

THE ADOPTION OF EXPORT AS AN INNOVATIVE STRATEGY

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〈Abstract〉

This research identifies a typical form of the exporting adoption process regarding two dimensions—the initiating force and the rationality of the export adoption process. It was hypothesized, first, for this study that, in the export innovation adoption situation, the adoption process would be initiated more often by internally perceived problems or needs rather than by the passively received information about the innovation: exporting. A second major hypothesis took the view that the export adoption process was more rational than nonrational. Third, using various instruments—including Hage and Aiken's index—we measured the organizational structural characteristics of 35 Nebraska exporting manufacturers. The innovation-oriented and nonrational export adoption processes proved to be

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the more common in this group.

Introduction

This article reports on a study of the innovation adoption process in industrial firms and deals with the adoption of a marketing strategy—that is, a decision to adopt a strategy of export. Exporting is treated here as an innovation. Thirty-five small Nebraska exporting manufacturers were approached to determine if their decision process in adopting an export extension to their marketing program was: rational or nonrational; a response to a problem or opportunity or a response to outside information; and if descriptive variables—such as age, size, etc.—were at all relevant. This work is different from prior studies both of the innovation diffusion process and of exporting because it brings diffusion theory to bear on a centuries old marketing strategy—exporting—which is being rediscovered by many U.S. manufacturers.

Related Export Research

There has been one prior study which viewed the export adoption process from the perspective of diffusion of innovation theory. That study, done by Simmonds and Smith in Great Britain, was essentially exploratory, and was based on an examination of nine companies that had begun exporting between 1960 and the time of the research (ca. 1967).¹⁾ Although there was no statistical analysis on which to base conclusions, the researchers suggested that the stimulus to begin exporting was likely to originate outside of the firm—i.e., as the result of efforts by change agents. A primary purpose of our research was to look more closely at the initiating force for exporting.

Bilkey and Tesar have recently developed a model of the export development process.²⁾ In that model management is either: not exporting, filling unsolicited export orders, or exploring the feasibility of

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1. Kenneth Simmonds and Helen Smith, "The First Export Order: A Marketing Innovation," *British Journal of Marketing*, Summer 1968, pp. 93-100.
 2. Warren Bilkey and George Tesar, "The Export Behavior of Smaller Wisconsin Manufacturing Firms," *Journal of International Business Studies*, Spring/Summer 1977, pp. 93-98.

exporting in stages one through three. The critical stage is stage four when the firm begins to export (in the model, on an experimental basis) because at this stage a company has decided implicitly or explicitly to make a commitment to exporting. From the perspective of the innovation diffusion process this stage can be regarded as "adoption."

In this article the focus is on the processes leading up to adoption, in particular the processes that would occur in stage three (e.g., exploring the feasibility) of the Bilkey Tesar model, and the initiating force for this third stage.

The research in this article also relates to a recent export model published by Johanson and Vahlne.³⁾ That model attempts to explain how and why a firm will increase its foreign market commitment. The model assumes various levels of incremental corporate commitment to a particular markets, and to foreign markets in general. Consistent with the Johanson-Vahlne model is a view that the adoption of export is a decision to make an initial international commitment for many firms. Repeatedly in the Johanson-Vahlne work there is reference to an assumption that decisions to make a commitment are initiated either by knowledge of problems or awareness of opportunities.⁴⁾ In the research presented in this article, one of the major findings is the relatively greater importance of awareness of opportunities for innovation—rather than the analysis of problems—as an initiating force in export adoption.

Related Innovation Diffusion Research

It was not until the early 1960s that marketing emerged as an additional innovation diffusion research discipline.⁵⁾ Since then the great preponderance of diffusion research within marketing has focused on

3. Jan Johanson and Jan-Erik Vahlne, "The Internationalization Process of the Firm—A Model of Knowledge Development and Increasing Foreign Market Commitments," *Journal of International Business Studies*, Spring/Summer 1977, pp.23-32.
4. *Ibid.*, p.27.
5. Everett M. Rogers and Floyd Shoemaker, *Communication of Innovation* (New York: The Free Press, 1971), p.68.

individual consumers, whereas organizations and enterprises as potential innovation adopters have been largely ignored. According to John A. Czepiel, the question of how innovations are diffused in an organizational or corporate situation is still unanswered.⁶⁾

