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**A Study of
Security Innovations and
Innovators**

by

Akira Iwamura, B.A. (Honours).

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements of the degree of
Master of Management Studies

School of Business
Carleton University

July 7, 1989

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and Research acceptance of the thesis

A Study of
Security Innovations and
Innovators

submitted by Akira Iwamura, B.A. (Honours)
in partial fulfilment of the requirements for
the degree of Master of Management Studies

Thesis Supervisor

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August 22, 1989

Abstract

This thesis explores security innovations and innovators. The study objectives are to classify and to characterize security innovations, to determine the purpose of security innovators generating such innovations, and to identify the significant differences which separate innovators from non-innovators. The results are based on the responses of corporate finance Vice Presidents (or CEO's) of 43 investment houses from all over the world, who were surveyed in February 1989, using self-administered questionnaires.

Findings indicate that there is no consensus among respondents on what constitutes security innovations and how to classify these innovations on the basis of their newness. The reasons for which investment houses generate security innovations are: 1) to protect and to expand the customer base; 2) that they are a profitable/high margin business; 3) for fame or corporate image; and 4) that they are customer driven. The main reasons for not generating security innovations are that these innovations: 1) are time consuming; 2) are risky or uncertain; 3) require experience; and 4) cost too much.

The most significant difference which separates innovative companies is the idea generation process, that is, the idea generation phase, the internal environment or climate with respect to new ideas, and the attitude and the strategy of management in supporting this process. The factors distinguishing innovative companies from others are: 1) that a variety of idea sources, both internal and external, are used for idea generation (i.e., monitor industry, regularly contact customers, etc.); 2) that there exists a specific person or group who is in charge of developing new ideas; 3) that employees at all levels are encouraged to generate new ideas; 4) that techniques to stimulate new ideas are used in the group which is responsible for innovation (e.g., brainstorming); 5) that employees are rewarded by non-monetary means; 6) that the decision to implement and to select innovations is made by a group; 7) that management has an innovation strategy and that it defines the market segment that new security should attract. (Note: the above points are not the case for non-innovative companies.)

A positive relationship was observed between company innovativeness and revenues, the number of full-time employees, and the book value of the asset base, as well as between company innovativeness and strength in the area of underwriting, wholesale brokerage, and risk management.

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Statement of Confidentiality

Due to the nature of much of the information gathered during this study, the identity of the sample firms and their specific responses must remain confidential. The anonymity of the respondents has been ensured as part of the data collection process.

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1. INTRODUCTION

Security innovations, which constitute a major portion of financial innovations, have produced significant changes in capital markets. Miller (1986) claims that the word "revolution" is entirely appropriate for describing the changes in financial institutions and in instruments which have occurred in the past twenty years (See Appendix A). Van Horne (1985) also argues that the last six years have witnessed the greatest number of financial innovations in history, reflecting vitality and other forces of competition (See Appendix A). Miller (1986), Van Horne (1985), and Silber (1983) predict that financial innovations will continue to flourish and to experience noticeable growth.

Parallel to this growth in innovation, there are frequent reports in the financial press about some merchant bankers haphazardly head-hunting for so-called rocket scientists. Some security companies are investing huge amounts of money in information systems. For example, Nomura Securities' investment in their information system from 1983 to 1990 is calculated at more than one hundred billion yen (1 Canadian dollar is approximately one hundred yen). On the other hand, it is possible that high costs have deterred some merchant banks from innovating. For them, it may be better to wait for other companies to generate security innovations and then to just duplicate them. This imitator strategy is consistent with the fact that, in contrast to product innovations, most security innovations have no technological barriers or patents. Furthermore, some financial analysts claim that security innovations take place, in most cases, by accident.

Although many arguments have been raised about the macroeconomic reasons which result in the creation and in the continuing existence of financial innovations, there is hardly any published empirical research on who, why, and how security innovations are created, marketed and maintained. As well, the term "financial innovation" is loosely used; there seems to be no clear definition of what constitutes financial innovations, and

security innovations in particular. Furthermore, there is no research on what makes some investment houses innovate and others not innovate.

2. THE RESEARCH PROBLEM AND THE ORGANIZATION OF THE THESIS

Literature in the area of general innovations suggests that innovation is a key issue for competitiveness among manufacturing firms in the tangible product market. As well, there is substantial literature and research which examines what and how product innovations are created and marketed and by whom.

Literature in the area of financial innovations indicates that one of the causes of financial innovations is competition. Finnerty (1987) argues that increased competition has contributed to the willingness of financial institutions to supply new securities. However, there seems to be no empirical research on security innovators, or on why and how they generate security innovations. Furthermore, the literature does not give any guidelines on what constitutes security innovations or on how they may be categorized to help in conducting empirical research on security innovations and innovators.

This lack of research provides the main impetus for this study, which is to understand the ever-expanding market in security innovations. Such a study would allow practitioners to know whether or not security innovations differ significantly from product innovations and whether or not we can apply what the general innovation literature reveals about attributes, categorizations of innovations, and how innovators manage the generation of innovations. If security innovations are found to be different from non-financial innovations, then how should the management of security innovations differ from that of general innovations?

The purpose of this research is (1) to classify and to characterize security innovations; (2) to determine the reasons provided by security innovators for generating security innovations; and (3) to identify significant differences which separate innovators from non-innovators.

For this research, innovation is defined as "a product perceived as new." This is because "securities" are products rather than ideas, practices, processes, or implementations. Security innovations are defined as "new securities which can be considered as investment contracts used for corporate financing" (Silber 1983).

As there is no clear definition of the term "newness" in the literature, this research evaluates the "newness" of security innovations based on the perceptions of the informed market participants.

This study's emphasis is not only on security innovations but also on security innovators themselves, that is, investment houses which generate security innovations. Hence, this research deals mainly with new securities which can be ascribed to the innovators. In other words, generic innovations (e.g., options, futures, etc.) are excluded from this research.

This thesis contains a further six sections, as well as a number of appendices. The next section will review two categories of literature: literature on financial innovations and that on general innovations. Since there exists virtually no empirical research which specifically addresses the creation, marketing, and maintenance of security innovations, literature in the area of financial innovations will be reviewed. This will help to determine the attributes of security innovations and the purpose of security innovations. In addition, literature in the area of product innovation will be reviewed to examine the general attributes of innovations, the purpose of innovations, the internal and external prerequisite environments for generating these innovations, and management's role in the generation process. This review is necessary for placing security innovations and security innovators within a framework consistent with general innovation research. Following the literature review, section four presents the research questions. Section five discusses the methodology; section six presents the research results and findings.

Finally, section seven provides the summary and elaborates on the implications of the study.

3. LITERATURE REVIEW

As outlined in the previous section, the purpose of this research is (1) to classify and to characterize security innovations; (2) to determine the purpose of generating security innovations; and (3) to identify significant differences which separate innovators from others. However, very little research directly addresses each one of these areas with respect to security innovations. Therefore, literature in the area of financial innovation will be reviewed first, as security innovations form a part of financial innovations. However, financial innovation literature does not provide enough guidance for empirical research. Consequently, a review of the literature in general will follow. Then, all relevant issues from these two areas of literature will be summarized.

The literature will be reviewed in the following order: issues concerning innovations, issues concerning the purpose of generating innovations, and issues of how innovators generate innovations.

3-1 Innovation

It is often claimed that security innovations constitute the major portion of financial innovations. However, there is no consensus on what constitutes financial innovation; hence, security innovation is synonymous with financial innovation for some authors, while others see security innovation as a subset of financial innovation.

Definition of Financial Innovation

There seems to be no distinct definition of financial innovation. Most authors tend to use the term very loosely, as indicated by the following statements: (1) the

changes in financial institutions and instruments (Miller 1986); (2) a new instrument or technique (a Study Group established by the Central Bank of the Group of Ten Countries 1986); (3) a new instrument or practice (Silber 1983); (4) a new product or process (Van Horne 1985); (5) a new security and/or process (Finnerty 1987); and (6) a new product, delivery system, market, organizational form and/or industrial structure (Nomura Research Institutes 1986). Appendix A lists these definitions and related information in tabular form.

Based on the above articles, financial innovation can be summarized as "a new technique, product, process, practice, and/or instrument" or, alternatively, "a new security, delivery system, market, organizational form and/or industrial structure".

Definition of Newness

Although most of the definitions of financial innovations include the term "new", there is, unfortunately, no clear definition of the term "new". Finnerty (1987) claims that just "new" is not enough, that there must be some real value added to the issuing company's shareholders. Miller (1986) argues that financial innovation should not be simply an improvement on a previous product, but should be an unanticipated, unforecastable change, or some kind of a surprise. For purposes of definition, a simple improvement refers to that which could have been, in principle at least, forecasted by extrapolating known past information. However, Miller also admits and suggests that many financial innovations already existed in one form or another for many years before springing into prominence. Van Horne (1985) suggests that, with financial innovations, it is very seldom that anything truly new is introduced. Most innovations typically involve a modification of an existing idea, this idea being either a product or a process.

Financial Innovations in Terms of Patentability

One way to define newness is in terms of patentability, in that patentability can explain crucial differences between financial innovations and other product innovations.

Financial innovations connote an idea or a concept, rather than a material product or a process of manufacture. This is probably the best reason why financial innovations are not normally patentable. The only patent granted for a new security is for PRIME and SCORE, registered by the Americus Shareowner Service Corp. in 1983 (Deshpande and Jog, 1987). It is obviously impossible to describe the idea or concept of a financial innovation. For example, suppose that an innovator (a financial institution) has fully described a new innovative security; it would only be a matter of juggling a single number for another financial institution to make a replica of this product. The "recipe" could be changed minutely on innumerable levels, yet it would in effect be the same as the original patent (e.g., increasing the maturity period by one day while lowering the interest rate by 1/10 of a percent). Hence, innovators are generally unable to patent new innovative securities.

Deshpande and Jog (1987) have given an example of a successful financial innovation which has now been duplicated and which is available under numerous trademarks. The Money Market Preferred Stock (MMP) was first issued by Shearson Lehman Bros. for American Express in August 1984. By June 1986, there were 92 MMP issues outstanding, with a total face value of \$616 billion. However, very similar securities were offered under names such as Dutch-Auction Rate Transferable Securities (DARTS), by Salomon Brothers, and Short Term Auction Rate Preferred (STAR), by First Boston Corporation.

Another reason for not granting a patent for financial innovations is that the market volume, which is crucial for the efficient liquidity function of the security, cannot

be affected by only one innovator. The market, by nature, requires participants. Hence, exclusive control of a financial innovation may actually harm the innovator because of the difficulty of guaranteeing the liquidity of this new security.

Categories of Financial Innovation

Because of these difficulties in defining "financial innovation", approaches to the categorization of financial innovations vary considerably in style and content (See Appendix A).

Silber (1983) categorizes financial innovations in terms of where each of these innovations is used, as follows: (1) Cash Management; (2) Investment Contracts (i. primary market, ii. consumer-type), (3) Market structures; and (4) Institutional Organization (See Appendix A).

From another point of view, Miller (1986) tries to determine the most significant financial innovation in the last twenty years. He defines "successful" and "significant" financial innovations in the following manner. Successful innovations are those which earn an immediate reward for their adopters in the form of tax money saved, that is, in the changing of the tax structure. Significant innovations are those which not only survive but which also stimulate further innovations. These definitions, however, are very ambiguous and are loosely defined.

Summary of Financial Innovation

After having reviewed literature in the area of financial innovations, it is clear that definitions of financial innovation are fuzzy and that categorizations of financial

innovations are created quite randomly. No attempt is made to verify empirically how capital market participants categorize financial innovations.

To put this literature into perspective, a review of literature in the area of general innovation is necessary. Noting that literature in the area of general innovations is more progressive than literature in the area of financial innovation, it is worthwhile reviewing literature on general innovations, with the view of finding guidelines for examining the research questions proposed in this study.

A General Definition of Innovation

An examination of the literature reveals that the term "innovation" presents major definition problems. Each writer or author defines innovation according to his/her own perspective. For example, definitions include: (1) something new (Gobeli and Brown, 1987); (2) an idea, practice, object or material artifact perceived as new (Rogers 1983; Zaltman, Duncan, and Holbek, 1973); (3) an idea perceived new (Rogers, 1968); (4) an idea, product or service perceived to be new (Williams, 1982); (5) the process of generating or discovering and implementing the means which is new (Rickards, 1985; Crawford, 1983; Kamm, 1987); (6) an implementation, adoption, introduction of a new idea, behaviour or procedure (Daft and Becker, 1978; Evan and Black, 1967; Mohr, 1969).

There seems to be general agreement that innovation is "an idea, product, service, process, or implementation" which is perceived as new. Similar to the ambiguity found previously in the area of financial innovation, the term "new" is also not very well defined in this literature.

Definition of Newness

In general, literature dealing with definition of newness is concerned with two points: by whom should innovations be perceived as new; and how new is "new". In other words, it is concerned with how the degree of newness is to be measured.

Rogers (1962 and 1983), Zaltman, Duncan, and Holbek (1973), and Daft and Becker (1978) argue that innovations should be perceived as "new" by any individual or relevant unit (organization or firm) implementing the innovation. On the other hand, Williams (1987) claims that innovation should be perceived as "new" by consumers.

Gobeli and Brown (1987) approve both the producers' view and buyers' view and categorize four types of "newness", as indicated below:

		Producers' view technological change	
		low	high
Buyers' view increased benefit	low	incremental	technical
	high	application	radical

They state that when an item is perceived to be new, by both buyers and producers, it is then regarded as radical, that is, having the highest degree of newness.

It seems that, in general, researchers assume that "newness" is a concept to be interpreted by the adopters or the consumers, while "radicalness" is determined by both the innovators and the adopters. Zaltman, Duncan, and Holbek (1973) go further and classify radicalness "as the degree to which the innovation differs from alternatives including the status quo". Radicalness is strongly linked with risk, novelty, and

creativity. It follows that radicalness is nothing more than one of the subjective concepts that describes how new the "newness" is.

