages		
	No	Yes	Total	No	Yes	Total
Non-exporting	19	27	46	86.4%	45.8%	56.7%
Exporting	3	32	35	13.6%	54.2%	43.3%
TOTAL	22	59	81	100.0%	100.0%	100.0%

$\chi^2_2 = 11.551^{**}$ $\gamma = 0.680$

** Correlation coefficient singificant at a 0.01 confidence level

TABLE A-9 Exports and level of government where support requested

Programme requested	Number of firms			Percentages		
	1 single request: federal or provincial	both governments	Total	1 single request: federal or provinc.	both governments	Total
Non-exporting	25	2	27	61.0%	11.1%	45.8%
Exporting	16	16	32	39.0%	88.9%	54.2%
TOTAL	41	18	59	100.0%	100.0%	100.0%

$\chi^2_1 = 12.531^{**}$ $\gamma = 0.852$

TABLE A-10 Exports and Granting of Suport Requested

Support granted	Number of Firms			Percentages		
	No	Yes	Total	No	Yes	Total
Non-exporting	4	23	27	66.7%	45.1%	47.4%
Exportin g	2	28	30	33.3%	54.9%	52.6%
TOTAL	6	51	57	100.0%	100.0%	100.0%

$\chi^2_1 = 1.002$ $\gamma = 0.418$

** Coefficient significant at a 0.01 confidence level

APPENDIX VI

B - Characteristics of the firm

TABLE B-1 Exports and the age of the firm (date of foundation)

Date of Foundation	Number of Firms				Percentages			
	1905-1937	1938-1952	1953-1971	Total	1905-1937	1938-1952	1953-1971	Total
Non-exporting	16	17	12	45	76.2%	63.0%	42.9%	59.2%
Exporting	5	10	16	31	23.8%	37.0%	57.1%	40.8%
TOTAL	21	27	28	76	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 5.765^*$ $\gamma = 0.444$

TABLE B-2(a) Exports and number of employees in 1973 (Size)

Number of Employees 1973 =	Number of Firms				Percentages			
	1-12	13-45	46 and above	Total	1-12	13-45	46 + above	Total
Non-exporting	34	24	20	78	81.0%	64.9%	33.3%	56.1%
Exporting	8	13	40	61	19.0%	35.1%	66.7%	43.9%
TOTAL	42	37	60	139	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 24.317^{**}$ $\gamma = 0.637$

* Coefficient significant at a 0.05 confidence level

** Coefficient significant at a 0.01 confidence level

TABLE B-2(b) Relationship between the total sales percentage alloted to exports and number of employee

Export Sales / Total Sales (%)	Number of employees				Percentages			
	1-12 employés	13-45	46 + above	Total	1-12 employés	13-45	46 + above	Total
0.01% - 0.25%	1	1	7	9	50.0%	16.7%	36.8%	33.3%
0.26% - 1%	1	4	3	8	50.0%	66.6%	15.8%	29.7%
1.01% - 100%	0	1	9	10	0.0%	16.7%	47.4%	37.0%
TOTAL	2	6	19	27	100.0%	100.0%	100.0%	100.0%

$X^2_4 = 6.984$ $\gamma = 0.240$

TABLEAU B-3 Exportation et montant des ventes en 1973 (milliers de dollars).
TABLE Exports and Sales Volume in 1973 (thousands of dollars)

Ventes 1973 Sales	3 Nombre d'entreprises				4 Pourcentages			
	0-561	562-2,400	2,401 et plus 5	Total	0-561	562-2,400	2,401 et plus 5	Total
2 N'exportent pas	18	11	12	41	75.0%	47.8%	46.2%	57.3%
1 Exportent	6	12	14	32	25.0%	52.2%	53.8%	42.7%
TOTAL	24	23	26	73	100.0%	100.0%	100.0%	100.0%

$X^2_2 = 5.166$ $\gamma = 0.376$

1= exporting
2= non-exporting
3= number of firms
4= Percentages
5= and above

TABLEAU B-4 Exportations et montant des actifs totaux en 1971 (milliers de dollars).

TABLE Exports and volume of total assets in 1071 ($000)

Montant des actifs totaux - 1971 Amount of total assets	No. of firms Nombre d'entreprises				Percentages Pourcentages			
	0 - 249	250-499	500 et plus	Total	0 - 249	250-499	500 et plus	Total
1 N'exportent pas	17	15	15	47	70.8%	57.7%	45.5%	56.6%
2 Exportent	7	11	18	36	29.2%	42.3%	54.5%	43.4%
TOTAL	24	26	33	83	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 3.661$ $\gamma = 0.341$

TABLEAU B-5 Exportations et nombre de clients de l'entreprise.

TABLE Exports and number of customers of the firm

Nombre de clients No. of customers	Nombre d'entreprises No. of firms			Pourcentages Percentages		
	1 à 50	Plus de 50 More than	Total	1 à 50	Plus de 50 More than	Total
1 N'exportent pas	4	43	47	40.0%	58.9%	56.6%
2 Exportent	6	30	36	60.0%	41.1%	43.4%
TOTAL	10	73	83	100.0%	100.0%	100.0%

$\chi^2_1 = 1.280$ $\gamma = -0.365$

1 Non-exporting
2 Exporting

1 TABLEAU B-6 2 Exportations et pourcentage du chiffre d'affaires réalisé avec les trois principaux clients.

3 Pourcentage du chiffre d'affaires	4 Nombre d'entreprises				5 Pourcentages			
	0-10%	11-33%	34% et plus 6	Total	0-10%	11-33%	34% et plus 6	Total
7 N'exportent pas	7	7	10	24	58.3%	53.8%	50.0%	53.3%
8 Exportent	5	6	10	21	41.7%	46.2%	50.0%	46.7%
TOTAL	12	13	20	45	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 0.211$ $\gamma = 0.113$

1 TABLEAU B-7 9 Exportations et pourcentage du chiffre d'affaires réalisé avec le principal client.

3 Pourcentage du chiffre d'affaires	4 Nombre d'entreprises				5 Pourcentages			
	0 - 5%	6 - 15%	16% et plus 6	Total	0 - 5%	6 - 15%	16% et plus 6	Total
7 N'exportent pas	7	6	2	15	53.8%	46.2%	100.0%	53.6%
8 Exportent	6	7	0	13	46.2%	53.8%	0	46.4%
TOTAL	13	13	2	28	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 2.021$ $\gamma = -0.117$

1= TABLE
2= Exports and percentages of business volume with the three major customers
3= percentage of business volume
4= number of firms
5= percentages
6= and above
7= Non-exporting
8= exporting
9= Exports and Percentage of Business Volume with the Major Client

TABLE B-8 EXPORTS AND LEGAL STATUS OF THE FIRM: SUBSIDIARY OR INDEPENDENT?