Existing industrial innovation diffusion studies, although they are limited in number, share certain characteristics. First, these studies were done mainly by economists, particularly during the 1950s and early 1960s. They have taken the view that the diffusion of innovations among industrial firms is the function of the economic advantage of the innovation and the economic situation of the potential adopters.⁷⁾

Noneconomic factors possibly related to innovation diffusion, therefore, have failed to receive research attention. Second, economists have been concerned almost exclusively with technological innovations which might reduce costs, if adopted.⁸⁾ Innovations such as new services, new marketing strategies, and new market opportunities have seldom been researched. Third, the majority of innovation studies done in industrial settings have focused on the correlations between early adoption and selected organizational characteristics.⁹⁾ Finally, although the typical innovation adoption process of the business organization was present in all studies, it has not been explored in its own right.

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6. John A. Czepiel, "The Diffusion of Major Technological Innovation in a Complex Industrial Community: An Analysis of Social Processes in the American Steel Industry" (Ph.D. dissertation, Northwestern University, 1972), p.3.
 7. See, for example, Edwin Mansfield, *The Economics of Technological Change* (New York: W.W. Norton, 1968).
 8. C.F. Carter and B.R. William, "The Characteristics of Technically Progressive Firms," *Journal of Industrial Economics* 7(March 1959), pp.87-104; Edwin Mansfield, "Technical Change and Rate of Innovation," *Econometrica* 29(October 1961), pp. 741-66; Jacob Schmookler, *Invention and Economic Growth* (Cambridge: Harvard University Press, 1966).
 9. Carter and William, "The Characteristics of Technically Progressive Firms": Mansfield, "The Speed of Response of Firms to New Techniques," *Quarterly Journal of Economics* 77(May 1963), pp. 290-311.

The Problem

The purpose of this study was to explore a typical form of the export innovation adoption process as used by business firms. The specific questions which provided the primary focus for this study were.

- (1) Would an export adoption process be initiated typically by problem perception (problem-oriented adoption process or POAP)? Or, would it be typically initiated by awareness of the innovation (innovation-oriented adoption process or IOAP)?
- (2) Is the export adoption decision process rational (RAP) or nonrational (NRAP)?
- (3) Are there any discernible differences in organizational attributes between firms using different forms of adoption process?

Export Rationale

Prior research has implicitly recognized the decision-making dichotomies that have been stated in the first two problems listed. That is, a firm can decide to begin to export because it recognizes a corporate need that can be met. Thereafter, management finds out more about exporting from outside sources. The initiating force, however, is internal to the firm. Companies may also be stimulated to consider exporting by some activity or event that originates outside of the firm. U.S. Department of Commerce programs are such potential stimulants, as are the programs of District Export Expansion Councils, and local trade clubs. Unsolicited orders also are representative of such outside events that stimulate action on the part of a company. To date those who have sought to encourage exporting have hoped that outside stimulation would be effective; that is, that export decisions are likely to be "innovation-oriented" rather than "problem-oriented." This research tests that assumption.

Because adopting an export strategy is a potentially costly decision, rationality on the part of corporations as they begin to export has been assumed. This assumption is particularly apparent in the availability of advice from banks, consultants, the Department of Commerce, state departments of economic development, and others. But, while it is

implicitly assumed, rationality on the part of corporations as they enter exporting is not necessarily intellectually accepted by those who encourage the adoption of an export strategy. There are too many instances of companies entering export on almost an impulsive basis, without taking advantage of free and low cost assistance that could save time and money. This research looks empirically at the question of rationality vs. nonrationality in the export decision-making process.

Diffusion of Innovation Theory Rationale

Among innovation researchers, it has been widely accepted until recently that diffusion of an innovation is the result of social interaction between knowers and non-knowers of the innovation.¹⁰ Therefore, at a micro level, a potential adopter always receives the initial information about the innovation from an external source and thus the social relationship between two parties has a critical impact on the adoption process. Social contact is the basis for awareness and traditional thought on innovation adoption processes—i.e., that innovation is always initiated by awareness. In addition, innovation researchers also have shared the notion that the decision-making process of an innovation adoption is rational because it involves careful consideration of alternatives and consequences, as evidenced by the decision stage termed “evaluation.”

These views of rationality and awareness initiation have been challenged recently by Rex Campbell.¹¹ According to the new view, the adoption process can be initiated either by knowledge of the innovation that has been received passively, or on the other hand, by social contact, resulting in the traditional awareness sequence. An innovation adoption decision-making process can also be either rational or nonrational.