Kamm (1987) tries to explain the degree of newness through the creation of a scale, measuring from 0 to 180 degrees, as follows:

0 degree: does not differ from reference point (same class)

45 degrees: evolution, variations, incremental change, continuous

135 degrees: revolution, reorientation, discrete change, discontinuous

180 degrees: create new reference point (new class).

This 180 degree newness can be termed as radical. This form of measurement is still, as Kamm herself admits, arbitrary and subjective. However, it may help to determine the newness of an innovation. For example, one approach suggested by Kamm is to break down anything new (e.g., a product, such as a computer or a machine) into its major parts, and to try to express a percentage of the new parts to the old parts, hence, expressing the newness of anything as a percentage.

Another way to define newness is by its patentability; if something were not new, it would probably not get patented. Consumer and Corporate Affairs Canada (1987) defines a patentable invention and an unpatentable invention as follows: "A patentable invention is any new and useful process, machine, method of manufacture or composition of matter, or any new and useful improvement thereof, which is not obvious to someone skilled in the particular field. In contrast, unpatentable inventions are an improvement to a known device which would be obvious to a person skilled in the art, a principle, a recipe, a design, a computer program, an idea or a process (or the product of a process) that depends entirely on a person's skill and leads to an ornamental effect." The patent office claims that the inventors must fully describe the invention in order to get a patent.

The alternative to registering a patent is to register a trademark. "A trademark is a word, symbol or picture, or any combination thereof, used to distinguish the goods or services of a person or organization from the goods or services of others in the marketplace." (Consumer and Corporate Affairs Canada (1987)).

If one takes out a patent, it is probably for something new. However, financial innovation, by nature, cannot be patented. Therefore, there is still the problem of defining "newness". It should be noted that a trademark cannot stop others from duplicating a security innovation.

Categories of General Innovation

There exist many classification schemes to define the categories of innovation, the two most important of which are given by Zaltman, Duncan, and Holbek (1973), and by Crawford (1983). Zaltman et al. (1973) argue that it is possible to categorize innovation in terms of the newness, the creativity, the risk, the changes implied, etc. They suggest three innovation types: (1) Programmed and Non-programmed (depending on the degree of anticipation or how much scheduling the individual or organization has done in advance); (2) Instrumental and Ultimate (depending on whether the innovation is an end in itself or whether it is instrumental in achieving other ends); and (3) Routine and Innovative (depending on the radicalness or novelty of the innovation).

Another system of categorization is the demand-pulled/supply-pushed innovation. The argument as to whether the demand is first (demand-pulled) or the supply is first (supply-pushed) is similar to the chicken and egg argument. Crawford (1983) argues that demand-pulled innovations owe their source to marketing and are generated by firms seeking products which help to meet the needs of their chosen or potential customer group; supply-pushed innovations owe their source to research and development and are

generated by technical or scientific breakthrough, hence it does not matter whether they result from a plan or an accident. He does conclude that demand-pulled innovations are more successful than supply-pushed innovations, in general.

Summary of Innovation

Product innovation, therefore, seems to be defined in terms of newness, radicalness, or even patentability. Patentability may permit an easier definition and categorization of product innovation. However, this is not the case for security innovations, which are by nature un-patentable. In literature on financial innovation, defining "newness" seems to be difficult, in the absence of patentability. It may be that empirical research on categorization is easier to define in product innovation literature.

This research will assess whether or not there is a consensus on the definition of security innovations, the newness of security innovations, and the categorization of security innovations. This consensus (or lack thereof) will depend upon the type and the characteristics of respondents of any questionnaire or survey. In the security innovations context, informed market participants are excellent targets for questioning, as they are directly involved in the field and therefore deal with security innovations on a daily basis.

3-2: Reasons for Generating Innovations

The following two sub-sections deal with the literature on innovators. Some of the questions to be asked and answered are: what are the reasons for generating security innovations by innovators? What are the prerequisites for a firm to innovate? What strategies do firms follow to innovate?

First, reasons for generating security innovations will be examined. As before, literature in the area of financial innovations will be reviewed first, followed by a review of literature in the area of general innovation.

Reasons for Generating Financial Innovations

According to financial literature, reasons for generating financial innovations can be summarized as follows: (1) the reduction of transaction costs (Finnerty (1987), Van Horne (1985), Silber (1983)); (2) the reduction of risk (Finnerty (1987), Silber (1983), A Study Group of Central Banks of the Group of Ten Countries (1986)); (3) tax arbitrage (Finnerty (1987), Silber (1983)); (4) the enhancement of liquidity; (5) the increased access to credit suppliers; and (6) the increased access to equity finance (A Study Group of Central Banks of the Group of Ten Countries (1986)). Financial institutions and investment houses can get and maintain their clients by satisfying the demands of both issuers and investors by ways of implementing those functions of financial innovations mentioned above.

Finnerty (1987) claims that financial innovations provide an opportunity for the innovators to solicit business from companies which have traditionally used other investment banks. Frankel and Mann (1986) also suggest that financial innovations cause substantial changes in the profitability of whole categories of financial services, thereby changing the basics of traditional customer relations and traditional product offerings, which together form the foundation for market share rivalry.

Nomura Research Institutes (1986) claims that innovative products, techniques, and systems have been instrumental in substantially improving the revenues and earnings of the investment banking firms employing them. One of the examples given by Nomura is the innovations in the retail delivery system in the central asset account typified by

Merrill Lynch's Cash Management Account (CMA), which combines a margin account, a money market fund, a VISA debit card, and a bank servicing arrangement.

The literature in the area of financial innovations sheds light on only the macroeconomic contributions of financial innovations and some superficial advantages for innovators. However, the literature does not provide empirical research on why security innovators generate or do not generate security innovations. Hence, literature in the area of general innovations which relates to empirical research on security innovations will be reviewed.

Purpose of General Innovation

Various authors have set forth ideas on the purpose of innovations. The reasons cited generally overlap in content, and can be placed into two categories: the contribution to the individual or the firm itself (innovators), and the contribution to society.

(1) The Contribution to the Innovators Themselves: Kamm (1987) summarizes contributions to the unit or the firm implementing the innovations as follows: (1) to improve quality; (2) to reduce cost; (3) to perform a function not previously performed; (4) to enhance attractiveness for the current market; (5) to increase offerings to the current market; (6) to enter a market not currently served; (7) to improve the learning curve (unit cost decreases as experience increases); (8) to enhance economies of scale; (9) to permit the production of better-quality offerings; and (10) to enhance human growth and the potential of employees within the firm. Another reason for innovation is to satisfy the values and aspirations of top management, the dominant coalition, or the quest for prestige (Kamm (1987), Mohr (1969)).

(2) Contribution to Society: It is also important to note that innovation is one important form of organizational responsiveness to its external environment. Kamm (1987) summarizes motives of top management as follows: productivism, philanthropy, progressivism, and ethical idealism. She observes that some managers assume that they should be ethical and proper, as long as they benefit their firm's owner and do no intentional harm to others. Some are philanthropic, and feel obligated to present innovations for the good of society, even if these will result in personal harm or loss. Some of the ethical, idealistic managers also believe that they are primarily responsible to society rather than to their firm's owners. Progressive managers believe that they are as responsible to external societal organizations as they are to their company's owners. It follows that innovations can be generated even if they do not directly promise profits to the firm.

It is also important to note that not all firms are eager to generate innovations. Crawford (1983) explains that there are three types of strategies a firm can choose, namely, pioneering, adaptive, and imitative. Pioneering strategy means doing something for the first time; adaptive strategy is taking something done by a pioneer and trying to improve it in some meaningful way; and imitative strategy means copying an innovation without change. Crawford suggests that each of these strategies can be profitable, if used at the right time. It is interesting to note that he argues that adaptive strategy which is of course a lower risk than pioneering strategy, is riskier than most people think, as a pioneer quite often obtains a permanent advantage. Adaptation frequently requires costly R&D; there may be a patent shutout; and pioneers may be able to enjoy the experience curve. Crawford also points out that imitative strategy is not free from risk either. Some of these arguments are not entirely applicable to security innovations, nevertheless.

Why Some Innovate and Others Do Not

The following examination considers the question of why some investment houses are eager to generate security innovations while others are not. There are several reasons for generating security innovations and a sizeable number for not generating them, as the following lists indicate.

Reasons for Innovating

- (1) To Protect and to Expand the Customer Base:** As mentioned previously, innovators can get and maintain their clients by improving the quality of service, by enhancing attractiveness for the current markets, or by entering markets not currently being served.
- (2) Cost:** Some innovative processes will enable financial institutions to reduce their costs significantly. For instance, computerization has reduced dramatically the delivery cost per security, as well as reducing personnel expenses, through the use of automatic teller machines.
- (3) Customer Drive:** Some security innovations are not generated within the financial institutions but rather on the suggestion or demand of the customers. It follows that if security institutions have no capacity for generating innovations which fit a specific customer need, they will lose this business to a competitor.
- (4) To Enhance Human Growth and Employee Potential Within The Company:** Some security innovations will contribute to the productivity of labour and

to efficiency in the organization. This will enhance job quality and satisfaction, thereby creating a good working environment. It is also true that innovative people will be satisfied to remain with a company which implements innovative strategies. Over time, the quality of employees will be higher than in a company which does not innovate.

(5) Fame, Mission for Society: Some people within management have the strong desire to be leaders within an industry. Some also have the strong belief that their company should contribute to society by supplying innovative services.

Reasons for Not Innovating

(1) Cost: Security innovations, which are generally perceived as being cheap to implement, are in fact quite costly (Kane, 1981). Huge amounts of money are required to attract innovative employees, as innovative employees must usually be won from their former place of employment. Investments for computers, such as information systems, are also quite costly. Silber (1983) suggests that there is considerable expense in designing new contracts, running a new secondary market, or installing requisite computer equipment. Hence, only a sustained increase in shadow prices over time will stimulate new product innovation.

(2) Time: Not only cost but also time spent generating an innovation must be considered. In order to generate innovations, financial institutions are forced to spend a considerable amount of time and to demand more of their human resources.

(3) Uncertainty: In generating security innovations, there is no guarantee of success. Nomura Research Institutes (1986) indicates that the Cash Management Account (CMA)

of Merrill Lynch and the financial service centres of Sears have succeeded in attracting new customers, but these have not contributed significantly to earnings, thus far. The reason is purely that demand has not yet matched the investment.

(4) Non-patentability: As mentioned previously, security innovations are not substantially patentable. Hence, they are easy to duplicate. Given the prohibitive costs and time spent on innovation, the safe course may be to follow the adaptive or quick reactive strategy.

(5) Temporary Market Share: Should the innovator manage to obtain a large market share, it would be quite difficult to keep this market share permanently. It would take little time for adapters (namely quick-reactors) to come out with imitations.

(6) No Experience-Curve: Considering the fact that security innovations are not material, but merely an idea or a concept, the experience-curve is not likely to have a significant effect on the security innovation. It is, however, possible that the experience-curve may prove important in designing computer systems to introduce and to trade the security innovations.

Summary and Conclusion of Reasons for Generating Innovations

Although many researchers give some guidance on why some innovate and why some do not, no empirical research is available to evaluate these claims, particularly with respect to security innovations. It is the intent of this thesis to provide some empirical research which will meet current needs and which will corroborate the above-mentioned reasons for and against generating security innovations.

3-3: How Innovators Generate Innovations

This sub-section will deal with how security innovators manage their organizational structures and environment so that these are conducive to fostering security innovations. There is virtually no empirical research which will help in constructing a framework for this research in the area of financial innovation literature. Hence, literature in the area of general innovation will be reviewed.

Prerequisites for Innovation

Daft and Becker (1978) indicate that the role of the environment of an organization or a firm is an important prerequisite for innovation. The environment promotes the incentive to innovate and enables innovative ideas to emerge. Based on their empirical study on innovativeness in high school districts, Daft and Becker claim that innovativeness has a positive correlation with: (1) the educational level of the community (external environment); (2) management's goals for educational quality (internal); (3) employee professionalism (resources); (4) employee travel; (5) the employee's spare time; (6) the administrative ratio; and (7) the availability of professional support staff.

Another important prerequisite for generating innovations is the organizational structure itself. Daft and Becker (1978) claim that slack resources and a large size are the most obvious characteristics which are necessary to increase the adoption of a favourable decision for innovation. (They define slack as the disparity between the resources available to the organization and the payments required to maintain it.)

The correlation between innovation and the size of the company is also of great concern to Crawford (1983). He argues that, historically, most innovations, especially product innovation, have been generated by individuals and small companies. Recently, however, innovations are gradually shifting to big corporations, since contemporary research requires a large assembly of costly equipment and teams of specialists representing various disciplines. His arguments lead to a conclusion that the entire field of R&D will be dominated by large firms in the future. Daft and Becker (1978) also suggest that the growth rate of an organization has a positive correlation with organizational innovativeness.

The influence of centralization and formalization on organizational innovation is also important. Zmud (1982) categorizes the innovation process into three phases: initiation, adoption, and implementation. He also categorizes the types of innovations into three types: technically compatible, technically incompatible, and administrative. Using this base, he suggests that centralization has a negative influence on the initiation and the implementation phases of the technically compatible innovation; formalization also has a negative influence on the initiation phase of the technically compatible innovation, and on the initiation phase of the technically incompatible innovation. However, on other phases of any type of innovation, both centralization and formalization have a positive influence.

The prerequisites for innovation mentioned above are neither sufficient nor a guarantee of success. The prerequisite for innovation and the actual generation of innovations are interrelated concepts and have a substantial overlap on each other.

Generation of Innovation/Innovation Strategy

The following examination deals with innovation strategy and is predominantly based upon Kamm's book, An Integrative Approach to Managing Innovation (1987), for two basic reasons. First, this book is very recent and refers to relevant recent literature. Second, the author puts forth suggestions on how organizations can innovate more selectively and wisely so that they can achieve their objectives.