LEGAL STATUS	NUMBER OF FIRMS			PERCENTAGES		
		SUBSIDIARIES	Total		SUBSIDIARIES	Total
NON-EXPORTING	54	23	77	57.4%	46.0%	53.5%
EXPORTING	40	27	67	42.6%	54.0%	46.5%
TOTAL	94	50	144	100.0%	100.0%	100.0%

$\chi^2_2 = 1.719$ $\gamma = -0.226$

TABLE B-9 RELATIONSHIP BETWEEN SUBSIDIARIES AND NON-SUBSIDIARIES AND THE COUNTRY OF EXPORT.

PRICE OF SALE	NUMBER OF FIRMS			PERCENTAGES		
	SUB-SIDIARIES	INDEPENDENTS	Total	SUB-SIDIARIES	INDEPENDENTS	Total
CANADA ONLY (no exports)	23	54	77	46.0%	57.4%	53.5%
Canada + U.S.A.	23	30	53	46.0%	31.9%	36.8%
CANADA & OTHER COUNTRIES EXCLUDING U.S.A.	3	7	10	6.0%	7.4%	6.9%
CANADA & U.S.A. & OTHER COUNTRIES	1	3	4	2.0%	3.3%	2.8%
TOTAL EXPORTING FIRMS	27	40	67	54.0%	42.6%	46.5%
GRAND TOTAL	50	94	144	100.0%	100.0%	100.0%

$\chi^2_6 = 2.824$ $\gamma = -0.155$

TABLE B-10 RELATIONSHIP BETWEEN EXPORTS AND THE COUNTRY OF ORIGIN OF PARENT-COMPANY OF SUBSIDIARIES.

HEADQUARTERS COUNTRY	NUMBER OF FIRMS				PERCENTAGES			
	Canada	U.S.A.	OTHER COUNTRIES	Total	Canada	U.S.A.	OTHER COUNTRIES	Total
NON-EXPORTING	14	8	1	23	66.7%	40.0%	11.1%	46.0%
EXPORTING	7	12	8	27	33.3%	60.0%	88.9%	54.0%
TOTAL	21	20	9	50	100.0%	100.0%	100.0%	100.0%

$X^2_3 = 8.311^*$ $\gamma = 0.642$

TABLE B-11 RELATIONSHIP BETWEEN THE COUNTRY OF THE PARENT-COMPANY AND PLACE OF SALE OF PRODUCTS.

HEADQUARTERS COUNTRY → COUNTRY OF SALE ↓	NUMBER OF FIRMS				PERCENTAGES			
	Canada	U.S.A.	OTHER COUNTRIES	Total	Canada	U.S.A.	OTHER COUNTRIES	Total
CANADA ONLY	14	8	1	23	66.7%	40.0%	11.1%	46.0%
Canada + U.S.A.	6	11	6	23	28.5%	55.0%	66.7%	46.0%
CANADA AND OTHER COUNTRIES, EXCLUDING U.S.A.	0	1	2	3	-	5.0%	22.2%	6.0%
CANADA & USA & OTHER COUNTRIES	1	-	-	1	4.8%	-	-	2.0%
TOTAL EXPORTING FIRMS	7	12	8	27	33.3%	60.0%	88.9%	54.0%
GRAND TOTAL	21	20	9	50	100.0%	100.0%	100.0%	100.0%

$X^2_9 = 13.684$ $\gamma = 0.584$

* COEFFICIENT SIGNIFICANT AT A CONFIDENCE LEVEL OF 0.05.

TABLE B-12 RELATIONSHIP BETWEEN THE PARENT-COMPANY COUNTRY AND PERCENTAGE OF SALES OF THE SUBSIDIARY TO THE PARENT-COMPANY

SALES PERCENTAGE TO PARENT-COMPANY → / COUNTRY OF PARENT-COMPANY ↓	NUMBER OF FIRMS				PERCENTAGES			
	0%	1 - 5%	6% and above	Total	0%	1 - 5%	6% and above	Total
Canada	22	0	1	23	95.6%	-	0.4%	100.0%
U.S.A.	12	5	4	21	57.1%	23.8%	19.1%	100.0%
OTHER COUNTRIES	4	2	3	9	44.4%	22.3%	33.3%	100.0%
TOTAL	38	7	8	53	71.7%	13.2%	15.1%	100.0%

$\chi^2_6 = 12.733^*$ $\gamma = 0.702$

TABLE B-13 RELATIONSHIP BETWEEN THE LEGAL STATUS OF THE FIRM AND THE NUMBER OF ITS EMPLOYEES (1973)

NUMBER OF EMPLOYEES	NUMBER OF FIRMS				PERCENTAGES			
	5 - 12	13 - 45	46 and above	Total	5 - 12	13 - 45	46 and above	Total
SUBSIDIARY	7	14	30	51	13.7%	27.5%	58.8%	100.0%
INDEPENDENT	35	23	32	90	38.9%	25.5%	35.6%	100.0%
TOTAL	42	37	62	141	29.8%	26.2%	44.0%	100.0%

$\chi^2_4 = 10.973^*$ $\gamma = -0.456$

* Coefficient significant at a 0.05 confidence level.

TABLE B-14 RELATIONSHIP BETWEEN THE LEGAL STATUS OF THE FIRM AND ITS SALES VOLUME (1973)

SALES - 1973 ($000)	NUMBER OF FIRMS				PERCENTAGES			
	1 - 560	561-2,400	2,401 and above	Total	1 - 560	561-2,400	2,401 and above	Total
SUBSIDIARIES	3	6	16	25	12.0%	24.0%	64.0%	100.0%
INDEPENDENTS	21	18	11	50	42.0%	36.0%	22.0%	100.0%
TOTAL	24	24	27	75	32.0%	32.0%	36.0%	100.0%

$\chi^2_4 = 13.604^*$ $\gamma = -0.661$

TABLE B-15 EXPORTS AND FINANCE PLANNING

FINANCE PLANS	NUMBER OF FIRMS				PERCENTAGES			
	NO PLANS	PLANS FOR ONE YEAR OR LESS	PLANS FOR LONGER THAN ONE YEAR	Total	NO PLANS	PLANS FOR 1 YR. OR LESS	PLANS FOR LONGER THAN 1yr.	Total
NON-EXPORTING	13	24	10	47	76.5%	50.0%	55.6%	56.6%
EXPORTING	4	24	8	36	23.5%	50.0%	44.4%	43.4%
TOTAL	17	48	18	83	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 3.592$ $\gamma = 0.236$