Given Campbell's view, what then would be the more common

10. Everett M. Rogers, *Communication of Innovations* (New York: The Free Press, 1962), pp. 305-7.

11. Rex R. Campbell, “A Suggested Paradigm of the Individual Adoption Process,” *Rural Sociology* 31 (December 1966), pp.458-66.

form of the export adoption process? Would it be predominantly rational or nonrational? Would it be awareness-initiated or problem-initiated?

There is some research evidence within the marketing discipline from which the major hypothesis (i.e., that problem-initiation is a dominant characteristic of an export adoption process) was developed. This research evidence, which suggests that problem-initiated adoption in industrial firms may be very important, includes: (1) formalized search for a performance gap or problem with the aid of such tools as planning and control;¹²⁾ (2) the consistency of a problem-oriented adoption process;¹³⁾ (3) lack of interaction among industry members, therefore minimizing chances for getting information from an external source;¹⁴⁾ and (4) the fact that the export idea, which was employed in this study as an innovation, is not revolutionarily new, thus resulting in limited exposure by word of mouth.¹⁵⁾

Hypotheses

The following hypotheses were formulated for testing:

1. Among export adopting firms, the POAP is more common than the IOAP.
2. Among export adopting firms, the RAP is more common than the NRAP.
3. There are differences between the POAP firms and the IOAP firms, and between the RAP firms and the NRAP firms in terms of the size and the age of the firms, characteristics of the decision group members, and their perception of the business environment.

The following alternative adoption processes have been hypothesized

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12. Anthony Downs, *Inside Bureaucracy* (Boston: Little, Brown and Company, 1966), p.191.
 13. James F. Engel, David D. Kollat, and Roger D. Blackwell, *Consumer Behavior* (New York: Holt, Rinehart and Winston, Inc., 1973), p.216.
 14. Frederick E. Webster, Jr., "Informal Communication in Industrial Markets," *Journal of Marketing Research* 7 (May 1970), pp.186-9.
 15. Frederick E. Webster, Jr. *Marketing Communications: Modern Promotional Strategy* (New York: Ronald Press, 1971), p.115.

to exist:

(1) *Problem-oriented adoption process (POAP)* An adoption process in which the initiating force is one or a combination of interrelated problems such as: mature product, increased competition within the domestic market, decreasing sales or profit, definite desire for market expansion based on a long-term corporate expansion plan, or other comparable problems or needs as perceived by one or more of the decisionmakers.

(2) *Innovation-oriented adoption process (IOAP)* An adoption process in which the initiating force is either precise knowledge of the existence of a market opportunity in a foreign market for the brand or product, or gaining technical knowledge of exporting. The information on the existence of the market opportunity or export technique may be passively received from other firms, governmental agencies, banks, middlemen, or potential buyers in foreign countries.

(3) *Rational adoption process (RAP)*. An adoption process in which the decisionmakers use a wider variety of more authoritative sources of information; both utilize and value planning and deliberation; keep more complete records; and give specific and economically sound justifications for taking action.

(4) *Nonrational adoption process (NRAP)*. An adoption process for which the decision-makers use less authoritative and less varied sources of information; keep less complete records; neither use nor value much planning or deliberation; and do not or cannot give economically sound justifications for actions taken.

Defintion of Terms

The following definitions were given to the key terms:

Exporting. Exporting is the process of marketing to foreign countries other than Canada. Export distribution can be made (1) through an export representative (such as a combination export management firm) or other types of agents to which the firm in question delegates foreign sales responsibility, (2) by dealing directly with customers in a foreign country, or (3) by selling through a merchant middleman who buys

for his own account and exports at least a part of his purchases. For this study, only alternatives (1) and (2) were considered as export sales, since under alternative (3) clearly defined management responsibility for exports is sometimes not created.

Adoption of exporting. Adoption of exporting is an organized decision to make use of export sales as an integral part of the marketing strategy. Exporting is considered to be adopted when a manufacturer both attitudinally and behavior ally commits itself to export sales. A mechanical response to an order from a foreign buyer, therefore, may not constitute an adoption of exporting unless the firm demonstrates the evidence of attitudinal and behavioral commitment to it.