Kamm argues that managerial attitudes play a significant role in fostering innovations. It is management which has to take the risk and to tolerate uncertainties and ambiguities. There must be a willingness to experiment, as this is the only way to ascertain that the product, service, or process will sell.

Based on these understandings, how can management execute the innovation process wisely? Kamm suggests that the innovation process be portrayed as circular, with double-headed arrows between its phases, to represent the idea that as new things evolve, they often stop and return to an earlier phase. These phases include formulating innovation strategies, generating and testing ideas, selling ideas in order to get resources, selecting innovations, implementing them, and relating the entire process to the organization's environment.

The idea generation phase can be assumed to be especially important for security innovations because security innovations are intangible; the resulting property is an idea rather than a tangible product or manufacturing process. Daft (1986) suggests that the existence of the idea generator, the creator, the inventor, who develops the idea and is devoted to it, is essential to this phase. Kamm suggests that certain climates are necessary for a high level of idea generation or discovery, but that they do not guarantee that a great number of ideas will be generated. These climates include supervisory

receptivity, management receptivity, funding difficulty, reward by practicality, early criticism, deadline pressure, teamwork, information access, and competition block.

Kamm (1987) and Crawford (1983) suggest the following sample sources of new ideas for innovations. The first, and most obvious, inside source is the set of existing services or products, or an existing process. Other sources are design, materials, by-products of existing product, rejected new products, rejected new service candidates, and consumer complaints. Sources of outside ideas include distributors, suppliers, and competitors, as well as technical studies, special market analyses, government reports, newspaper, magazine, and trade articles, and even customers. Although these outside sources are helpful, they sometimes have drawbacks, such as the resistance of in-house personnel to developing "foreign" inventions. Patents or technologies developed by other companies may be licenced; hence, in order to use these ideas as a new product, service, or process, they must be paid for. (This does not necessarily affect security innovations which may be difficult to patent.)

It is also important to obtain and to encourage innovative employees. Crawford argues that a flash of intuition may create a new idea to a very creative person, however, techniques for stimulating new products are also important to keep on generating innovations. This argument explains why such actions as "head-hunting" a space crew team or a Professor of Finance do not automatically guarantee the generation of security innovations.

When the development of ideas can continue only if more money, more personnel, and more facilities are allocated, the proposal phase of innovation is crucial. Kamm (1988) explores the question of whether or not any proposal should be highly formal. Some researchers claim that formality is necessary to prevent the innovation from being regarded as wasteful or uncertain. Others argue that formality distracts innovators from their primary task of creating new ideas and frustrates them; thus,

formality becomes time-consuming and harmful. However, there is no conclusive evidence either way. Through the selection phase, proposals to innovate are evaluated and are either accepted or rejected. Kamm also indicates how group dynamics can influence decision-making and concludes that, despite its drawbacks, group decision-making can be very effective, if used properly.

Innovations requiring capital investment are often long-term in nature, often fewer in number, and require larger funding than for operating expenditures. However, in the case of security innovations, relatively small budgets may be sufficient, in contrast to typical industrial or consumer products, as no complicated and elaborate production process is necessary to market a security innovation.

In the last stage of the innovation process, namely the implementing stage, management must ensure that an innovation is successfully promoted. Daft (1986) claims that the existence of a manager-champion, who acts as a sponsor to promote an idea within an organization, is crucial for smooth implementation. The manager-champion should have the prestige and authority to get a fair hearing and to allocate resources to the implementation of the innovation.

Summary of Generating Innovations

The generation of security innovations requires certain prerequisites, including climates suitable for innovation, resources, size, growth rate, and organizational structure. Also necessary is a knowledge of how security innovators manage their innovativeness. An investigation of the stages of the innovation process is necessary. These stages are: management attitude/strategy, climate/environment for innovation, idea generation, idea source, organization, personnel, budget, selection/proposal requirement, and implementation.

Considering the fact that security innovations are different from general product innovations in terms of patentability, copying, etc., there may exist a significant difference between the characteristics of the organizational structures and the environmental prerequisites for generating security innovations and non-financial product innovations. Hence, it is worthwhile to try to identify these significant differences, if any, as they apply to security innovators.

4. RESEARCH QUESTIONS

Having summarized relevant issues concerning innovations and security innovators, there are now four main areas to explore:

- (1) Is there a way to classify security innovations in a framework consistent with product innovation research? What is the consistency in the classification and categorization of security innovations across informed capital market participants?
 - (i) What do they consider as security innovations?
 - (ii) How do they classify security innovations on the "newness" dimension?
 - (iii) How do they characterize security innovations?
- (2) What are the reasons for generating security innovations by innovators?
 - (i) Who do informed market participants consider as innovators and non-innovators? How do they consider themselves on the "innovativeness" dimension?
 - (ii) Why do some aim to innovate and others do not?
- (3) Are there significant differences in the characteristics of the organizational structures and the environments for innovators and non-innovators? If so, what characteristics are most significantly different?
- (4) Is there a systematic relationship between a company's innovativeness and its size, capital, resources, locations, and organization structures?

5. RESEARCH METHODOLOGY

To answer the four previously-stated research questions, the methodology employed was an exploratory survey. Two hundred fifty-five investment houses from among four stock exchanges, namely Toronto, New York, London, and Tokyo, were selected as the test sample. Directories of members of the above four exchanges, The Financial Post 500, *Fortune* and *Euromoney* provided an exhaustive sampling frame.

As one of the objectives of this research is to measure the correlation between company size and innovativeness, a judgemental sampling method was employed to ensure that the test sample would cover the gamut from world-ranked major investment houses to small investment houses. The test sample, taken from directories of each exchange, included two components. The first was directed towards specific investment houses and leading companies, as found in various tables from the Financial Post 500, *Fortune*, and *Euromoney*. This portion of the test sample was biased towards "successful" companies, as measured by prestige, size, and profitability. The second portion of the test sample was a random selection from the remaining companies in the above mentioned directories. In total, 255 companies were selected as the test sample.

The survey instrument used in this research was a self-administered questionnaire. The design of this questionnaire used rating scales, attitude scales (especially Likert scales), and open-ended questions, as well as nominal demographic questions. Appendix B contains a description of the linkage between the research questions, the questionnaire, and the subsequent analysis methods.

A pre-test was conducted with executives from four investment houses on January 27 and February 1. The purpose of this pre-test was to identify problems, if any, in wording, questionnaire format, and other areas which impact on the validity of the findings from a study. The pre-test has contributed to improving and modifying the

questionnaire, which had been developed on the base of the general innovation literature made to fit research on investment houses. Appendix C contains the questionnaire used for this survey.

The operational procedures for gaining the cooperation of respondents were as follows. First, a letter from the School of Business was mailed out on February 21, 1989, to investment house corporate finance vice presidents requesting their cooperation and participation in the study (when the name of the vice president could not be ascertained, a letter was mailed out to the CEO). Then, the questionnaire was delivered to the respondents with the letter from the School of Business. During the first week of March, a telephone call from the researcher confirmed the participation and cooperation of the chosen firms. Finally, a thank you note was mailed out to the respondents in the second week of April.

6. RESEARCH RESULTS AND FINDINGS

6-1: Data Analysis

The analysis presented below provides empirical evidence to answer the research questions. Data was collected through a self-administered questionnaire completed by corporate finance vice-presidents or CEO's of investment houses. As the research design of this study is largely descriptive and qualitative, the methods employed in this study included a qualitative analysis, frequencies, means, t-test, and ANOVA with Tukey tests. Appendix B contains a description of the linkage between the research questions, the questionnaire, and the subsequent analysis methods.

The response rate statistics are as follows:

Table 1
Response Rate Statistics

	Toronto	New York	London	Tokyo	Total
Mailed out	67	94	53	41	255
Unable to contact	6	8	1	0	15
Did not respond	2	3	3	1	9
<hr/>					
Responses	8	18	3	14	43

$$\text{Response rate \%} = \frac{43 \times 100}{255-15} = 17.9\%$$

Considering the fact that these 43 respondents include some of the most active and enterprising people in the investment industry world-wide, this response rate is quite favourable. Note that possible limitations on this research, due to the small sample size, will be addressed at a later point.

6-2: Company Demography

In order to understand the overall make-up of the respondents and to understand the environments in which the sample companies operate, company demographic characteristics were examined first. The results presented in this section were gathered through Part D of the questionnaire. Areas of interest include: number of years in business (Table 2); number of full-time employees (Table 3); number of employees working overseas (Table 4); revenues in 1987 (Table 5); revenues in 1987 from overseas operations (Table 6); book value of the asset base in 1987 (Table 7); location of headquarters (Table 8); nature of the business (Table 9); and the average annual growth rate over the past five years (Table 10).

Table 2
Number of Years in Business

Year Business Started		# of Companies Cited
1)	1700 - 1899	5
2)	1900 - 1919	6
3)	1920 - 1929	5
4)	1930 - 1949	5
5)	1950 - 1959	5
6)	1960 - 1979	6
7)	1980 - 1989	7
8)	no answer	4
Total		43

Table 3
Number of Full-time Employees

# of Full-time Employees	# of Companies Cited
1) 10,001 and over	5
2) 5,001 - 10,000	8
3) 1,001 - 5,000	8
4) 501 - 1,000	3
5) 101 - 500	5
6) 1 - 100	9
7) no answer	5
<hr/>	
Total	43

Table 4
Number of Employees Overseas

# of Employees Overseas	# of Companies Cited
1) 1,001 and over	7
2) 301 - 1,000	3
3) 101 - 300	7
4) 1 - 100	5
5) 0	2
6) no answer	19
<hr/>	
Total	43

Table 5
Company's Revenue in 1987 (US\$)

Revenue in 1987	# of Companies Cited
1) 5,000,001 - 15,000,000	7
2) 1,000,001 - 5,000,000	8
3) 100,001 - 1,000,000	6
4) 10,001 - 100,000	4
5) 10,000 or less	6
6) no answer	12
<hr/>	
Total	43

Table 6

**Company's Revenue in 1987
from Overseas Operations (US\$)**

Overseas Revenue	# of Companies Cited
1) 1,000,001 - 5,000,000	2
2) 100,001 - 1,000,000	5
3) 10,001 - 100,000	6
4) 10,000 or less	6
5) no answer	24
<hr/>	
Total	43

Table 7

Book Value of the Asset Base in 1987 (US\$)

Book Value	# of Companies Cited
1) 5,000,001 - 1,000,000,000	7
2) 1,000,001 - 5,000,000	7
3) 100,001 - 1,000,000	9
4) 100,000 or less	9
5) no answer	11
<hr/>	
Total	43

Table 8

Location of Headquarters

Location	# of Companies Cited
New York	12
Tokyo	18
London	4
Toronto	4
Montreal	2
Other	2
No answer	1
<hr/>	
Total	43

Table 9

Nature of the Business (1 = very strong, 5 = very weak)

Company's Code Number	Underwriting	Wholesale Brokerage	Retail Brokerage	Corporate Finance	Risk Management	Others (including rank)	
1	1	1	1	1	2		
2	2	1	1	1	4		
5	1	1	1	1	1	asset management	1
7	2	2	2	2	3		
9	3	3	2	3	4		
10	3	2	1	3	3		
18	1	1	1	2	3		
19	1	1	1	1	2		
21	2	2	2	4	4		
22	1	1	1	1	3		
39	5	1	5	5	5		1
41	--	--	--	--	--		
42	--	1	1	1	4		
45	4	1	5	3	5	research	1
67	5	5	1	3	5		
70	4	2	3	3	2	money mgmt.	2
93	1	1	5	3	2		
100	1	1	1	1	2	money market	1
112	2	2	3	2	3		
119	--	--	--	--	--		
128	2	2	5	4	4	advisory services	1
133	3	2	--	2	--		
135	5	4	1	4	5		
138	3	4	2	3	2		
140	2	2	2	3	2		
147	3	1	5	3	4		
149	--	--	--	--	--		
151	1	3	2	1	1		
159	1	2	1	2	4	swap	1
176	2	3	1	2	1		
177	--	--	--	--	--		
190	4	4	3	5	5		
192	2	2	4	2	1		
224	5	5	3	2	2		
230	1	5	5	1	3		
400	1	2	1	5	3		
401	4	4	2	4	2		
402	3	3	1	3	2	investment trust sales	1
403	3	3	3	3	3		
404	1	1	1	1	1		
405	1	3	4	3	2		
406	2	2	--	1	2		

Number of companies cited

very strong	15	13	16	12	4
strong	9	12	7	8	14
neutral	7	7	5	12	8
weak	4	4	2	4	7
very weak	4	3	7	3	5
not applicable	4	4	6	4	5
total	43	43	43	43	43

Table 10
The Company's Average Annual Growth Rate
Over the Last 5 Years

Average Growth Rate		# of Companies Cited
1)	50% - 100%	4
2)	30% - 49%	8
3)	20% - 29%	8
4)	10% - 19%	5
5)	less than 10%	1
6)	no answer	17
Total		43

As can be seen, the responding companies are well distributed in terms of their size, book value, number of years in business, resources, and locations (Tables 2, 3, 5, 7, and 8, respectively). Table 4 and Table 6 also suggest that the sample runs the gamut of companies, from those which operate internationally to those which operate only domestically. Table 9 summarizes each respondent's business focus, that is, its strengths and weaknesses in terms of possible business pursuits. It is clear that the responding companies vary greatly in their business practices. Finally, Table 10 shows the average annual growth rate over the last 5 years. This generally high growth rate reflects the growth in the securities business in recent years; for example, the NYSE share volume increased at a yearly rate of 17.7%, compounded annually, between 1972 and 1987. (New York Stock Exchange, Inc., 1988.)

6-3: Security Innovations

This sub section will examine what the respondents considered security innovations to be, how they classified security innovations in terms of newness, and how they defined generically, what security innovations really were in terms of

quantifiable characteristics. The findings presented in this section were gathered through Part A-I of the questionnaire.

Table 11 (below) shows, in descending order, how respondents viewed the listed security innovations in terms of the given "newness" dimensions.