* COEFFICIENT SIGNIFICANT AT A 0.05 CONFIDENCE LEVEL

TABLE B-16 EXPORTS AND MARKETING PLANNING

MARKETING PLANS	NUMBER OF FIRMS				PERCENTAGES			
	NO PLANS	PLANS FOR L yr. OR LESS	PLANS FOR MORE THAN 1 yr.	Total	NO PLANS	PLANS FOR L YR. OR LESS	PLANS FOR MORE THAN 1 YR.	Total
NON-EXPORTING	13	20	14	47	68.4%	51.3%	56.0%	56.6%
EXPORTING	6	19	11	36	31.6%	48.7%	44.0%	43.4%
TOTAL	19	39	25	83	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 1.534$ $\gamma = 0.130$

TABLE B-17 EXPORTS AND PRODUCTION PLANNING.

PRODUCTION PLANS	NUMBER OF FIRMS				PERCENTAGES			
	NO PLANS	PLANS FOR 1YR. OR LESS	PLANS FOR MORE THAN 1 YR.	Total	NO PLANS	PLANS FOR 1 YR. OR LESS	PLANS FOR MORE THAN 1 YR.	Total
NON-EXPORTING	13	27	7	47	76.5%	50.9%	53.8%	56.6%
EXPORTING	4	26	6	36	23.5%	49.1%	46.2%	43.4%
TOTAL	17	53	13	83	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 3.463$ $\gamma = 0.290$

TABLE B-18 EXPORTS AND NUMBER OF NEW PRODUCTS INTRODUCED OVER 5 YEARS (1969-1974)

NUMBER OF NEW PRODUCTS	NUMBER OF FIRMS				PERCENTAGES			
	0	1 à 7	8 and above	Total	0	1 à 7	8 and above	Total
NON-EXPORTING	30	27	22	79	62.5%	50.9%	48.9%	54.1%
EXPORTING	18	26	23	67	37.5%	49.1%	51.1%	45.9%
TOTAL	48	53	45	146	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 2.069$ $\gamma = 0.180$

TABLE B-19 EXPORTS AND CHANGES IN ACTIVITY OR PRODUCT LINE

CHANGES IN ACTIVITY OR PRODUCT LINE	NUMBER OF FIRMS			PERCENTAGES		
	YES	NO	Total	YES	NO	Total
NON-EXPORTING	26	46	72	49.1%	57.5%	54.1%
EXPORTING	27	34	61	50.9%	42.5%	45.9%
TOTAL	53	80	133	100.0%	100.0%	100.0%

$\chi^2_2 = 1.758$ $\gamma = -0.192$

TABLE B-20 EXPORTS AND CHARACTERISTICS OF PRODUCTS

TYPE OF PRODUCT	NUMBER OF FIRMS			PERCENTAGES		
	INDUSTRIAL	CONSUMER GOODS	Total	INDUSTRIAL	CONSUMER GOODS	Total
NON-EXPORTING	37	36	73	48.1%	63.2%	54.5%
EXPORTING	40	21	61	51.9%	36.8%	45.5%
TOTAL	77	57	134	100.0%	100.0%	100.0%

$\chi^2_2 = 3.014$ $\gamma = -0.299$

TABLE B-21 EXPORTS AND TYPE OF PRODUCTS MANUFACTURED BY THE FIRM.

TYPE OF PRODUCT	NUMBER OF FIRMS				PERCENTAGES			
	STANDARD	CUSTOM MADE	BOTH	Total	STANDARD	CUSTOM MADE	BOTH	Total
NON-EXPORTING	32	16	27	75	58.2%	50.0%	50.0%	53.2%
EXPORTING	23	16	27	66	41.8%	50.0%	50.0%	46.8%
TOTAL	55	32	54	141	100.0%	100.0%	100.0%	100.0%

$\chi^2_3 = 0.902$ $\gamma = 0.120$

TABLE B-22 DO YOU CONSIDER YOUR FIRM A "TECHNOLOGICAL" ONE? RELATIONSHIP TO EXPORTS.

TECHNOLOGICAL FIRM?	NUMBER OF FIRMS			PERCENTAGES		
	YES	NO	Total	YES	NO	Total
NON-EXPORTING	23	55	78	35.9%	68.8%	54.2%
EXPORTING	41	25	66	64.1%	31.2%	45.8%
TOTAL	64	80	144	100.0%	100.0%	100.0%

$\chi^2_2 = 15.420^{**}$ $\gamma = -0.594$

TABLE B-23 RELATIONSHIP BETWEEN IN-HOUSE RESEARCH AND EXPORTS.

IN-HOUSE RESEARCH	NUMBER OF FIRMS			PERCENTAGES		
	YES	NO	Total	YES	NO	Total
NON-EXPORTING	52	23	75	50.5%	62.2%	53.6%
EXPORTING	51	14	65	49.5%	37.8%	46.4%
TOTAL	103	37	140	100.0%	100.0%	100.0%

$\chi^2_2 = 1.492$ $\gamma = -0.234$

** COEFFICIENT SIGNIFICANT AT A 0.01 CONFIDENCE LEVEL.

TABLE B-24 RELATIONSHIP BETWEEN THE KIND OF RESEARCH CARRIED OUT AND EXPORTATION.

LEVEL OF RESEARCH	NUMBER OF FIRMS					PERCENTAGES				
	IMPROVEMENT OF PRESENT PRODUCTION	NEW PRODUCTS	BASIC RESEARCH	SEVERAL KINDS	Total	IMPROVEMENT OF PRESENT PRODUCTION	NEW PRODUCTS	BASIC RESEARCH	SEVERAL KINDS	Total
NON-EXPORTING	16	7	3	27	53	72.7%	38.9%	50.0%	45.0%	50.0%
EXPORTING	6	11	3	33	53	27.3%	61.1%	50.0%	55.0%	50.0%
TOTAL	22	18	6	60	106	100.0%	100.0%	100.0%	100.0%	100.0%

$\chi^2_3 = 6.034$ $\gamma = 0.271$

TABLE B-25 RELATIONSHIPS BETWEEN EXPORTS AND NUMBER OF FULL-TIME STAFF ENGAGED IN RESEARCH - 1973.