Adoption process. The export adoption process is a discernible and organized decision process which includes a series of subdecisions made toward the assignment of the responsibility for the export operation.

PROCEDURE

This study was based on the data collected from 35 Nebraska-based manufacturing exporters. Researchers of export decision groups have often been plagued with certain operational difficulties. First, it was difficult to locate the decision participants. Second, even if the decision participants were identified, it was not easy to determine the extent to which each participant contributed to the overall decision outcome. In the present study the president of each company was asked to identify the actual decision participants rather than arbitrarily taking top level executives as the decision participants. The second difficulty, however, remained unsolved. Two criteria were established for the presidents to help them select respondents within the firm : (1) the respondent had participated in the export adoption decision; and (2) the respondent was a high-level officer when the export adoption decision was made by the firm. The largest number of decision-makers in a firm was five. In 23 firms, or 66 percent, the export decision was made by one executive member, indicating the overall small size of the sample firms. On the average, the sample firms had 1.4 export decision-makers.

A questionnaire to be filled out by the presidents was mailed to each of the firms that had, by phone conversation, indicated their willingness to cooperate. We included questions concerning the firm's demographic status; questions designed to identify the initiating force in the adoption process; questions developed to determine the level of rationality; and a question asking the identity of the decision group members. Later, a questionnaire was mailed to each export decision participant identified by the president. It contained questions designed to measure the characteristics of: (1) the decision group members, (2) organizational structure, and (3) the organizational environment.

Information on the choice of the export adoption process by individual firms was obtained by asking the respondent to select, from two general decision processes, the one which most nearly represented that of his firm when it initially made the export adoption decision. The following descriptions were offered:

1. We heard of the existence of a potential foreign market, or we learned of how-to-export techniques or of export opportunities. Later, further information about a particular markets for our product was collected. Along the way, export responsibility became assigned, or it was recognized that exporting was a collective responsibility.
 2. For some reason (such as increased competition in the existing market; maturity of product; excess production capacity; long-term corporate expansion plan; surplus capital; or, change in management), we perceived needs for the development of new markets. Later, while we were examining the alternative solutions, we determined that developing a foreign market was a viable one. Then, someone was given the responsibility for developing the international opportunity, or it was recognized that exporting was a collective responsibility.
- By using the four dimensions of rationality suggested by Dean,

16. Alfred Dean, Herbert A. Aurback, and C. Paul Marsh, "Some Factors Related to Rationality in Decision Making Among Farm Operators," *Rural Sociology* 23 (1958), pp. 121-35.

Aurback, and Marsh,¹⁶ the authors developed a rationality measurement index. The index was originally composed of nine questions, of which five were open-ended and four were multiple forced-choice type. This questionnaire was pretested, using five exporting manufacturers representing various industries. Following the pretesting, response categories were developed for the open-ended questions. Each of the nine questions reflected one or more of four rationality dimensions. The rationality weights were assigned to each response by a panel of judges that consisted of such exporting specialists as an international banker, a foreign freight forwarder, a state industrial export consultant, and a local university research staff member.

IMPLICATIONS OF FINDINGS

In general, the two major hypotheses regarding the importance of the POAP and NRAP were substantiated by this study, whereas most of the organizational characteristics investigated were found to be unrelated with the forms of export adoption process. This may be an indication that the choice of a particular form of adoption process is specific to the factors other than the characteristics of a firm. For instance, it may be specific to the innovations to be adopted. We have summarized our findings and their implications in the following discussion.

Hypothesis 1

Among export adopting firms, the POAP is more common than the IOAP. Twenty-four firms identified their adoption process as being innovation-oriented, and there were 11 firms whose adoption process was found to be problem-oriented. The value of chisquare computed was 4.83. This was significant at the .007 level. Contrary to the research hypothesis, IOAP was a significantly more common form of exporting adoption process than POAP among Nebraska manufacturers. This may have been due to the availability of various change agents (government agencies, banks, and other export agencies), since formal interfirm communication was apparently rare in the sample. On the

informal level there may have been some interfirm communication about exporting, but such information would likely have had source credibility problems. On a local basis it would almost always have had to come from an executive in a different industry, and because most local exporters have not been highly successful, informal talks about exporting would probably not be motivational. Change agents have been active in Nebraska and their work seems to have resulted in a high incidence of the innovation-oriented adoption process.