Table 11
Newness of Security Innovations (1 = very new; 5 = not new at all)

Security Innovations	Means	# of Valid Cases	Standard Deviation
1) Unbundled Stock Unit	1.667	33	1.080
2) heaven and hell bonds	2.233	30	1.305
3) Scores and Primes	2.333	24	1.435
4) floor-ceiling swaps	2.375	32	1.129
5) Commodity Linked Bonds	2.378	37	1.187
6) LYONs	2.435	23	1.343
7) interest rate swaps	2.548	42	1.383
8) currency swaps	2.634	41	1.428
9) adjustable rate preferred stock	2.727	33	1.206
10) money market preferred	2.750	32	1.191
11) stripped bonds	2.821	39	1.467
12) floating rate bonds	2.951	41	1.448
13) zero coupon bonds	3.070	43	1.595
14) exchangeable bonds	3.081	37	1.090
15) negotiable CDs	3.514	35	1.358

In the questionnaire, respondents were asked to indicate their views on the newness of each security at the time when it was first introduced. However, it seems that respondents may have been thinking of newness relative to the time period during which they completed the questionnaire. For example, respondents indicated Unbundled Stock Units (which are a very recent security) as being very new. Yet, they arrived at no consensus on zero coupon bonds, which were introduced at a much earlier date (although not shown here, 12 companies answered "very new" and 12 companies answered "not new at all". As a result, zero coupon bonds recorded the highest standard deviation). Thus, it can be assumed that there is no consensus on the newness of each security

innovation among respondents. This seems to corroborate Van Horne's (1985) suggestion that security innovations typically involve the modification of an existing idea, this idea being either product or a process.

Respondents were also asked to indicate the names of any other security innovations that they would like to add to the given list. Although 49 names were added, not all of them fit the definition of security innovations used in the study (see Appendix D). Despite the fact that the definition of security innovation for this research was clearly stated, lists of security innovations added by the respondents included not only products but also financial techniques, such as the combination of existing instruments, and hedging tools to meet client requirements. Furthermore, some of the names of security innovations were specific and specialized terms (i.e., ADAM, ZIPPER, ZEBRA, etc.). It is likely that this diversity is the main reason why literature in the area of financial innovations does not give a clear and concise definition of security innovations.

The questionnaire also dealt with the question of how informed market participants characterize security innovations in a framework consistent with product innovation research. The respondents were asked to indicate their degree of agreement or disagreement on each of the characteristics listed. Table 12 summarizes these findings.

Table 12
Characteristics of Security Innovations (1 = strongly agree; 5 = strongly disagree)

Characteristics of security innovations	Means	# of Valid Cases	Standard Deviation
1) advantage to be first to market	1.581	43	0.823
2) require a lot of time	1.884	43	1.005
3) require experience curve	1.953	43	0.950
4) easy to duplicate	2.233	43	1.020
5) market shares change quickly and unstable	2.442	43	0.908
6) intangible: idea rather than material	2.690	42	1.316
7) demand pulled rather than supply pushed	2.698	43	1.337
8) expensive	2.905	42	1.358
9) short life cycle	2.977	43	1.205
10) easy to market	3.791	43	0.914
11) occur more by accident than by plan	3.884	43	0.879
12) substantially patentable	3.953	43	1.253

Respondents strongly agreed that there was a significant advantage to being first to the market, that security innovations required a great deal of time, and that security innovations necessitated an experience curve. Respondents also agreed that security innovations were easy to duplicate and that market shares changed quickly and were thus unstable. Respondents seemed to disagree on the statements that security innovations were substantially patentable, that security innovations occurred more by accident than by plan, and that the innovations were easy to market.

There was no consensus among respondents on whether security innovations were or were not intangible, on whether security innovations were demand pulled or supply pushed, on whether or not security innovations were expensive, and on whether or not security innovations had a short life cycle.

To put these results into perspective, security innovations were related to a framework consistent with product innovation literature. The literature review (section 3) discussed some of the classification schemes for defining the categories of innovations. One of the frameworks suggested by Zaltman et al. (1973) was "programmed versus non-programmed" (depending on the degree of anticipation or how much scheduling the individual or organization has done in advance). Considering, from this research, that security innovations require a lot of time and are planned rather than occur by accident, it may be said that security innovations are "programmed". Nevertheless, considering that it is difficult to anticipate the kinds of new securities which will emerge next (Nomura Research Institute, 1986), it may be said that security innovations are "unprogrammed".

Another important framework to categorize innovation was suggested by Crawford (1983), the "demand pulled and supply pushed". However, no consensus on this categorization was reached from this current research work. Crawford (1983)

suggests that demand-pulled innovations owe their source to marketing and are generated by firms seeking products which help to meet the needs of their chosen or potential customer group. Contrarily, supply-pushed innovations owe their source to research and development and are generated by technical or scientific breakthrough. Considering, from this research, that the most important idea source for security innovation is corporate customers financial concern (see Table 23), that most investment houses are eager to generate security innovation (see Table 14), and that the most important reason to innovate is to protect and to expand the customer base, it may be concluded that security innovations are demand-pulled. Nevertheless, considering that one of the causes of security innovation suggested by literature is technology (Silber 1983, Van Horne 1985), some security innovation may be said to be supply-pushed.

Other means of classification suggested by Zaltman et al. (1973) and Crawford (1983) are: 1) instrumental versus ultimate (depending on whether the innovation is an end in itself or an instrument in achieving other ends); and 2) routine versus innovative (depending on the radicalness or novelty of the innovation). As the questionnaire revealed no concensus on what constitutes security innovations or on how to classify security innovations on the newness dimension, these two classification methods cannot be used to generalize or to classify security innovations.

6-4: Security Innovators

This sub-section will examine whom the respondents considered to be innovators and non-innovators, and how the respondents considered themselves. The findings presented here were gathered through Part A-II and Question #10 of the questionnaire.

Respondents were asked to evaluate leading companies in four stock markets: Toronto, London, New York, and Tokyo. Table 13 summarizes how the respondents

evaluated the innovativeness of each investment house in terms of security innovations. Note that, in Table 13, for U.S. companies, about 10% of the respondents answered "can't say". For British and Japanese companies, "can't say" responses accounted for about 50% of total responses. Furthermore, in the case of Canadian companies, more than 60% of respondents answered "can't say". It should also be noted that in the case of the U.S. companies, 6 companies out of 8 recorded a standard deviation less than 1.00, whereas 5 out of 6 Japanese companies, 5 out of 8 British companies, and 4 out of 10 Canadian companies recorded a standard deviation of less than 1.00. It follows that respondents are familiar with U.S. companies, but not with companies in other countries, especially Canadian companies.

Table 13
Leading Companies in Major Countries (1 = very innovative; 5 = not innovative at all)

Investment Houses	Means	# of Valid Cases	Standard Deviation
Canada			
1) Gordon Capital	2.438	16	1.459
2) Scotia McLeod	2.765	17	0.831
3) City Bank, Canada	2.933	15	1.100
4) RBC Dominion Securities	3.000	17	1.061
5) Wood Gundy	3.100	20	1.071
6) Burns Fry	3.125	16	1.147
7) T.D. Bank	3.235	17	1.300
8) Nesbitt Thomson Deacon	3.647	17	0.702
9) Levesque, Beaubien, Geoffrion	3.941	17	0.827
10) Richardson Greenshields	3.944	18	0.938
Great Britain			
1) S.G. Warburg & Co.	2.077	26	0.845
2) Morgan Grenfell Group	2.692	26	1.087
3) Kleinwort Benson Lonsdale	2.760	25	0.663
4) Schroders	2.840	25	1.106
5) Midland Montagu (Holdings)	3.042	24	0.999
6) N.M. Rothschild & Sons	3.080	25	0.997
7) Hambros	3.217	23	0.736
8) Hill Samuel Group	3.348	23	1.191

Table 13 (continued)**Leading Companies in Major Countries (1 = very innovative; 5 = not innovative at all)**

Investment Houses	Means	# of Valid Cases	Standard Deviation
U.S.A.			
1) Salomon Brothers	1.784	37	0.672
2) First Boston	1.838	37	0.800
3) Drexel Burnham Lambert	1.892	37	1.075
4) Morgan Stanley	1.919	37	0.924
5) Goldman Sachs	1.946	37	0.941
6) Merrill Lynch Capital Markets	2.083	36	0.906
7) Shearson Lehman Brothers	2.189	37	0.938
8) Kidder Peabody & Co.	3.250	36	1.052
Japan			
1) Nomura	1.500	24	0.590
2) Daiwa	2.333	24	0.868
3) Yamaichi	2.537	23	0.864
4) Nikko	2.870	23	0.757
5) New Japan	3.682	22	0.995
6) Kokusai	3.789	19	1.032

Table 13 also indicates that for U.S. companies, 7 out of 8 recorded a mean of less than 3.00, whereas 4 out of 6 Japanese, 4 out of 8 British, and 3 out of 10 Canadian companies recorded a mean of less than 3.00. These results indicate that in general respondents consider most U.S. companies to be significantly innovative. However, they do not consider investment houses in other countries to be innovative, Canadian companies in particular.

In the questionnaire, respondents were again requested to add the names of any other investment houses to the given list, if they felt a need. Eleven companies were suggested, including 5 companies in other countries (see Appendix E). It is interesting to note that when respondents were asked to add other names of popular security innovations, they added about 50 names of what they called security innovations (see Appendix D). Furthermore, for security innovators, 20 companies out of 32 recorded a standard deviation less than 1.00. For security innovations, there was no single security

innovation which recorded a standard deviation less than 1.00 (see Table 11). These findings indicate that respondents arrived more readily at a consensus on security innovators, and not on security innovations.

Next, the respondents were asked to consider their own companies on the innovativeness dimension. Table 14 summarizes their ratings as well as their attitude toward innovations, the number of innovations launched in the last three years, and performance.

Table 14

The Company's Self-Evaluated Innovativeness

Value Label	Frequency	Percent
Very innovative	11	25.6
Innovative	14	32.6
Neutral	5	11.6
Not innovative	5	11.6
Not innovative at all	6	14.0
Cannot say	2	4.7
<hr/>		
Total	43	100.00
Mean 2.54	Standard Deviation 1.40	

The Company's Attitude Towards Security Innovations

	Frequency	Percent
Definitely aiming to innovate	20	46.5
Somewhat aiming to innovate	13	30.2
Only in case of customer driven	6	14.0
Not aiming to innovate	4	9.3
<hr/>		
Total	43	100.00
Mean 1.93	Standard Deviation 1.14	

Table 14 (continued)
Number of Innovations Launched in the Last 3 Years

Value Label	Frequency	Percent
More than 10	5	11.6
5-10	8	18.6
2-5	15	34.9
1	4	9.3
None	11	25.6
<hr/>		
Total	43	100.00
Mean 3.19 Standard Deviation	1.33	

The Firm's Performance in Generating Innovations

Value Label	Frequency	Percent
Definitely satisfied	9	20.9
Satisfied	7	16.3
Neutral	12	27.9
Dissatisfied	11	25.6
Totally dissatisfied	4	9.3
<hr/>		
Total	43	100.00
Mean 2.86 Standard Deviation	1.28	

As can be seen, almost 60% of respondents consider themselves to be very innovative or innovative, whereas only 25% consider themselves to be not innovative. Furthermore, up to 80% of respondents answered that they were aiming to innovate. Respondents who indicated that they were not aiming to innovate accounted for only about 9% of the total respondents. It seems that, in general, respondents are highly interested in security innovations and are eager to innovate new securities. The reason why companies are eager to innovate will be examined in the next section.

When respondents were questioned on the degree of satisfaction with their performance in generating security innovations, their responses were very diversified. It

seems that generating security innovations is not so easy for investment houses. This corroborates another characteristic of security innovations found in the previous section, that security innovations require time and an experience curve.

Also of note is that the number of security innovations that respondents have launched in the last 3 years varies greatly from "none" to "more than 10". Some are launching innovations, and some are not launching any at all. The relationship between the respondents' innovativeness and the number of innovations launched will be examined later (see Table 16).

In the questionnaire, respondents were also asked to list the names of security innovations that they have actually launched in the last 3 years (see Appendix F). There is certainly no clear consensus on just who is the innovator of each security innovation. For example, Money Market Preferred Stock (MMP), which was first issued by Shearson Lehman Brothers for American Express in August 1984 (Jog and Deshpande 1987), was declared to have been innovated by three respondents in this survey. Furthermore, some names of security innovations are specific (rather than generic) terms given by the respondents, similar to a situation observed earlier (see Appendix D).

To further analyze sample companies, the relationship between their self-evaluated innovativeness and their attitude, the number of innovations launched in the last 3 years, and their innovativeness as evaluated by others, will be examined. Tables 15, 16, and 17 show the relationship between respondents' self-evaluated innovativeness and their attitude towards generating security innovations.

Table 15
Self-Evaluated Innovativeness and Attitude
 (# of companies cited)

self-evaluated innovativeness	aiming to innovate	not aiming to innovate
innovative	24	1
not-innovative	9	9

Table 16
**Self-Evaluated Innovativeness and the
 Number of Innovations Launched in the Last 3 Years**
 (# of companies cited)

self-evaluated innovativeness	# of innovations launched in the last 3 years				
	none	one	2-5	5-10	more than 10
Innovative	0	2	11	7	4
Not innovative	11	2	4	1	1

Table 17
**Self-Evaluated Innovativeness and
 Innovativeness Evaluated by Others**
 (# of companies cited)

self-evaluated innovativeness	innovative* evaluated by others	not-innovative** evaluated by others
innovative	7	2***
not-innovative	0	3

* a mean of less than 3

** a mean of more than 3

*** mean 3.125, standard deviation 1.147; mean 3.250, standard deviation 1.052

Almost all the respondents who evaluated themselves as being innovative were aiming to innovate. Those respondents who evaluated themselves as being not-innovative were equally divided between those aiming to innovate and those not aiming to innovate. Literature in the area of product innovation points out three types of innovation strategy: pioneering, adaptive, and imitative. All are profitable if employed at the right time (Crawford 1983). Clearly, for security innovations, investment houses in the study sample prefer the pioneering strategy.