NUMBER OF EMPLOYEES	NUMBER OF FIRMS				PERCENTAGES			
	1	2	3 and above	Total	1	2	3and above	Total
NON-EXPORTING	9	7	4	20	47.4%	58.3%	23.5%	41.7%
EXPORTING	10	5	13	28	52.6%	41.7%	76.5%	58.3%
TOTAL	19	12	17	48	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 3.926$ $\gamma = 0.321$

TABLE B-26 RELATIONSHIP BETWEEN EXPORTS AND RESEARCH BUDGET - 1973.

RESEARCH EXPENDITURES	NUMBER OF FIRMS				PERCENTAGES			
	$1. - $7,000.	$8,000. - $35,900.	$36,000. and above	Total	$1. - $7,000.	$8,000. - $35,900.	$36,000. and above	Total
NON-EXPORTING	16	10	7	33	76.2%	43.5%	33.3%	50.8%
EXPORTING	5	13	14	32	23.8%	56.5%	66.7%	49.2%
TOTAL	21	23	21	65	100.0%	100.0%	100.0%	100.0%

$X^2_2 = 8.473^*$ $\gamma = 0.629$

TABLE B-27 RELATIONSHIP BETWEEN EXPORTS AND SALES PERCENTAGE ALLOTTED TO RESEARCH (1973).

PERCENTAGE OF RESEARCH/SALES	NUMBER OF FIRMS				PERCENTAGES			
	0.1 - 0.4%	0.5 - 2.5%	2.6% and above	Total	0.1 - 0.4%	0.5 - 2.5%	2.6% and above	Total
NON-EXPORTING	7	6	12	25	63.6%	46.2%	70.6%	61.0%
EXPORTING	4	7	5	16	36.4%	53.8%	29.4%	39.0%
TOTAL	11	13	17	41	100.0%	100.0%	100.0%	100.0%

$X^2_3 = 1.893$ $\gamma = -0.156$

* COEFFICIENT SIGNIFICANT AT A CONFIDENCE LEVEL OF 0.05

TABLE B-28 RELATIONSHIP BETWEEN LEGAL STATUS OF FIRM AND SOURCE OF TECHNOLOGY USED (research).

SOURCE OF TECHNOLOGY	NUMBER OF FIRMS						PERCENTAGES					
	PARENT COMPANY	MANUFACTURING FRANCHISES	OUTSIDE CONSULTANTS	IN-HOUSE	SEVERAL SOURCES	Total	PARENT COMPANY	MANUFACTURING FRANCHISES	OUTSIDE CONSULTANTS	IN-HOUSE	SEVERAL SOURCES	Total
SUBSIDIARIES	26	3	3	7	12	51	51.0%	5.9%	5.9%	13.7%	23.5%	100.0%
INDEPENDENTS	0	9	24	44	3	80	-	11.3%	30.0%	55.0%	3.7%	100.0%
TOTAL	26	12	27	51	15	131	19.8%	9.2%	20.6%	38.9%	11.5%	100.0%

$\chi^2_8 = 74.823^{**}$ $\gamma = 0.350$

TABLE B-29 EXPORTS AND SOURCE OF TECHNOLOGY USED BY FIRM.

SOURCE OF TECHNOLOGY	NUMBER OF FIRMS						PERCENTAGES					
	PARENT COMPANY	MANUFACTURING FRANCHISES	OUTSIDE CONSULTANTS	IN-HOUSE	SEVERAL SOURCES	Total	PARENT COMPANY	MANUFACTURING FRANCHISES	OUTSIDE CONSULTANTS	IN-HOUSE	SEVERAL SOURCES	Total
NON-EXPORTING	11	7	15	27	3	63	44.0%	58.3%	55.6%	54.0%	21.4%	49.2%
EXPORTING	14	5	12	23	11	65	56.0%	41.7%	44.4%	46.0%	78.6%	50.8%
TOTAL	25	12	27	50	14	128	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

$\chi^2_4 = 5.888$ $\gamma = 0.100$

* COEFFICIENT SIGNIFICANT AT A 0.01 CONFIDENCE LEVEL.

TABLE B-30 RELATIONSHIP BETWEEN EXPORTS AND AMOUNT OF OPERATING ASSETS (1971).

OPERATING ASSETS ($000)	NUMBER OF FIRMS				PERCENTAGES			
	0 - 300	301 - 1,000	MORE THAN 1,000	Total	0 - 300	301 - 1,000	MORE THAN 1,000	Total
NON-EXPORTING	9	16	7	32	56.3%	72.7%	35.0%	55.2%
EXPORTING	7	6	13	26	43.7%	27.3%	65.0%	44.8%
TOTAL	16	22	20	58	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 6.039^*$ $\gamma = 0.302$

TABLE B-31 RELATIONSHIP BETWEEN EXPORTS AND QUICK RATIO.

QUICK RATIO	NUMBER OF FIRMS				PERCENTAGES			
	0 - 2	2.01 - 3	3.01 and above	Total	0 - 2	2.01 - 3	3.01 and above	Total
NON-EXPORTING	7	13	6	26	35.0%	65.0%	54.5%	51.0%
EXPORTING	13	7	5	25	65.0%	35.0%	45.5%	49.0%
TOTAL	20	20	11	51	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 3.673$ $\gamma = -0.320$

* COEFFICIENT SIGNIFICANT AT A 0.05 LEVEL.

TABLE B-32 RELATIONSHIP BETWEEN EXPORTS AND TURNOVER OF STOCK.

TURNOVER OF STOCK	NUMBER OF FIRMS				PERCENTAGES			
	0 - 5	5 - 10	10 and more	Total	0 - 5	5 - 10	10 and more	Total
NON-EXPORTING	11	5	9	25	55.0%	45.5%	47.4%	50.0%
EXPORTING	9	6	10	25	45.0%	54.5%	52.6%	50.0%
TOTAL	20	11	19	50	100.0%	100.0%	100.0%	100.0%

$X_2^2 = 0.344$ $\gamma = 0.113$

TABLE B-33 RELATIONSHIP BETWEEN EXPORTS AND COLLECTION PERIOD FOR ACCOUNTS RECEIVABLE.

COLLECTION PERIOD FOR RECEIVABLES (days)	NUMBER OF FIRMS				PERCENTAGES			
	0 - 54 DAYS	55 - 91 DAYS	92 DAYS AND ABOVE	Total	0 - 54 DAYS	55 - 91 DAYS	92 DAYS AND ABOVE	Total
NON-EXPORTING	12	9	5	26	48.0%	64.3%	38.5%	50.0%
EXPORTING	13	5	8	26	52.0%	35.7%	61.5%	50.0%
TOTAL	25	14	13	52	100.0%	100.0%	100.0%	100.0%

$X_2^2 = 1.875$ $\gamma = 0.048$

TABLE B-34 RELATIONSHIP BETWEEN EXPORTS AND NET WORTH OF OWNER(1971).