EXHIBIT 1
Relative Popularity Between IOAP and POAP

	IOAP	POAP	X ²	df	prob.
No. of firms	24	11	4.83	1	.007

The high proportion of IOAP firms is encouraging to those who seek to gain new interest in exporting through the use of programs that provide awareness about international marketing opportunities and operating procedures to nonexporting manufacturers. Although certainly not all companies that become aware of export are responsive to the new information, it does have a tangible impact on the majority of new exporters in being the adoption initiating force.

But whereas new information about exporting was the initiating force for an export commitment in 24 out of 35 firms in the sample, a substantial minority of exporting firms initially considered export for reasons that were apparently independent of outside influence. The various export promotion agencies cannot hope to have much influence in firms which make decisions in a similar fashion in the future.

Hypothesis 2

Among export adopting firms, the RAP is more common than the NRAP. The four judges were asked to rate the adoption process of each sample company on a seven-point scale; one being extremely nonrational and seven being extremely rational. Their judgment was made on the basis of nine pieces of evidence shown on the rationality

index (the actions taken or the subdecisions made toward the exporting adoption). The four judges' scores were averaged for a company rationality score. An export adoption process which was rated higher than four was considered to be rational and an adoption process that received a score lower than four was considered to be nonrational. No company received a rationality score of exactly four. Through this process, the adoption processes for 24 firms were determined to be nonrational, whereas there were 11 firms whose adoption processes were found to be rational.

EXHIBIT 2
Relative Popularity Between RAP and NRAP

	RAP	NRAP	X ²	df	prob.
No. of firms	11	24	4.83	1	.007

The value of chi-square computed was 4.83. This was significant at the .007 level. It was concluded that NRAP was significantly more common than RAP among Nebraska manufacturers.

Because the proportion of innovation-oriented adoption process to problem-oriented adoption process firms was the same as the proportion of nonrational adoption process firms to rational adoption process firms, a test was run to see if there was a high level of correlation between the two measures. To the contrary, no significant relationship was found.

In order for a decision process to be perfectly rational there must be the existence of a clearly defined goal and the selection of one or a set of alternatives that promise to meet the goal in the most efficient manner as determined by some form of thoughtful analysis. To the extent that most new exporters followed a nonrational decision process, in varying degrees they did not consult with expert authorities; they did not collect much information in either a quantitative or qualitative sense; and they had only vague justifications for getting themselves involved in exporting. This is unsettling information. If the export entry process is more frequently nonrational among firms

that qualify as exporters, one would think that it is even higher among those who have tried and later withdrawn either because of outright failure, or because it turned out to be a different type of experience than had been hoped.

Johanson and Vahlne state that "establishment and performance of a certain kind of operation or activity . . . require both general knowledge and [with respect to a specific country] market-specific knowledge."¹⁷ When making an export decision and having minimal levels of knowledge of export opportunities, procedures, and alternatives, many companies are apparently not taking advantage of free and low cost information available from the many export assistance agencies. There may be several reasons to explain why some firms may move ahead without much rational analysis. For instance, sample firms in this study were small. To the extent that the export decision was made primarily by an entrepreneurial type of president (the decision was in fact made by only the president in 23 firms), there may not have been extensive time available before a decision had to be made. There may have been a naive attraction to the romance of foreign business that resisted careful analysis. There may also have been naive acceptance of export agency assertions that, "the market is out there." On the other hand, research conducted by Simpson found that management may simply have a belief that exporting is a good thing to do, regardless of the particular contribution that it may make to the firm.¹⁸ Any one of these reasons could be sufficient in itself to explain why the majority of firms in their research adopted exporting as an activity under what has been termed a nonrational decision process.

Hypothesis 3

There are differences between the POAP firms and the IOAP firms, and between the RAP firms and the NRAP firms in terms of the size

17. Johanson and Vahlne, "The Internationalization Process of the Firm," p.23.

18. C.L. Simpson, "The Export Decision: An Interview Study of the Decision Process in Tennessee Manufacturing Firms" (Ph. D. dissertation, Georgia State University, Atlanta, Georgia, 1973).

and the age of the firms, characteristics of the decision group members, and their perception of the business environment. Results indicated that there was a significant difference in age between innovation-oriented adoption process firms and problem-oriented adoption process firms. Companies that had adopted exporting through the innovation-oriented adoption process were decidedly younger. The two groups were very much homogeneous in terms of the size of the companies, the characteristics of the decision group members, and the perceived characteristics of the environment. Differences between rational adoption process firms and nonrational adoption process firms were found in the perception of the overall business environment. The overall business environment is a construct that was developed from general attitude scales on two environmental questions: the domestic business environment and the foreign market environment.