Table 16 summarizes the relationship between the company's self-evaluated innovativeness and the number of innovations they have launched in the last three years. Not surprisingly, respondents who declare themselves innovative tend to have launched more innovations than those who regard themselves as non-innovative. Table 17 summarizes the relationship between self-evaluated innovativeness and innovativeness as evaluated by others. The sample includes 12 investment houses listed in Table 13; hence, it can easily be observed whether or not their self-evaluation (Table 14) is consistent with the results of the evaluation by others (Table 13). As is obvious, a strong positive relationship exists between self-evaluation and evaluation by others (10 out of 12 companies).

As a rule, there seems to be consistency among the respondents' self evaluation, the actual number of innovations that they have launched in the last three years, and the evaluation by others. In other words, companies which claim to be innovative are, in general, those which are aiming to innovate, those which are actually innovating new securities, and those, for the most part, which are considered innovative by other companies.

6-5: The Purpose of Investment Houses Generating Security Innovations

This sub-section will examine why some investment houses aim to innovate and others do not. The literature reviewed in this thesis outlines the various reasons for both innovating and not innovating security innovations. In the questionnaire, respondents were asked whether or not they were aiming to innovate, and were also asked for their degree of agreement with each of the reasons covered in the literature review. The results presented here were gathered from part B of the questionnaire. The 43-company sample was split into two subsamples: 33 companies which were aiming to innovate, and 10 companies which were not aiming to innovate. A t-test was conducted. The level of significance at which a difference is accepted, in this research, is 2-tail probability ≤ 0.05 . Also, comments are made when the 2-tail probability ≤ 0.10 . Table 18 summarizes these findings.

Table 18
Purpose of Generating Security Innovations (2 subsamples)

Reasons to Innovate	33 companies		10 companies		2-tail prob.
	mean	S.D.	mean	S.D.	
1) to protect and expand customer base	1.52	.57	1.50	.97	.951
2) high margin/profitable	1.61	.70	1.70	1.06	.745
3) fame, corporate image	2.33	1.14	2.40	1.17	.873
4) customer-driven relationship	2.36	1.17	2.10	1.20	.537
5) to enhance human growth and employee potential within the company	2.79	1.24	4.20	.92	.002
6) cost reduction	2.91	1.25	2.80	1.40	.821
7) others					
- purchaser driven					

Table 18 (continued)
Purpose of Generating Security Innovations (2 subsamples)

Reasons Not to Innovate	33 companies		10 companies		2-tail prob.
	mean	S.D.	mean	S.D.	
1) time consuming	2.19	1.06	1.90	1.10	.463
2) uncertain/risky	1.91	.88	2.00	0.94	.779
3) no experience	2.27	1.15	2.00	1.33	.531
4) cost too much	2.63	1.26	2.10	1.20	.253
5) not profitable	3.58	.94	2.90	1.20	.068
6) temporary market share	2.69	1.06	3.00	1.23	.455
7) non-patentability	2.88	1.29	4.30	.68	.002
8) others					
- unawareness of need					
- lack of staff					
- do not have the right culture					
- bad for team spirit					
- lack of creative time					

Overall, respondents seem to agree on the reasons to innovate (whether they are aiming to innovate or not). These reasons are that security innovation is to protect and to expand the customer base, and that security innovation is a profitable and high margin business. Other reasons supported by respondents are that security innovation is a means to gain renown and towards improving the corporate image, and that security innovation is generated by the customer-driven relationship.

The reasons for innovating on which respondents do not agree are that security innovation is for cost reduction, and that security innovation enhances human growth and employee potential within the company.

The group of companies aiming to innovate display no consensus on whether or not security innovation enhances human growth and employee potential. Companies not aiming to innovate arrive at the significant consensus that security innovation does not enhance human growth and employee potential.

The reasons not to innovate supported by respondents are that: 1) security innovation is time consuming; 2) security innovation is risky/uncertain; 3) some investment houses have no experience; and 4) security innovation costs too much.

The reasons not to innovate on which respondents do not agree are that: 1) security innovation is not profitable; 2) the market share of security innovation is temporary; and 3) security innovation is not patentable.

Companies which are aiming to innovate agree that "not profitable" is not a reason for not innovating. Companies not aiming to innovate arrive at no consensus on this point.

Companies planning to innovate reach no consensus on whether or not "not patentable" is a reason not to innovate. Those companies not aiming to innovate strongly agree that "not patentable" is no reason for non-innovation.

The fact that respondents agreed that innovation is "time consuming" corroborates the finding that security innovation requires a considerable amount of time (see Table 12). Also, this finding conforms with literature in the area of financial innovation (i.e., Kane 1981, Silber 1983).

That respondents supported the view that "some investment houses do not innovate because they have no experience" corroborates the finding that security innovations require an experience curve. (See Table 12)

Note also that in Table 12 respondents agreed that the market share of security innovations changes quickly, and that security innovations are not substantially patentable. However, these two facts are not supported as reasons not to innovate.

As seen in Table 15, the questionnaire respondents can be categorized in two ways, with each category having two sub-categories. The first category, that of innovation intentions, was sub-categorized into those companies intending to innovate

and those not intending to innovate. The second category, that of self-evaluation of innovativeness, was sub-categorized into those companies perceiving themselves as innovative and those perceiving themselves as non-innovative. This categorization results in four group-types of companies:

1. Companies aiming to innovate and considering themselves to be innovative, referred to as "AI" (24 companies).
2. Companies aiming to innovate but not considering themselves to be innovative, referred to as "ANI" (9 companies).
3. Companies neither aiming to innovate nor considering themselves to be innovative, referred to as "NANI" (9 companies).
4. Companies not aiming to innovate but considering themselves to be innovative, referred to as "NAI" (1 company).

For comparison purposes the NAI group is excluded, as it consists of only one company. In order to examine any differences among the three remaining groups (AI, ANI, and NANI), with respect to reasons for innovating or not innovating, an Analysis of Variance with Tukey Tests for pairwise differences was conducted. The data for an analysis of variance must meet two conditions: 1) each group must be a random sample from a normal population; and 2) in the population, the variances in all groups must be equal (Norusis 1986). Because the number of companies in each of the three groups is different, the equal variance assumption is especially important. To check whether or not the groups have almost the same variance in population, their histograms were examined and the variance for each group was computed, then these were compared. The level of significance accepted in this analysis is $\alpha \leq .05/67 \text{ variable} = .00075$. Comments are indicated when $\alpha \leq .05$. Table 19 summarizes the findings of this analysis.

Table 19
Purpose of Generating Security Innovations (3 groups)

	AI (24) mean	ANI (9) mean	NANI (9) mean	level of signifi- cance	Pairs of groups signifi- cantly different
Reason to Innovate					
to enhance human growth and employee potential within the company	2.71	3.13	4.25	.0125	AI-NANI
fame, corporate image	2.04	3.25	2.13	.0255	AI-ANI
Reason Not to Innovate					
not patentable	2.88	2.91	4.25	.0310	AI-NANI

For the first reason to innovate, to enhance human growth and employee potential within the company, the AI group is different from the NANI group, and the level of significance is .0125. However, the ANI group does not show a significant difference from the AI and the NANI groups.

AI companies appear to be unsure as to whether or not security innovations enhance human growth and employee potential within the company, and whether or not "not patentable" is a good reason to not innovate. NANI companies disagree with both of the above-mentioned variables. This is not surprising. This undoubtedly explains why AI companies are aiming to innovate and NANI companies are not.

It is interesting to note that AI companies agree that one of the reasons to innovate is for "fame, corporate image". ANI companies neither agree nor disagree on this variable. There is nothing to indicate whether a company's innovativeness derives from a desire for fame or corporate image, or whether the desire for fame or corporate image is derived from company's innovativeness.

To put these findings into perspective, a comparison is made of the differences between security innovations and general product innovations. For security innovations, "cost reduction" is not an important issue. However, it is indeed a principal issue for general product innovations (Kamm 1987, Crawford 1983). This difference

between security innovations and product innovations can be attributed to the fact that security innovations are ideas, and therefore do not require a manufacturing process. Curiously, though, there seems to be no difference in terms of the purpose of generating innovations. In other words, whether the nature of the product is an idea or a material, the reasons for innovation remain essentially the same.

In summary, the reasons to innovate supported by respondents are that:

- 1) security innovation is a means to protect and to expand the customer base;
- 2) security innovation is a profitable/high margin business;
- 3) security innovation is for fame/corporate image;

(Note that AI companies agree that one of the reasons to innovate is "fame/corporate image". Whereas ANI companies neither agree nor disagree on this point.)

- 4) security innovation is customer driven.

The reasons to not innovate supported by respondents are that:

- 1) security innovation is time-consuming;
- 2) security innovation is risky or uncertain;
- 3) some investment houses do not have experience;
- 4) security innovation cost too much.

6-6: Organizational Characteristics and Environments for Fostering Innovations: Separating Innovators from Non-Innovators

This sub-section will deal with identifying the significant differences in the characteristics of organizational structures and the environments for fostering security innovations which separate innovators from others. There is virtually no empirical research available which reports on how security innovators generate security innovations. Hence, the literature available for review outlined the general product innovation process based on the work of Kamm (1987). Phases of the innovation process described in the available material include management attitude and strategy, the climate or internal environment, idea generation, idea source, organization, personnel, budget, and selection and implementation. In Part C of the questionnaire, respondents were asked for their degree of agreement with statements intended to describe how their companies deal with the above-mentioned phases of security innovations. Based on their self-evaluated innovativeness in Table 15, the 43-company sample was split into two subsamples: 25 companies evaluating themselves as innovative and 18 companies declaring themselves to be not innovative. The differences between these two groups were examined using a t-test. The level of significance at which a difference was accepted was 2-tail probability ≤ 0.05 . Comments are also made when the 2-tail probability ≤ 0.10 . Table 20 considers "management attitude and strategy" towards security innovations.

Table 20
Management Attitude and Strategy (1 = strongly agree; 5 = strongly disagree)

	Innovators		Non-innovators		2-tail Prob.
	Mean	S.D.	Means	S.D.	
1) Management defines market segment that new securities should attract	2.56	0.96	3.35	1.37	.033
2) Management defines the roles that security innovations should play in the market	2.76	1.33	3.29	1.45	.225
3) Management is tolerant of risk and uncertainty	2.80	1.23	3.00	1.23	.606
4) Management has no innovation strategy	3.68	1.03	2.71	1.45	.015

As can be seen, there was no strong agreement or disagreement in this phase within each of the two groups, as the standard deviations are between 0.96 and 1.45 for the four questions. However, 2 out of 4 variables recorded significant differences between the two groups at the .05 level. In the case of the innovators' subgroup, respondents indicated that their management had an innovation strategy and that it defined the strategic roles that a new security should play in the market. In the non-innovator subgroup, the management did not seem to have an innovation strategy. This corroborates Kamm's (1987) conclusion that managerial attitudes play a significant role in fostering innovations.

Table 21 graphically indicates the companies' internal environment or climate.

Table 21
The Company's Internal Environment or Climate
 (1 = strongly agree; 5 = strongly disagree)

	Innovators		Non-innovators		2-tail
	Mean	S.D.	Mean	S.D.	Prob.
1) employees feel confident that their ideas are valued	1.79	0.66	2.12	1.11	.246
2) employees who author new ideas are rewarded non-monetarily	2.38	0.77	2.94	0.97	.043
3) employees who author new ideas are rewarded with a bonus	2.46	1.14	2.53	1.33	.855
4) to get information for ideas from others in the company is easy	2.64	0.95	3.18	1.07	.105
5) innovations are discussed with colleagues both outside and inside of the company	2.92	1.32	2.53	1.07	.323
6) new ideas are criticized before developed	3.21	1.14	3.24	1.48	.948
7) the company has few team-player employees	3.63	1.17	3.71	1.26	.814
8) employees fear job damage if ideas fail or are rejected	3.75	0.90	4.18	1.19	.197
9) the company has strict deadlines for innovations	4.13	0.80	4.47	0.62	.144

Here, within the two groups, agreement on certain variables is quite strong: the standard deviation for variables scores are below 1.00 for many questions.

Innovative companies agree that employees feel confident that their new ideas are valued, that employees who author new ideas are rewarded both monetarily and non-

monetarily, and that it is easy to get information for ideas from others in the company. They also indicate that the company does not have a strict deadline for innovations, that employees do not fear job damage or threat if their ideas fail or are rejected, and that the company has team-players as employees. There is no consensus on whether or not innovations are discussed with colleagues within and outside of the company, or on new ideas being criticized before they are really developed.

Non-innovative companies also agreed that employees feel confident that their new ideas are valued, and that employees who author new ideas are rewarded monetarily. However, they are not as strong in their agreement as innovative companies. Non-innovative companies also agreed that innovations are discussed with colleagues both outside of and within the company. Innovative companies are equanimous on this point. Non-innovative companies do not agree on other variables.

The most significant difference between innovative companies and non-innovative companies was found in terms of the reward system. The more innovative companies have a reward system in the form of non-monetary recognition. This implies that innovation is not simply for money.

Table 21 also displays that for innovative companies it is easy to get information for ideas from others in the company; this is not the case for non-innovative companies.

Overall, the responses from innovative companies more often satisfy Kamm's (1987) suggestions for maintaining organization innovativeness.

Table 22 looks at the idea generation phase.

Table 22
Idea Generation Phase (1 = strongly agree; 5 = strongly disagree)

	Innovators		Non-innovators		2-tail
	Mean	S.D.	Mean	S.D.	Prob.
1) the company encourages personnel at all levels	2.00	0.87	2.82	1.47	.028
2) one person is in charge of the idea generation phase	2.60	1.16	3.82	1.13	.002
3) the company's internal newspaper has information on innovations	2.92	1.30	2.53	1.28	.323
4) centralization	3.20	1.00	3.88	1.36	.068
5) the company sponsors workshops to hear outsiders	3.36	1.29	4.00	1.30	.146
6) formalization	3.42	0.93	4.06	1.25	.066

Innovative companies agree that the company should encourage personnel at all levels and that one person or group is in charge of the idea generation phase. They disagree on the statements that the idea generation phase is managed in a formal manner, and that the company should sponsor workshops to hear outsiders' opinions. They neither agree nor disagree on the other two variables.