OWNER'S NET WORTH	NUMBER OF FIRMS				PERCENTAGES			
	0 - 200	201 - 500	MORE THAN 500	Total	0 - 200	201 - 500	MORE THAN 500	Total
NON-EXPORTING	11	9	12	32	57.9%	52.9%	52.2%	54.2%
EXPORTING	8	8	11	27	42.1%	47.1%	47.8%	45.8%
TOTAL	19	17	23	59	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 0.153$ $\gamma = 0.077$

TABLE B-35 RELATIONSHIP BETWEEN EXPORTS AND TOTAL DEPTS/TOTAL LIABILITIES RATIO.

TOTAL DEBTS/ TOTAL LIABILITIES	NUMBER OF FIRMS				PERCENTAGES			
	0 - 40%	41 - 62.5%	63% and above	Total	0 - 40%	41 - 62.5%	63% and above	Total
NON-EXPORTING	8	9	6	23	50.0%	64.3%	75.0%	60.5%
EXPORTING	8	5	2	15	50.0%	35.7%	25.0%	39.5%
TOTAL	16	14	8	38	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 1.526$ $\gamma = 0.339$

TABLE B-36 RELATIONSHIP BETWEEN EXPORTS AND NET PROFITS (1971).

AMOUNT OF NET PROFITS	NUMBER OF FIRMS				PERCENTAGES			
	1 - 10,000	10,000 - 30,000	30,000 and above	Total	1 - 10,000	10,000 - 30,000	30,000 and above	Total
NON-EXPORTING	3	13	19	35	50.0%	65.0%	46.3%	52.2%
EXPORTING	3	7	22	32	50.0%	35.0%	53.7%	47.8%
TOTAL	6	20	41	67	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 1.889$ $\gamma = 0.239$

TABLE B-37 RELATIONSHIP BETWEEN EXPORTS AND NET PROFITS/NET SALES RATIO.

NET PROFITS/SALES	NUMBER OF FIRMS				PERCENTAGES			
	0 - 4%	4.1-6.4%	6.5% and above	Total	0 - 4%	4.1 - 6.4%	6.5% and above	Total
NON-EXPORTING	4	11	9	24	44.4%	64.7%	40.9%	50.0%
EXPORTING	5	6	13	24	55.6%	35.3%	59.1%	50.0%
TOTAL	9	17	22	48	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 2.309$ $\gamma = 0.174$

TABLE B-38 RELATIONS BETWEEN EXPORTS AND NET PROFITS/OWNER'S NET WORTH RATIO.

NET PROFIT/ OWNER'S NET WORTH	NUMBER OF FIRMS				PERCENTAGES			
	0 - 10%	10.1 - 15%	15.1% and above	Total	0 - 10%	10.1 - 15%	15.1% and above	Total
NON-EXPORTING	9	14	4	27	42.9%	60.9%	44.4%	50.9%
EXPORTING	12	9	5	26	57.1%	39.1%	55.6%	49.1%
TOTAL	21	23	9	53	100.0%	100.0%	100.0%	100.0%

$X_2^2 = 1.608$ $\gamma = -0.125$

TABLE B-39 RELATIONSHIP BETWEEN EXPORTS AND NET SALES/FIXED ASSETS RATIO.

NET SALES/ FIXED ASSETS (plant)	NUMBER OF FIRMS				PERCENTAGES			
	0 - 5	5.1 - 10	10.1 and above	Total	0 - 5	5.1 - 10	10.1 and above	Total
NON-EXPORTING	9	13	4	26	69.2%	52.0%	33.3%	52.0%
EXPORTING	4	12	8	24	30.8%	48.0%	66.7%	48.0%
TOTAL	13	25	12	50	100.0%	100.0%	100.0%	100.0%

$X_2^2 = 3.222$ $\gamma = 0.420$

C=CHARACTERISTICS OF THE ENTREPRENEUR

TABLE C-1 EXPORTS AND THE AGE OF THE ENTREPRENEUR.

AGE (years)	NUMBER OF FIRMS			PERCENTAGES		
	20 - 39	40 and above	Total	20 - 39	40 and above	Total
NON-EXPORTING	5	21	26	50.0%	60.0%	57.8%
EXPORTING	5	14	19	50.0%	40.0%	42.2%
TOTAL	10	35	45	100.0%	100.0%	100.0%

$\chi_1^2 = 0.319$ $\gamma = -0.200$

TABLE C-2 EXPORTS AND ETHNIC GROUP OF THE ENTREPRENEUR.

ETHNIC GROUP	NUMBER OF FIRMS				PERCENTAGES			
	FRENCH CANADIAN	ENGLISH CANADIAN	NEW CANADIAN	Total	FRENCH CANADIAN	ENGLISH CANADIAN	NEW CANADIAN	Total
NON-EXPORTING	1	22	4	27	100.0%	57.9%	57.1%	58.7%
EXPORTING	0	16	3	19	0	42.1%	42.9%	41.3%
TOTAL	1	38	7	46	100.0%	100.0%	100.0%	100.0%

$\chi_2^2 = 0.721$ $\gamma = 0.141$

TAB:E C-3 EXPORTS AND EDUCATIONAL LEVEL OF THE ENTREPRENEUR.

EDUCATIONAL LEVEL	NUMBER OF FIRMS				PERCENTAGES			
	ELEMENTARY & SECONDARY SCHOOL	COLLEGE OR TECHNICAL COLLEGE	UNIVERSITY	Total	ELEMENTARY & SECONDARY SCHOOL	COLLEGE OR TECHNICAL COLLEGE	UNIVERSITY	Total
NON-EXPORTING	8	7	12	27	57.1%	87.5%	50.0%	58.7%
EXPORTING	6	1	12	19	42.9%	12.5%	50.0%	41.3%
TOTAL	14	8	24	46	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 3.500$ $\gamma = 0.197$

TABLE C-4 EXPORTS AND AREA OF STUDY OF ENTREPRENEUR.