CONCLUSIONS

Nearly one-third (31 percent) of the firms under investigation were problem-oriented in adopting an export strategy. It was interesting to note that the ratio of problem-oriented firms was very close to that of an innovation diffusion study by Reynolds.¹⁹ In his study, the problem-oriented adoption process was used by 30 percent of his sample. It also matches closely the 3:6 ratio found in the Simmonds and Smith export study.²⁰ The results of these three studies support Campbell's paradigm (see Note 11) in that for about one-third of respondents the traditional assumption of awareness at the starting point of the adoption process is an incomplete conceptualization. Not all exporting is dependent on change agents. On the other hand, there is now convincing evidence that change agents are critical in about two-thirds of export adoption decisions.

The present study results also strongly supported Campbell's suggestion regarding the importance of the nonrational adoption process.

19. Fred D. Reynolds, "Problem Orientation: An Emerging Dimension of Adoption Research," *Rural Sociology* 36 (June 1971), pp. 215-218.

20. Simmonds and Smith, "The First Export Order."

Nearly 70 percent of the firms responding used the nonrational adoption process in making an export decision. Although nonrational aspects of the organizational decision process have often been observed, the dominance of the nonrational adoption process as found in the present study was quite contradictory to the belief shared by many that industrial decision making is essentially rational. But the magnitude of these findings is possibly affected by the small size of an average Nebraska firm. A typical Nebraska exporter is fairly small and is basically a family operation. For a firm of this type, concepts like an information system, planning, and controlling, which are facilitators of rational decision making, might be inconceivable luxuries. Further, the economic advantage of exporting is difficult to calculate for an export adopting firm. Perhaps this difficulty also helps to explain why this study found a predominance of nonrational adoption behavior.

The size and the age of the firms, characteristics of decision groups, and environmental attributes were investigated to see if these variables differentiated the IOAP firms from the POAP firms and the RAP firms from the NRAP firms in the adoption of export. The company age was found to be a good indicator of choice between the IOAP and the POAP, whereas it was not so for the choice between the RAP and the NRAP. It was found that the IOAP firms were significantly younger than the POAP firms. It seemed that at an earlier stage of the company life cycle, business firms tend to be active in new social interactions and in information seeking. The level of overall business uncertainty or risk, as perceived by the management, must be high during this stage, whereas the company is often handicapped by a limited internal supply of the large amount of information with which the management may reduce the uncertainty or risk.

Perceived export risk, which might otherwise be a major negative consideration, may just be part of a general risk condition which the new firm has learned to live with. This may be why younger firms are not only more innovative in general, but also why their export adoption processes are more often initiated by externally received

information about exporting rather than by internally perceived problems.

The firms investigated perceived that the level of competition at the time of exporting adoption was relatively high, but their perception of change agents and the overall environment was relatively favorable. In the related literature, there has been less agreement among studies regarding these environmental variables. In the present study the RAP firms perceived their overall environment differently from their NRAP counterparts.

LIMITATIONS

This study had several limitations. Primary among these is that it was limited in geographic scope to one state, Nebraska. The Nebraska manufacturers from which the sample was drawn are nearly all under \$50 million in sales with the vast majority having sales no greater than \$5 million. It is not possible to generalize the export-related findings to other geographic areas.

The ability to generalize the findings of this study is also limited to the extent that this study considered only one innovation: exporting. But exporting is unusual as an innovation in that the idea is not totally foreign to the average businessman. It is also unusual because the idea of exporting is an intangible idea rather than an object. Unlike an industrial product, it may be difficult to determine the exact impact of export adoption, and a personalized and specialized information source such as an industrial salesman is not available in export adoption. The firms, therefore, that are considering export adoption often have to take the burden of collecting and personalizing the information. While this study obtained a high rate of response, the absolute number of exporters studied was only 35 since there were not many qualified sample firms that met the criteria set for this study. For any specified difference between means and any significance level, the type 11 error is a function of sample size. In other words, the smaller the sample, the greater the possibility of accepting a null hypothesis when it is, in fact, false.