Non-innovative companies conclude that the company's internal newspaper has information on innovations. There was no consensus on any of the other variables.

For innovative companies, two variables recorded significant differences at the .05 level: that all personnel are encouraged to generate ideas, and that a specific person or group is in charge of and continually taps external and internal information sources for new ideas. For the non-innovative group, there was no significant agreement on these variables. This finding corroborates Daft's (1986) suggestion that the existence of the

idea generator, who develops the idea and is devoted to it, is essential for the idea generation phase.

It is also worth noting that two variables recorded significant differences at the .10 level. It is surprising that centralization and formalization in the idea generation phase are more significantly rejected by the non-innovators' subgroup than by the innovators' subgroup. This contradicts the findings of authors cited earlier. For example, Zmud (1982) and Daft (1983) suggest that centralization has a negative influence on the initiation phase of the innovation.

Finally, it is notable that "company's internal newspaper" and "workshops to hear outsiders" do not seem to be discriminant variables among innovative companies.

Table 23 deals with the idea source phase.

Table 23
The Idea Source Phase

	Innovators		Non-innovators		2-tail
	Mean	S.D.	Mean	S.D.	Prob.
1) corporate customer's financial concerns	1.64	0.64	2.24	1.03	.026
2) corporate customers satisfaction with existing services	1.96	0.61	2.24	0.90	.245
3) brainstorming sessions	2.00	0.66	3.47	1.01	.000
4) monitor industry movements	2.13	0.95	3.18	1.19	.003
5) regular contact with customers	2.44	1.33	3.18	1.02	.060
6) innovation group meets regularly	2.52	1.16	3.65	1.17	.004
7) academic journals	2.83	1.27	3.47	1.28	.123
8) participate in "peer institution" exchange groups	3.38	0.97	3.47	1.13	.773

As can be seen, innovative companies agree on 6 out of 8 variables. There was no consensus on the use of academic journals as an idea source or on participation in "peer institution" exchange groups. Non-innovative companies agree on only 2 out of 8 variables. With the exception of these two variables, they record means of more than 3.00 on every variable.

This seems to be the most differentiating phase. As can be seen, 4 variables out of 8 recorded significant differences between the 2 subsamples at the .05 level. From these findings, the idea source phase of innovative companies can be described as follows: Innovative companies discuss with corporate customers their financial concerns and satisfaction with existing services; they systematically monitor financial innovations within various sectors of the financial service industry and conduct regular brainstorming sessions on possible new innovations; their innovation groups hold regular meetings with customer relationship managers, and the companies have a systematic procedure for regularly contacting customers as well as conducting interviews about their needs.

In the case of non-innovative companies, they also discuss with corporate customers their financial concerns and satisfaction with existing services. However, their degree of agreement is significantly lower than that for innovative companies. With the exception of this variable, the previously-detailed idea source description is not applicable to non-innovative companies. This finding of constant activity is in concordance with Crawford's (1983) argument that, even though a flash of intuition may create a new idea in a very creative person, techniques for stimulating new ideas must be created and maintained on an ongoing basis to keep generating innovations.

As with innovative companies, non-innovative companies reached no consensus on the use of academic journals as a source for new ideas. Also note that neither innovative companies nor non-innovative companies participate in "peer institution" exchange groups or other similar endeavours for getting new ideas.

Table 24 presents the organization structure of the respondents.

Table 24
Organization (1 = strongly agree; 5 = strongly disagree)

	Innovators		Non-innovators		2-tail
	Mean	S.D.	Mean	S.D.	Prob.
1) Sufficient communication between customer relationship managers and product line departments	2.40	1.12	3.00	1.17	.102
2) Authority for innovations is decentralized	2.76	0.97	2.82	1.19	.850
3) Company uses temporary project team for innovation	3.04	0.98	3.47	1.28	.224

Innovative companies agree that they have sufficient communication between customer relationship managers and product line departments; they neither agree nor disagree on the other two variables. Non-innovative companies record no significant agreement or disagreement on any of the variables.

The only difference (at the .102 level) observed between innovators and non-innovators is that innovative companies have sufficient communication between customer relationship managers and product line departments in the form of reports or meetings.

Table 25 looks at the budget phase.

Table 25
Budget Phase (1 = strongly agree; 5 = strongly disagree)

	Innovators		Non-innovators		2-tail
	Mean	S.D.	Mean	S.D.	Prob.
1) budget for innovation is decided case by case	2.33	1.09	2.47	1.36	.737
2) few levels of approval are required to access innovation budget	2.54	1.02	3.07	1.39	.182
3) management demonstrates tangible support for innovation	2.75	1.13	3.75	1.29	.013
4) budget for innovation is not important, too small	3.08	1.50	2.47	1.41	.209

Innovators seem to agree that the budget for security innovations is decided case by case, and that few levels of approval are required to access such a budget. They neither agree nor disagree on the statement that management demonstrates tangible support for innovation, neither do they reach an agreement on whether budgeting for innovation is important or not.

Non-innovative companies disagree, but not very significantly (standard deviation 1.29), with the statement that management demonstrates tangible support for innovation. They seem to have no consensus on the other variables.

The only difference found between the two subsamples is that, for innovative companies, management demonstrates tangible support for innovation through a specific budget allocation, whereas this is not the case for non-innovative companies.

Kamm (1987) claims that innovations requiring capital investment are often long-term in nature and the actual amount of funding is greater for capital investment than for operating expenditures. However, in the case of security innovations, the budget for

innovating is decided case by case, hence, there is no consensus among respondents on whether the budget for security innovation is small or large.

Table 26 deals with the selection/implementation phase of the innovation process.

Table 26
Selection/Implementation Phase

	Innovators		Non-innovators		2-tail
	Mean	S.D.	Mean	S.D.	Prob.
1) Group decision-making	1.83	0.72	2.47	1.23	.044
2) Someone with prestige and authority acts as a sponsor to promote innovations	2.74	1.05	2.59	1.37	.696
3) Centralization	2.83	1.34	3.47	1.51	.161
4) Implementation of innovation is inexpensive	3.22	0.85	3.00	0.71	.397
5) Formalization	3.26	1.05	3.65	1.22	.291

Innovative companies agree that they employ group decision-making for selecting and implementing security innovations. They neither agree nor disagree on the remaining variables.

Non-innovative companies neither agree nor disagree on whether the implementation of security innovations is expensive or not. They agree, but not significantly (standard deviation 1.23), that they employ group decision-making for innovations. They disagree, but not significantly (standard deviation 1.22), on the statement that their selection phase of innovation is managed in a formal manner.

The only significant difference observed is that innovators have a higher degree of group decision-making for launching security innovations than the non-innovators subgroup. It follows that group decision-making is effective and that it must be used properly in the case of security innovations. This corroborates research cited earlier. For example, Kamm (1987) indicates that group dynamics can influence decision-making and

concludes that, despite its drawbacks, group decision-making is very effective if used properly.

Table 27 summarizes the variables which exhibited significant differences between innovative companies and non-innovative companies in each of the six phases of the security innovation process.

Table 27
Differences Between Innovators and Non-Innovators
(1 = strongly agree; 5 = strongly disagree)

	Innovators Mean	Non-Innovators Mean	2-tail Prob.
management attitude/strategy			
management defines market segment that new security should attract	2.56	3.35	.033
management has no strategy	3.68	2.70	.015
internal environment/climate			
reward is non-monetary	2.38	2.94	.043
idea generation			
encourage lower level personnel	2.00	2.82	.028
product champion	2.60	3.82	.002
centralization	3.20	3.88	.068
formalization	3.42	4.06	.066
idea source			
corporate customer concerns	1.64	2.24	.002
brainstorming sessions	2.00	3.47	.000
monitor movement in financial industry	2.13	3.18	.003
regular contact with customers	2.44	3.18	.060
frequent contact with customer relationship managers	2.52	3.65	.004

Table 27 (continued)
Differences Between Innovators and Non-Innovators
 (1 = strongly agree; 5 = strongly disagree)

	Innovators Mean	Non-Innovators Mean	2-tail Prob.
organization			
sufficient communication between customer relationship managers and product line departments	2.40	3.00	.102
budget			
tangible support for innovation	2.75	3.75	.013
selection/implementing			
group decision	1.83	2.47	.044

The most significant differences between innovative companies and non-innovative companies are found in three variables: the idea source; idea generation; management attitude/strategy phases. In innovative companies, there exists a specific person or group who is in charge of developing new ideas. They also encourage all their employees, regardless of level, to generate ideas, and they regularly absorb new ideas from a variety of internal and external sources. Such is not the case for non-innovative companies. This difference seems to be the main point separating innovative companies from non-innovative ones.

As mentioned earlier, the 43 respondents were classed into two categories, which resulted in four basic groups of respondents: AI, ANI, NANI, and NAI. The NAI group was excluded from further study as it consisted of only one company. In order to examine any significant differences in organizational characteristics for fostering innovations among the three groups, that is AI, ANI and NANI, an ANOVA with Tukey Tests for pairwise differences was conducted (following from Table 19). The level of significance accepted in this analysis was $\alpha \leq .05/67 \text{ variables} = .00075$. Table 28 shows the findings of the tests.

Table 28
Differences Among the Three Groups

	AI (24) mean	ANI (9) mean	NANI (9) mean	level of signifi- cance	Pairs of groups signifi- cantly different
management					
management is tolerant of risk and uncertainty	2.75	2.00	4.00	.0040	AI-NANI ANI-NANI
management defines market segment that new securities should attract	2.58	3.13	3.86	.0414	AI-NANI
management has no innovation strategy	3.75	3.25	1.71	.0004	ANI-NANI AI-NANI
internal environment/ climate					
employees feel confident that their ideas are valued	1.79	1.63	2.71	.0218	ANI-NANI AI-NANI
employees who author new ideas are rewarded	2.46	1.50	3.43	.0056	ANI-NANI
company has few team-player employees	3.6 ²	4.63	2.57	.0029	ANI-NANI
idea generation					
company encourages all levels of personnel	2.00	2.38	3.57	.0081	AI-NANI
one person is in charge of idea generation phase	2.54	4.13	3.71	.0029	AI-ANI
idea source					
corporate customer's financial concerns	1.63	2.00	2.57	.0300	AI-NANI
monitor industry movements	2.13	3.38	3.29	.0054	AI-NANI AI-ANI
brainstorming sessions	1.96	3.38	3.86	.0000	AI-ANI AI-NANI
innovation group meets regularly	2.46	3.38	4.14	.0035	AI-NANI

Table 28 (continued)
Differences Among the Three Groups

	AI (24) mean	ANI (9) mean	NANI (9) mean	level of signifi- cance	Pairs of groups signifi- cantly different
budget					
management demonstrates tangible support for innovation	2.75	4.13	3.67	.0115	AI-ANI
implementing/selecting					
group decision-making	1.83	2.25	3.00	.0217	AI NANI

In the management attitude phase, there were three differences between AI companies and NANI companies. In NANI companies, the management had no innovation strategy, did not define the market segment that new securities should attract, and was not tolerant of risk and uncertainty. This may simply be because these companies are not aiming to innovate. These characteristics did not apply to AI companies. It is interesting to note that ANI companies have a higher tendency to be tolerant of risk and uncertainty than AI companies.

In the internal environment/climate phase, employees of NANI companies were not confident that their ideas were valued and employees who came up with new ideas were not monetarily rewarded. It is interesting that ANI companies have a higher tendency to reward monetarily than do AI companies. It would appear that innovation is not being conducted purely for monetary reasons. Non-monetary reasons, nevertheless, are equally important. It should also be noted that ANI companies have a higher tendency to have team players than do AI companies.

In the idea generation phase, AI companies encourage all personnel, and one person is in charge of idea generation. This is not the case for the other companies. This finding corroborates the findings presented in Table 27.

In the idea source phase, AI companies use a variety of idea sources both internally and externally. This is not the case for the other two groups.

In the budget phase, AI companies do not arrive at a clear consensus on whether or not management demonstrates tangible support for innovations. In ANI companies, management does not tangibly support innovation. This further corroborates the findings presented in Table 27.

In the selection/implementing phase, it is clear that AI companies have a higher tendency to adopt group decision-making than the other two subsamples. This result also supports the findings in Table 27.

The remaining phase of innovation to be examined is that of personnel in terms of both educational background and age category. Note that in the questionnaire, respondents were asked to indicate the educational background and age category of employees who contributed in terms of security innovations and rank them in order. Table 29 graphically presents this information.

Table 29

Personnel — Educational Background (number of times cited)

Educational Background	No. 1	No. 2	No. 3
Ph.D. in Business	2	1	1
MBA	8	8	3
B.Comm. or B.A.	3	5	5
Ph.D. in non-business field	1	3	2
M.Sc.	3	4	1
B.Sc.	3	2	1
Can't say	19	18	25
Other			
- CA	2	0	0
- Masters Tax Law	1	1	0
- JD	1	0	0
- experienced trader with high school education	0	1	3
Total	42	43	43

Table 29 (continued)

Educational Background	(number of times cited)											
	AI (24)			ANI (9)			NANI (9)			NAI (1)		
	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3
Ph.D. in Business	2	1	1	0	0	0	0	0	0	0	0	0
MBA or MMS	5	6	2	2	1	1	1	1	0	0	0	0
B.Comm. or B.A.	1	2	5	1	2	0	1	1	0	0	0	0
Ph.D. (non-business)	1	2	1	0	1	1	0	0	0	0	0	0
M.Sc.	1	4	1	2	0	0	0	0	0	0	0	0
B.Sc.	2	0	0	1	2	0	0	0	1	0	0	0
Other	3	1	1	0	1	4	0	0	0	0	0	0
Can't say	8	8	13	3	2	3	7	7	8	1	1	1

According to Table 29, almost half of the respondents answered "can't say" as to which educational backgrounds contributed to innovations. Overall, MBA's, B.Comm.'s, and B.A.'s were most frequently cited, followed by M.Sc.'s, B.Sc.'s, and Ph.D.'s. AI companies cited Ph.D.'s in business, Ph.D.'s in non-business fields, M.Sc.'s, as well as MBA's or B.Comm.'s. Other subsamples, especially those which are not aiming to innovate, did not cite any of these educational categories. This result is in accord with recent reports in the financial press about some investment houses "head hunting" for so-called rocket scientists and finance professors.