FIELD OF STUDY	NUMBER OF FIRMS				PERCENTAGES			
	ELEMENTARY, SECONDARY, COLLEGE	TECHNICAL & SCIENTIFIC EDUCATION (university)	UNIVERSITY ADMINISTRATION	Total	ELEMENTARY, SECONDARY, COLLEGE	TECHNICAL & SCIENTIFIC EDUCATION (university)	UNIVERSITY ADMINISTRATION	Total
NON-EXPORTING	8	9	10	27	53.3%	64.3%	62.5%	60.0%
EXPORTING	7	5	6	18	46.7%	35.7%	37.5%	40.0%
TOTAL	15	14	16	45	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 0.427$ $\gamma = -0.126$

TABLE C-5 EXPORTS AND PREVIOUS OCCUPATION OF THE ENTREPRENEUR.

PREVIOUS OCCUPATION	NUMBER OF FIRMS						PERCENTAGE					
	STUDENT	ADMINIS-TRATIVE JOB	TECHNICAL JOB	SALES	OTHER (military)	Total	STUDENT	ADMINIS-TRATIVE JOB	TECHNICAL JOB	SALES	OTHER (military)	Total
NON-EXPORTING	8	2	9	2	5	26	66.7%	66.7%	69.2%	50.0%	41.7%	59.1%
EXPORTING	4	1	4	2	7	18	33.3%	33.3%	30.8%	50.0%	58.3%	40.9%
TOTAL	12	3	13	4	12	44	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

$\chi^2_4 = 2.553$ $\gamma = 0.296$

TABLE C-6 EXPORTS AND ENTREPRENEUR'S ABILITY TO DELEGATE AUTHORITY.

ABILITY TO DELEGATE	NUMBER OF FIRMS			PERCENTAGE		
	YES	NO	Total	YES	NO	Total
NON-EXPORTING	14	13	27	63.6%	54.2%	58.7%
EXPORTING	8	11	19	36.4%	45.8%	41.3%
TOTAL	22	24	46	100.0%	100.0%	100.0%

$\chi^2_1 = 0.425$ $\gamma = 0.194$

D=EXPORTS AND SUCCESS

TABLE D-1

RELATIONSHIP BETWEEN EXPORTS AND ANNUAL LONG-TERM GROWTH RATE.

ANNUAL GROWTH RATE	NUMBER OF FIRMS				PERCENTAGES			
	- 10% to + 7%	7.1% to 16.5%	16.6% and higher	Total	- 10% to + 7%	7.1% to 16.5%	16.6% and higher	Total
NON-EXPORTING	14	17	16	47	51.9%	58.6%	59.3%	56.6%
EXPORTING	13	12	11	36	48.1%	41.4%	40.7%	43.4%
TOTAL	27	29	27	83	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 0.374$ $\gamma = -0.099$

TABLE D-2

RELATIONSHIP BETWEEN EXPORTS AND DEFLATED ANNUAL GROWTH RATE.

ANNUAL DEFLATED GROWTH RATE	NUMBER OF FIRMS				PERCENTAGES			
	- 1.5% to + 1%	1.1 - 2%	MORE THAN 2%	Total	- 1.5% to + 1%	1.1% - 2%	MORE THANN 2%	Total
NON-EXPORTING	15	16	16	47	51.7%	64.0%	57.1%	57.3%
EXPORTING	14	9	12	35	48.3%	36.0%	42.9%	42.7%
TOTAL	29	25	28	82	100.0%	100.0%	100.0%	100.0%

$\chi^2_2 = 0.828$ $\gamma = -0.077$

E = SPECIAL PROBLEMS

TABLE E-1 : RELATIONSHIP BETWEEN EXPORTATION AND GRANTING OF MANUFACTURING FRANCHISES TO FOREIGN FIRMS.

ENTERPRISES TO FOREIGN FIRMS	NUMBER OF FIRMS			PERCENTAGES		
	YES	NO	Total	YES	NO	Total
NON-EXPORTING	4	61	65	23.5%	55.0%	50.8%
EXPORTING	13	50	63	76.5%	45.0%	49.2%
TOTAL	17	111	128	100.0%	100.0%	100.0%

$\chi_2^2 = 5.825$ $\gamma = -0.597$

TABLE E-2 RELATIONSHIP BETWEEN EXPORTS AND DIRECT INVESTMENTS ABROAD.

DIRECT INVESTMENTS	NUMBER OF FIRMS			PERCENTAGES		
	YES	NO	Total	YES	NO	Total
NON-EXPORTING	4	74	78	21.1%	59.7%	54.5%
EXPORTING	15	50	65	78.9%	40.3%	45.5%
TOTAL	19	124	143	100.0%	100.0%	100.0%

$\chi_2^2 = 9.914^*$ $\gamma = -0.695$

* COEFFICIENT SIGNIFICANT AT A CONFIDENCE LEVEL OF 0.05

APPENDIX VII

GROWTH RATE OF THE EIGHT INDUSTRIES IN THE SAMPLE

INDUSTRIES	GROWTH RATE OF INDUSTRY IN % (1)	AVERAGE GROWTH RATE OF SAMPLE PER INDUSTRY	
		REGULAR % (2)	DEFLATED % (3)
1 - RUBBER	15.01	16.46	1.10
2 - (RAW METALS) NON-FERROUS	5.79	15.99	2.76
3 - MACHINERY	8.33	10.48	1.26
4 - AIRCRAFT & PARTS	2.96	6.63	2.24
5 - ELECTRIC APPLIANCES	9.00	16.38	1.82
6 - OIL & COAL	3.74	16.52	4.42
7 - PHARMACEUTICALS	10.63	11.48	1.08
8 - OTHER CHEMICAL PRODUCTS	5.22	9.22	1.77

TECHNOLOGICAL INNOVATION STUDIES PROGRAM

PROGRAMME DES ÉTUDES SUR LES INNOVATIONS TECHNIQUES

REPORTS/RAPPORTS

1. Litvak, I.A. and Maule, C.J., Carleton University. **Canadian Entrepreneurship: A Study of Small Newly Established Firms.** (October 1971)

2. Crookell, H., University of Western Ontario. **The Transmission of Technology Across National Boundaries.** (February 1973)

3. Knight, R.M., University of Western Ontario. **A Study of Venture Capital Financing in Canada.** (June 1973)

4. Little, B., Cooper, R.G., More, R.A., University of Western Ontario. **The Assessment of Markets for the Development of New Industrial Products in Canada.** (December 1971)

5. MacCrimmon, K.R., Stanbury, W.T., Bassler, J., University of British Columbia. **Risk Attitudes of U.S. and Canadian Top Managers.** (September 1973)

6. Mao, J.C.T., University of British Columbia. **Computer Assisted Cash Management in a Technology-Oriented Firm.** (March 1973)