Table 30 looks at the age of employees who have contributed to generating security innovations.

Table 30
Personnel — Age

Age Category	(number of times cited)		
	No. 1	No. 2	No. 3
25 or younger	0	4	1
26 - 30	13	6	4
31 - 35	9	11	6
36 - 40	5	8	11
41 or older	6	3	6
can't say	10	11	15
Total	43	43	43

Table 30 (continued)

Age Category	AI (24)			(number of times cited)									NAI (1)		
	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3
25 or younger	0	2	1	0	1	0	0	1	0	0	0	0	0	0	0
26-30	11	2	2	1	2	0	1	2	1	0	0	1	0	0	1
31-35	5	8	4	2	2	2	1	1	0	1	0	0	1	0	0
36-40	2	5	6	2	1	3	1	1	2	0	1	0	0	1	0
41 or older	2	2	3	2	1	2	2	0	1	0	0	0	0	0	0
can't say	4	5	8	2	2	2	4	4	5	0	0	0	0	0	0

Here, again, there were a large portion of "can't say" answers. It seems that relatively younger personnel have contributed more than older personnel. Note that AI companies have a tendency to cite a larger percentage of younger personnel contributing to innovation than other subsamples. Assuming that younger personnel are generally at a lower level, this corroborates the finding that innovative companies encourage lower level employees as well as higher level ones (see Tables 27 and 28).

In summary, the factor which distinguishes innovative companies from non-innovative ones is the idea generation process. The factors which characterize innovative companies are that:

- 1) a variety of idea sources both internal and external are used for idea generation
- 2) there exists a specific person or group in charge of developing new ideas
- 3) all employees are encouraged to generate ideas
- 4) techniques to stimulate new ideas are used in the group which is responsible for innovation
- 5) employees tend to be rewarded non-monetarily
- 6) the decision to implement and select innovations is made in a group

- 7) management has an innovation strategy and defines the market segment that a new security should attract.

As well, ANI companies have a higher tendency to be tolerant of risk and uncertainty than do AI companies, and ANI companies also have a higher tendency to reward monetarily. AI companies have a higher tendency to reward non-monetarily. In addition, ANI companies have a higher tendency to have team players than AI companies.

Finally, it should be noted that AI companies involve personnel with Ph.D.'s, M.Sc.'s, MBA's, or B.Comm.'s in the innovation process. This is not the case for other companies. Also note that AI companies have a tendency to allow a larger percentage of younger personnel to contribute to innovation than other subsamples.

6-7: The Relationship Between Innovativeness and the Demographics/ Nature of the Business

This sub-section examines what systematic relationships can be observed between company innovativeness and size, capital, resources, locations, and organizational structures. For this purpose, a "T" test was conducted. The level of significance at which a difference is accepted in this research is 2-tail probability $\leq .05$. Comments were made when 2-tail prob. $\leq .10$. The data for this section were gathered from Part D of the questionnaire. Table 31 summarizes the data.

Table 31
Company's Innovativeness and Demographics

	Innovators Mean	Non-innovators Mean	2-tail Prob.
1) Revenues in 1987	2.21	3.75	.002
2) Book value of asset base in 1987	2.22	3.14	.019
3) Number of employees overseas	2.53	3.14	.304
4) Growth rate over last 5 years	2.53	2.82	.523
5) Revenues from overseas in 1987	2.55	3.25	.139
6) Number of full-time employees	2.96	4.44	.010
7) Year business started	3.79	4.69	.186

* refer to Tables 2-9 for meanings of each mean.

There seems to be a positive relationship between a company's innovativeness and its size, its revenue, and its capital. This is not surprising, for Tables 12 and 18

show that security innovation is expensive and that it costs too much for some investment houses. Hence, it is clear that large companies find it easier to manage security innovations than do smaller companies. This finding corroborates the findings of previous research (i.e., Crawford 1983, Daft and Becker 1978). No significant relationship was found between company innovativeness and its number of years in business, its growth rate, and its internationality.

Table 32 deals with the relationship between company innovativeness and the strength of underwriting, wholesale brokerage, and risk management.

Table 32
Company's Innovativeness and Nature of Business

	Innovators Mean	Non-innovators Mean	2-tail Prob.
1) Underwriting	1.57	3.38	.000
2) Wholesale Brokerage	1.83	2.94	.005
3) Corporate Finance	2.17	2.81	.119
4) Retail Brokerage	2.27	2.53	.623
5) Risk Management	2.52	3.40	.030

As can be seen, there seems to be a positive relationship between company innovativeness and underwriting, wholesale brokerage, and risk management. The fact that "underwriting" recorded the strongest positive relationship with company innovativeness corroborates the findings of the previous section which concluded that corporate customers' financial concerns may be the principal idea source for security innovations. This finding itself is a positive sign, considering the fact that security innovation implies an underwriting activity.

It goes without saying that clients of a wholesale brokerage are corporate customers, whereas clients of a retail brokerage are small personal investors. Hence, it is

not surprising that there is a significant correlation between wholesale brokerages and company innovativeness. Retail brokerages do not figure in this correlation.

Literature in the area of finance (i.e., Finnerty 1987, Silber 1983, A Study of Group of Central Banks of the Group of Ten Countries 1986) claims that one of the causes of security innovations is the reduction of risk. Hence, financial knowledge and techniques for risk reduction may help to generate security innovations. This may explain why there is a positive relationship between risk management and company innovativeness. This finding corroborates the finding that one of the reasons not to innovate security innovations is "uncertain/risky" (see Table 18).

To further examine the systematic relationship between company innovativeness and the demographics/nature of business, an ANOVA with Tukey Tests for pairwise differences was conducted among three groups: AI, ANI, and NANI (the same as in the case of Table 19). The level of significance accepted for this analysis is $\alpha \leq .05/67$ variables = .00075. Also comments are made when $\alpha \leq .05$. Table 33 summarizes the findings.

Table 33
Differences Among the Three Groups
The Demographics and the Nature of the Business

	AI (24) mean	ANI (9) mean	NANI (9) mean	level of signifi- cance	Pairs of groups signifi- cantly different
demographics					
number of full-time employees	5,028.81	1,251.00	811.13	.0125	AI-NANI
nature of business					
underwriting	1.59	4.00	3.25	.0000	AI-NANI AI-ANI
wholesale brokerage	1.77	2.33	3.63	.0008	AI-NANI

As can be seen, there are significant differences in terms of the number of full-time employees between AI companies and NANI companies. Also, in terms of the nature of the business, there were significant differences in underwriting and in wholesale brokerage. These findings corroborate those presented in Table 32.

In summary, the factors which distinguish innovative companies from non-innovative ones are: the number of employees, revenue, capital, and the nature of the business.

7. SUMMARY AND IMPLICATIONS

7-1: Summary

This study examined security innovations and security innovators. The objectives were to classify and to characterize security innovations, to determine why security innovators generate security innovations, and to identify significant differences which separate innovators from non-innovators.

In order to examine the attributes of security innovations and the purpose of security innovations, literature in the area of financial innovations was reviewed. However, since virtually no empirical research specifically addressing why and how investment houses generate security innovations exists, literature in the area of product innovation was also reviewed, in order to examine the general attributes of innovations, the purpose of innovations, internal and external prerequisite environments for innovating, and management's role in generating innovations.

The methodology used in this research can be said to be an exploratory survey. To this end, 43 corporate finance vice presidents (or CEOs) in investment houses from four stock exchanges (Toronto, London, New York, and Tokyo) were surveyed, using a self-completed questionnaire. Appendix B contains a description of the linkage between the research questions, the questionnaire, and subsequent analysis methods.

Security Innovations

It was found that there was no clear consensus among respondents about what constitutes security innovations and how to classify security innovations on the newness

dimension. Respondents attributed the following characteristics of and concerning security innovations:

- 1) there is an advantage to being first to market
- 2) security innovations require an experience curve
- 3) security innovations require time
- 4) security innovations are planned rather than occurring by accident
- 5) security innovations are not patentable
- 6) security innovations are easy to duplicate
- 7) the market share changes quickly
- 8) security innovations are not easy to market

Security Innovators

Respondents assume most U.S. companies to be significantly innovative. They do not consider investment houses in other countries to be innovative, except for a couple of major companies in Japan and in Great Britain.

Almost 80% of respondents agreed that they are aiming to innovate. It may be said that respondents show an aggressive posture towards generating security innovations. This may be because there is an advantage to being the first to market. Close to 60% of respondents consider themselves to be innovative. Based on these two points, the 43 respondents are categorized into four groups, namely AI, ANI, NANI and NAI

Reasons for Generating and not Generating Security Innovations

Reasons to innovate, supported by respondents, are that:

- 1) security innovation is to protect and to expand the customer base
- 2) security innovation is a profitable/high margin business
- 3) security innovation is for fame/corporate image
- 4) security innovation is customer driven

On the other hand, reasons not to innovate, supported by respondents are that:

- 1) security innovation is time-consuming
- 2) security innovation is risky/uncertain
- 3) some investment houses do not have experience
- 4) security innovation costs too much

It should be noted that respondents agree that one of the characteristics of security innovation is non-patentability. However, note that respondents who are not aiming to innovate reject this as a reason not to innovate. As well, innovative companies agree that one of the reasons to innovate is for "fame/corporate image". Non-innovative companies neither agree nor disagree on these points.

Organizational Characteristics and Environment for Fostering Security Innovations: Separating Innovative Companies From Non-Innovators

The most significant differences which separate innovative companies from non-innovators were in the idea generation process, specifically, the idea source, the idea generation phase, the internal environment/climate, and management's attitude/strategy in supporting this process. The factors which distinguish innovative companies are that:

- 1) a variety of idea sources, both internal and external, are used for idea generation (i.e., monitor industry, regularly contact customers)
- 2) there exists a specific person/group who is in charge of developing new ideas
- 3) lower-rank employees, as well as executives, are encouraged to generate ideas
- 4) techniques to stimulate new ideas are used in the group which is responsible for innovation (e.g., brainstorming)
- 5) employees are rewarded non-monetarily rather than monetarily
- 6) the decision to implement/select innovations is made in a group
- 7) management has an innovation strategy and it defines the market segment that new security should attract.

The above points are not the case for non-innovative companies. This finding is not surprising, considering the nature of security innovations, which are ideas rather than material products and which therefore do not require a manufacturing process.

It was found that ANI companies have a higher tendency to be tolerant of risk and uncertainty than AI companies, and that ANI companies have a higher tendency to reward monetarily than AI companies. AI companies have a higher tendency to reward non-monetarily than ANI companies. As well, ANI companies have a higher tendency to have team players than AI companies.

Finally, AI companies have personnel with M.A.'s or Ph.D.'s involved in the scientific area as well as in the business area of the innovation process. Also, AI companies accept ideas from both younger and older people for generating innovations. This is not the case for other company groups.

Relationship Between Company Innovativeness and Demographics/Nature of Business

A significant correlation was found between company innovativeness and the revenue, the number of full-time employees, and the book value of the asset base. This corroborates the findings of previous research (Crawford 1983). No relationship was found between company innovativeness and growth rate, number of years in business, and internationality. This contradicts previous research (Daft and Becker 1978). A significant correlation was discovered between company innovativeness and the strength of the business in terms of underwriting, wholesale brokerage, and risk management.

7-2: Security Innovations and Product Innovations

Having summarized findings about security innovations and innovators, this study now examines how security innovations are different from general product innovations in terms of nature/characteristics, reasons to innovate, and environments and organizational characteristics for fostering innovations.

There is no empirical research which specifically addresses the nature of product innovations. In general, the researcher has concentrated on examining product innovation on the "newness" dimension and an attempt to categorize a new product according to improvements in functionality and creativity. The assumption has always been that products are tangible, manufactured goods and their newness can be described by their physical characteristics. Thus, no readily comparable research exists to validate the findings of this research on security innovations. It seems that the two main characteristics that are exhibited by security innovations that distinguish them from product innovation are the lack of patentability and the apparent ease with which they can be duplicated. These two characteristics imply that, in contrast to the product innovation

which requires elaborate manufacturing process, security innovators must continually seek new innovations or find other ways to protect their innovative ideas.

Some empirical research is available in the product innovation area which attempts to identify the reasons why some companies innovate. No research addresses the reasons for not innovating, as the research has mainly concentrated on innovators. In addition, the reasons to innovate vary depending on the specifics of the research study. The main reasons to innovate include quality of the product, cost reductions, and contributions to the employee, company, and society in general. Whereas, this research has found that the main reasons to generate security innovations are mainly to protect and expand customer bases and because they are profitable. Cost reduction motive, especially, seems to be an inappropriate concept in the case of security innovations which are ideas rather than material products and, therefore, do not require investments in the manufacturing process. The significant requirements of computers and marketing of the innovation to company's clients do not seem to be major barriers for the introduction of the innovation to the clients.

The differences between the management of security innovations versus the management of general product innovations can be summarized as follows: In the case of general product innovations, the innovation process is portrayed as circular, with every phase stated as being equally important. In general, the research claims that all phases (management attitude/strategy, climate/environment for innovation, idea generation, idea source, organization, personnel, budget, selection/proposal requirement, and implication) are interlinked and cannot be managed independently. For example, Kamm (1987) claims that all phases of innovation management are linked and are considered equally important. In the case of security innovations the management attention seems to be most critical for the idea generation phase. Other phases of the innovation process do not seem to be very important. This result is not really very

surprising, given the fact that security innovations correspond to an idea or a concept rather than a tangible manufactured product.