7. Tomlinson, J.W.C., University of British Columbia. **Foreign Trade and Investment Decisions of Canadian Companies.** (March 1973)

8. Garnier, G., University of Sherbrooke. **Characteristics and Problems of Small and Medium Exporting Firms in the Quebec Manufacturing Sector with Special Emphasis on Those Using Advanced Production Techniques.** (August 1974)

9. Litvak, I.A., Maule, C.J., Carleton University. **A Study of Successful Technical Entrepreneurs in Canada.** (December 1972)

10. Hecht, M.R., Siegel, J.P., University of Toronto. **A Study of Manufacturing Firms in Canada: With Special Emphasis on Small and Medium Sized Firms.** (December 1973)

11. Little, B., University of Western Ontario. **The Development of New Industrial Products in Canada. A Summary Report of Preliminary Results, Phase 1.** (April 1972)

12. Wood, A.R., Gordon, J.R.M., Gillin, R.P., University of Western Ontario. **Comparative Managerial Problems Early Versus Later Adoption of Innovative Manufacturing Technologies: Six Case Studies.** (February 1973)

13. Globerman, S., York University. **Technological Diffusion in Canadian Manufacturing Industries.** (April 1974)

14. Dunn, M.J., Harnden, B.M., Maher, P.M., University of Alberta. **An Investigation Into the Climate for Technological Innovation in Canada.** (May 1974)

15. Litvak, I.A., Maule, C.J., Carleton University. **Climate for Entrepreneurs: A Comparative Study.** (January 1974)

16. Robidoux, J., Garnier, G., Université de Sherbrooke. **Factors of Success and Weakness Affecting Small and Medium-Sized Manufacturing Businesses in Quebec, Particularly those Businesses Using Advanced Production Techniques.** (December 1973) (Available in French)

17. Vertinsky, I., Hartley, K., University of British Columbia. **Project Selection in Monolithic Organizations.** (August 1974)

18. Robidoux, J., Université de Sherbrooke. **Analytical Study of Significant Traits Observed Among a Particular Group of Inventors in Quebec.** (August 1974) (Available in French)

19. Little, B., University of Western Ontario. **Risks in New Product Development.** (June 1972)

20. Little, B., Cooper, R.G., University of Western Ontario. **Marketing Research Expenditures: A Descriptive Model.** (November 1973)

21. Little, B., University of Western Ontario. **Wrecking Ground for Innovation.** (February 1973)

22. Tomlinson, J.W.C., University of British Columbia. **Foreign Trade and Investment Decisions of European Companies.** (June 1974)

23. Little, B., University of Western Ontario. **The Role of Government in Assisting New Product Development.** (March 1974)

24. Cooper, R.G., McGill University. **Why New Industrial Products Fail.** (January 1975)

25. Charles, M.E., MacKay, D., The CERCL Foundation. **Case Studies of Industrial Innovation in Canada.** (February 1975)

26. Hecht, M.R., University of Toronto. **A Study of Manufacturing Firms in Canada: With Emphasis on Education of Senior Officers, Types of Organization and Success.** (March 1975)

27. Litvak, I.A., Maule, C.J., Carleton University. **Policies and Programmes for the Promotion of Technological Entrepreneurship in the U.S. and U.K.: Perspectives for Canada.** (May 1975)

28. Britney, R.R., Newson, E.F.P., University of Western Ontario. **The Canadian Production/Operations Management Environment: An Audit.** (April 1975)

29. Morrison, R.F., Halpern, P.J., University of Toronto. **Innovation in Forest Harvesting by Forest Products Industries.** (May 1975)

30. Mao, J.C.T., University of British Columbia. **Venture Capital Financing for Technologically-Oriented Firms.** (December 1974)

31. Tomlinson, J.W.C., Willie, C.S., University of British Columbia. **Guide to the Pacific Rim Trade and Economic Data Base.** (September 1975)

32. Ondrack, D.A., University of Toronto. **Foreign Ownership and Technological Innovation in Canada: A Study of the Industrial Machinery Sector of Industry.** (July 1975)

33. Mao, J.C.T., University of British Columbia. **Lease Financing for Technology Oriented Firms.** (July 1975)

34. Watson, J.A., University of Alberta. **A Study of Some Variables Relating to Technological Innovation in Canada.** (June 1975)

35. Sheehan, G.A., Thain, D.H., Spencer, I., University of Western Ontario. **The Relationships of Long-Range Strategic Planning to Firm Size and to Firm Growth (Ph.D. Thesis).** (August 1975)

36. Killing, J.P., University of Western Ontario. **Manufacturing Under Licence in Canada (Ph.D. Thesis).** (February 1975)

37. Richardson, P.R., University of Western Ontario. **The Acquisition of New Process Technology by Firms in the Canadian Mineral Industries (Ph.D. Thesis).** (April 1975)

38. Globerman, S., York University. **Sources of R & D Funding and Industrial Growth in Canada.** (August 1975)

39. Cooper, R.G., McGill University. **Winning the New Product Game.** (June 1976)

40. Hanel, P., University of Sherbrooke. **The Relationship Existing Between the R & D Activity of Canadian Manufacturing Industries and Their Performance in the International Market.** (August 1976)

41. Wood, A.R., Elgie, R.J., University of Western Ontario. **Early Adoption of Manufacturing Innovation.** (1976)

42. Cooper, R.G., McGill University. **Project Newprod: What Makes a New Product a Winner?** (July 1980) An Empirical Study. Available at $10.00/copy. Send all orders payable to: Quebec Industrial Innovation Centre, P.O. Box 6079, Station A, Montreal, Quebec, H3C 3A7.

43. Goode, J.T., University of British Columbia. **Japan's Postwar Experience with Technology Transfer.** (December 1975)

44. Knoop, R., Sanders, A., Concordia University. **Furniture Industry: Attitudes Towards Exporting.** (May 1978)

45. Peitchinis, S.G., University of Calgary. **The Effect of Technological Changes on Educational and Skill Requirements of Industry.** (September 1978)

46. Marfels, C., Dalhousie University. **Structural Aspects of Small Business in the Canadian Economy.** (May 1978)

47. Wright, R.W., University of British Columbia. **Study of Canadian Joint Ventures in Japan.** (1977)

    Tomlinson, J.W.C., Thompson, M., **Mexico.** (1977)

    Tomlinson, J.W.C., Hills, S.M., **Venezuela and Columbia.** (1978)

    Tomlinson, J.W.C., **Brazil.** (1979)

48. Chicha, J., Julien, P.A., Université du Québec. **Les Stratégies de PME et leur Adaptation au Changement.** (Avril 1978) (Available in English)

49. Vertinsky, I., Schwartz, S.L., University of British Columbia. **Assessment of R & D Project Evaluation and Selection Procedures.** (December 1977)

50. Dhawan, K.C., Kryzanowski, L., Concordia University. **Export Consortia: A Canadian Study.** (November 1978) Available at $15.00/copy. Send all order payable to: Dekemco Ltd., Box 87, Postal Station H, Montreal, Quebec, H3G 2K5.

51. Litvak, I.A., Maule, C.J., Carleton University. **Direct Investment in the United States by Small and Medium Sized Canadian Firms.** (November 1978)

52. Knight, R.M., Lemon, J.C., University of Western Ontario. **A Study of Small and Medium Sized Canadian Technology Based Companies.** (September 1978)

53. Martin, M.J.C., Scheilbelhut, J.H., Clements, R., Dalhousie University. **Transfer of Technology from Government Laboratories to Industry.** (November 1978)

54. Robidoux, J., University of Sherbrooke. **Study of the Snowmobile Industry in Canada and the Role that Technological Innovation has Played in Its Economic Performance.** (English Summary only). (Available in French)

55. More, R.A., University of Western Ontario. **Development of New Industrial Products: Sensitivity of Risk to Incentives.** (January 1979)

56. Peterson, R., York University. **A Study of the Problems Brought to the Attention of the Business Student Consulting Teams Sponsored by the Ontario Government's Small Business Assistance Programme.** (February 1979)

57. Cooper, R.G., McGill University. **Project Newprod: What Makes a New Product a Winner?** (July 1980) An Empirical Study. Available at $10.00/copy. Send all order payable to: Quebec Industrial Innovation Centre, P.O. Box 6079, Station A, Montreal, Quebec, H3C 3A7.

58. Farris, G.F., York University. **Comments on the Course: Management of Creativity and Innovation.** (February 1979)

59. Smith, J.G., McGill University. **The Renewable Energy Business Sector in Canada: Economic Prospects and Federal Government Initiatives.** (May 1979)

60. Tomlinson, J.W.C., University of British Columbia. **Cross Impact Simulation of the Joint Venture Process in Mexico.** (December 1978)

61. Grasley, R.H., York University. Dermer, J.D., University of Toronto. **The Status of Innovation in the Strategies of Larger Canadian Corporations.** (March 1979)

62. Kubinski, Z.M., University of Calgary. **The Small Firm in the Albertan Oil and Gas Industry.** (February 1979)

63. Scott, D.S., Blair, R.M., University of Waterloo. **The Technical Entrepreneur. Inventions, Innovations & Business.** (1979) Available at $18.95/copy. Send all orders payable to: Fitzhenry & Whiteside Limited, 150 Lesmill Road, Don Mills, Ontario, M3B 2T5.

64. Kolodny, H.F., University of Toronto. **Sociotechnical Study of Productivity and Social Organization in Mechanical Harvesting Operations in the Canadian Woodlands.** (May 1979)

65. Barth, R.T., University of British Columbia. **A Directory of Research on Research.** (May 1979)

66. McMullan, W.E., University of Calgary. **Development of a Course on Innovation and Entrepreneurship.** (September 1979)

67. Peitchinis, S.G., University of Calgary. **Technological Changes and the Demand for Skilled Manpower in Canada.** (January 1980)

68. Peitchinis, S.G., Assisted by: MacDonald, E., University of Calgary. **The Attitude of Trade Unions Towards Technological Changes.** (April 1980)

69. Peitchinis, S.G., University of Calgary. **Technological Changes in Banking and their Effects on Employment.** (January 1977)

70. Clarke, T.E., Laurie, G., Peterson, R., Pieczonka, W.A., TIME. **Proceedings of the T.I.M.E. (Technological Innovation Management Education) for Canada Workshop.** (September 29 & 30, 1979)

71. Palda, K., Pazderka, B., Queen's University. **Background to a Target: An International Comparison of the Canadian Pharmaceutical Industry's R & D Intensity.** (July 1980)

72. Kirpalani, V.H., Concordia University. MacIntosh, N.B., Queen's University. **Small Firm International Effectiveness: An Exploratory Survey.** (June 1980)

73. Bhattacharyya, S.K., Assistance of: Hallett, P.H., Bhattacharyya, R.. **An Assessment of Market Potential for Intermediate Capacity Transit System in North America.** (July 1980)

74. Ondrack, D.A., University of Toronto. **Innovation and Performance of Small and Medium Firms: A Re-analysis of Data on a Sample of Nineteen Small and Medium Firms in the Machinery Industry.** (May 1980)

75. Abdel-Malek, T., University of Saskatchewan. **Canadian Direct Investment in Western Europe.** (August 1980)

76. Peitchinis, S.G., University of Calgary. **Technological Changes and the Sectoral Distribution of Employment.** (February 1980)

77. Crozier, J.E., McMaster University. **A Survey to Identify the Attitudes and Awareness of Numerical Control Users to CAD/CAM Technology and the Technological and Economic Strengths and Weaknesses of Machine Tool Part Programming.** (November 1980)

78. Peitchinis, S.G., University of Calgary. **The Introduction of Computer-Aided Design/Computer-Aided Manufacturing CAD/CAM Systems and their Employment Implications.** (September 1980)

79. Hewitt, G.K., Concordia University. **R & D in Selected Canadian Industries: The Effects of Government Grants and Foreign Ownership.** (January 1981)

80. Litvak, I.A. and Maule, C.J., Carleton University. **Entrepreneurial Success or Failure - Ten Years later. A Study of 47 Technologically Oriented Enterprises.** (October 1980)

81. Adams, P.F., University of Alberta. **Development of a course: "Initiation of Technology Based Enterprises".** (April 1981)

82. Meincke, P.P.M., University of Prince Edward Island. **A Preliminary Study to Determine the Feasibility of Establishing an Industrial Innovation Centre on Prince Edward Island.** (March 1981)

83. Wills, R.M. **The International Transfer and Licensing of Technology in Canada.** (February 1982)

84. Ash, S.B., University of Western Ontario, Quelch, J.A., Harvard University. **The New Videotex Technology and Its Impact on Retailers in Canada.** (August 1982)

Veuillez faire parvenir votre demande à PEIT:
Please forward your request for TISP reports to:

Program Manager
Technological Innovation Studies Program
Technology Branch (61)
Department of Industry, Trade and Commerce
235 Queen Street
Ottawa, Ontario CANADA
K1A 0H5

Revised September 1982