Once the idea generation process results in a security innovation, the next phase of the innovation process seems to be relatively straight forward and managed with relative ease by the company. This, clearly, is the single most important difference between the security innovations and product innovations. As stated in the next subsection, this difference has important implications for management.

In terms of the relationship between company innovativeness and demographics, there seems to be no significant difference between security innovators and general product innovators. For both parties, the correlation is positive. This may be because, as this research has found, security innovations require a lot of time and money, for example, on personnel and computers.

7-3: Implications and Limitations of Research

Implications for Management

The findings and discussions included in this thesis provide some clear guidelines for managers and the management community of investment houses. Management should understand that the key phase of the innovation process is the idea generation stage. They should use a variety of idea sources, both internal and external, for idea generation, and there should be someone in charge of implementing new ideas. Management should also encourage employees at all levels to generate ideas. Brainstorming should be used as a technique to stimulate the generation of new ideas. Management should reward employees non monetarily as well as monetarily. They should decide to implement or select innovations as a result of group decision-making.

Management should have an innovation strategy and should define the market segment that the new security should attract.

In terms of personnel, management should involve both Ph.D.'s and M.A.'s in scientific positions, as well as in business positions, related to the innovation process. All employees, regardless of age, should be encouraged to generate ideas and innovations.

Management must also understand that security innovations require time and experience, that they are expensive to implement, and that they are risky. Furthermore, innovations are not, in general, patentable, so others may readily duplicate new products.

It should be remembered that there is a significant advantage to being first to hit the market. Also, innovations do not occur simply by accident: so management must be eager to generate innovations. Security innovations expand and protect the customer base and are a profitable high margin business, contributing also to increasing the corporate image. Hence, management should hold an aggressive posture with regard to generating innovations.

Management should also note that there is a positive relationship between innovativeness and company size, resources, and strength of underwriting and wholesale business. If a company is not large or strong in the above areas, it may have difficulty in achieving success by implementing security innovations.

Limitations of Research

This research study has two main limitations. The first is its low response rate. As mentioned in sub-section 6-2, the respondents are well distributed in terms of their size, book value, number of years in business, resources, and locations. However, the response rate of this study (17.9%) might seem low compared with other response rates

to mail surveys (e.g., Tull and Hawkins, 1987, who had response rates from 13 percent to 75 percent, depending on the respondents' interest in the subject matter of the survey).

It is possible that in the data collection phase, the more informed participants responded to the survey, whereas the less informed participants did not. Innovators and imitators responded, but those involved in neither activity did not. If this is indeed the case, then it would render the sample biased towards the "movers", those people who instigate change within the financial industry. This situation is difficult to validate, due to the scarcity of previous research for comparison purposes.

The second limitation of this research is the lack of previous research in this area. This lack prevents measurement scales from establishing content validities. As the purpose of this research is to provide, for the first time, empirical research on security innovations and innovators in a framework consistent with general innovation research, the goal of this study is necessarily exploratory and descriptive, and the purpose of the analysis is discovery rather than hypothesis testing.

Implications for Further Research

This is the first study to examine security innovations as intangible services, rather than material products. Hence, this research will guide further research towards innovating intangible products or services, particularly in tertiary industry or in the service-producing industry, which is competitive and growing yearly.

One area that this research did not explore, but which seems to be a logical extension of the study, is an examination of the international comparison. Finance literature suggests that three of the important causes of security innovations are regulatory systems, tax law changes, and the internationalization of the financial market. It goes without saying that every country has its own regulatory system and tax laws, and the

capital market is growing more and more international every year. Furthermore, corporate culture varies from country to country; hence this area will be worth studying in the future. Note that though the above area could be examined at least theoretically by this study, we decided that because of the small sample size it would be best addressed by a future study.

8: REFERENCES

- Consumer and Corporate Affairs Canada. Patents: Questions and Answers. 1986.
- Cosenza, Davis. Business Research for Decision Making. Belmont, California: 1985.
- Crawford, C. Merle. New Products Management. Irawin, Illinois: 1983.
- Daft, Richard L. Organization Theory and Design. New York: 1986.
- Daft, Richard L. and Selwyn W. Becker. Innovation in Organizations. Elsevier, Oxford, New York: 1978.
- Deshpande, Shreesh D. and Vijay M. Jog. "Further Evidence on Market Efficiency: Evidence from Stripped Commons": 1987 (unpublished).
- Deshpande, Shreesh D. and Vijay M. Jog. "Money Market Preferreds and Bidding Strategies": 1987 (unpublished).
- Evan, William M. and Guy Black. "Innovation in Business Organizations: Some factors associated with success or failure of staff proposals", The Journal of Business, (40), pp. 519-530: 1967.
- Finnerty, John D. "An Analytical Framework for Evaluating Securities Innovations": September 1987 (unpublished).
- Frankel, Allen B. and Catherine L. Mann. "A Framework for Analyzing the Process of Financial Innovation", International Finance Discussion Papers Number 283: 1986.
- Gobeli, David H. and Daniel J. Brown. "Analyzing Product Innovations", Research Management: July-August 1987, pp. 25-31.
- Jog, Vijay M. "Financial Innovations and Regulatory Dialectics - The Genstar Case", (unfinished).

- Kamm, Judith B. An integrative approach to managing innovation: 1987.
- Kane, Edward J. "Accelerating Inflation, Technological Innovation, and the Decreasing Effectiveness of Banking Regulations," The Journal of Finance, Vol. XXXVI, No. 2: May 1981, pp. 355-367.
- Marshall, J. Judith. "Innovation adaption in industrial sales organizations: a field study of the post adaption phase in the case of telemarketing," Ph.D. Thesis: 1985.
- Miller, Merton H. "Financial Innovation: The Last Twenty Years And The Next," Journal of Financial and Quantitative Analysis, Vol. 21, No. 4: December 1986, pp. 459-471.
- Mohr, Lawrence B. "Determinants of Innovation in Organization," American Political Science Review, (63): 1969, pp. 111-126.
- New York Stock Exchange, Inc. Fact Book 1988. New York, U.S.A.: 1988.
- Nomura Research Institute (NRI). The World Economy and Financial Markets in 1995. pp. 26-51. Tokyo, Japan: 1986.
- Norusis, J. Marija. The SPSS Guide to Data Analysis. U.S.A.: 1986.
- Rogers, Everett M. Diffusion of Innovations. Second Edition, New York: 1968.
- Rogers, Everett M. Diffusion of Innovations. Third Edition, New York: 1971.
- Rogers, Everett M. and F. Floyd Shoemaker. Communication of Innovations. Second Edition. Collier-Macmillan Ltd., New York: 1971.
- Silber, William L. "The Process of Financial Innovation," AES Papers and Proceedings: May 1983, pp. 89-95.

Smyth, David J., William J. Boyes, and Dennis E. Peseau. SPSSX Users' Guide. SPSSX, Inc. McGraw-Hill, U.S.A.: 1983.

A Study Group established by the Central Banks of the Group of Ten Countries. Recent Innovations in International Banking. New York: April 1986.

Tull, S. Donald and Del I. Hawkins. Marketing Research — Measurement and Method. Fourth Edition, U.S.A.: 1987.

Van Horne, James C. "Of Financial Innovations and Excesses," The Journal of Finance. Vol. XL, No. 3: July 1985, pp. 621-631.

Williams, Terrell G. Consumer Behavior. West Publishing Company, New York: 1982.

Zaltman, Gerald , Robert Duncan and Jonny Holbek. Innovations and Organizations. A Wiley-Interscience Publication, New York: 1973.

Zmud, Robert W. "Diffusion of Modern Software Practices: Influence of Centralization and Formalization," Management Science. (28): 1982, pp. 1421-1431.

9: APPENDICES

APPENDIX A LIST OF FINANCIAL INNOVATIONS AND SOME BASIC FINANCE TERMS

A-I: List of Financial Innovations (Miller (1986))

negotiable CDs
Eurodollar accounts
Eurobonds
sushi bonds
floating-rate bonds
puttable bonds
zero coupon bonds
stripped bonds
options
financial futures
options on futures
options on indexes
money market funds
cash management accounts
income warrants
collateralized mortgages
home equity loans
currency swaps
floor-ceiling swaps
exchangeable bonds

2 OF/DE 2

MicroD

A-II: List of Financial Innovations
 (A Study Group established by the
 Central Banks of the Group of Ten Countries (1986))

A classification of innovations by financial intermediation function

Innovation	Function				
	Price-risk-transferring	Credit-risk-transferring	Liquidity-enhancing	Credit-generating	Equity-generating
A. On-balance-sheet					
Adjustable rate mortgages	√				
Floating rate loans	√				
Back-to-back loans	√				
Asset sales without recourse		√			
Loan swaps		√			
Securitized assets		√	√		
Transferable loan contracts		√	√		
Sweep accounts and other cash management techniques			√		
Negotiable money-market instruments			√		
Money-market mutual funds			√		
Zero coupon bonds				√	
"Junk" bonds				√	
Equity participation financing				√	
Mandatory convertible debentures					√
B. Off-balance-sheet					
Futures	√				
Options and loan caps	√			√	
Swaps	√				
Forward rate agreements	√				
Letters of credit		√			
Note issuance facilities	√	√	√		
Credit-enhancing guarantees on securities		√	√		

A-III: List of Financial Innovations (Silber (1983))
Financial Innovations: 1970-1982

Types	Exogenous Causes*					
	(a)	(b)	(c)	2	3	4
A. Cash Management						
1. Money Market Mutual Funds	✓					
2. Cash Management/Sweep Accounts	✓				✓	
3. Money Market Certificates	✓					✓
4. Debit Card	✓				✓	
5. NOW Accounts	✓					
6. ATS Accounts	✓					✓
7. Point-of-Sale Terminals					✓	
8. Automated Clearing Houses					✓	
9. CHIPS (Same Day Settlement)					✓	
10. Automated Teller machines					✓	
B. Investment Contracts						
(i) Primary Market						
1. Floating Rate Notes				✓		
2. Deep Discount (Zero Coupon) Bonds	✓		✓	✓		
3. Stripped bonds	✓		✓	✓		
4. Bonds with Put Options or Warrants	✓			✓		
5. Floating Prime Rate Loans				✓		
6. Variable Rate Mortgages				✓		
7. Commodity Linked (Silver) Bonds				✓		
8. Eurocurrency Bonds	✓					✓
9. Interest Rate Futures				✓		
10. Foreign Currency Futures						✓
11. Cash Settlement (Stock Index) Futures						✓
12. Options on Futures				✓		✓
13. Pass-Through Securities						✓
(ii) Consumer-Type						
1. Universal Life Insurance				✓		
2. Variable Life Policies		✓				
3. IRA/Keogh Accounts			✓			✓
4. Municipal Bonds Funds			✓			✓
5. All-Saver Certificates	✓					✓
6. Equity Access Account		✓		✓		
C. Market Structures						
1. Exchange-Traded Options						✓
2. Direct Public Sale of Securities						
Green Mountain Power Co				✓		
Shelf Registration				✓		✓
3. Electronic Trading						
NASDAQ					✓	
GARBAN					✓	
4. Discount Brokerage						✓
5. Interstate Depository Institutions					✓	✓
D. Institutional Organization						
1. Investment Bankers/Commodity Dealers	✓			✓		
Salomon/Hubro, Goldman						
Sachs/J. Aron, DLJ/ACLI						
2. Brokers/General Finance						✓
Shearson/Amex, Bache/						
Prudential, Schwab/Bank of America						
3. Thrifts with Commercial Banks	✓			✓		✓
4. Financial Centers (Sears Roebuck)						✓

*Column headings: 1. Inflation: (a) Level of Interest Rates, (b) General Price Level, (c) Tax Effects; 2. Volatility of Interest Rates; 3. Technology; 4. Legislative Initiative; 5. Internationalization; 6. Other

A-IV: List of Financial Innovations (Van Horne (1985))**A Partial Listing of Recent Financial Innovations
(1978-1984)**

	Primary Cause*
Products	
Money market investment accounts	1,2
Super NOW accounts	1,2
Interest rate and stock index futures markets	1,2,6
Options on futures contracts	1,2,6
Municipal bond mutual funds	1,3
Zero coupon bonds and coupon stripping	1,6
Adjustable rate preferred stock	1,3
New variations of adjustable rate mortgages	1,2,6
Securitization of pass-through and other mortgages	1,2,5
IRA accounts	3
Universal life insurance policies	1
Currency option loans	1
Interest rate swaps and currency swaps	1
Forward interest rate loan contracts, with ceilings and floors	1
Bonds with put options	1,3
Issuance of and investment in high-yield (junk) bonds	1,6
Processes	
Automatic teller machines	2,4
Point-of-sale terminals	4
Financial transactions by personal computer	4
Shelf registrations	2
Electronic security trading	2,4
Electronic funds transfer	4
New variations in credit card processing	4

*Cause notation: 1. volatile inflation and interest rates; 2. regulatory;
3. tax law change; 4. technological advance; 5. level of economic activity;
and 6. academic work.

A-V: List of Financial Innovations (Finnerty (1987))**(i) Debt Innovations**

Zero Coupon Bonds
Serial Zero Coupon Bonds
Stripped Treasury Securities
Stripped Municipal Securities
Adjustable Rate Notes and Floating Rate Notes
Extendible Notes
Variable Coupon Renewable Notes
Puttable Bonds and Adjustable Tender Securities
Medium-Term Notes
Negotiable Certificates of Deposit
Mortgage Pass-Through Certificates
Collateralized Mortgage Obligations (CMOs)
Stripped Mortgage Backed Securities paper
Receivable Backed Securities
Commercial Real Estate Backed Bonds
Yield Curve Notes and Maximum Rate Notes
Interest Rate Caps
Auction Rate Notes
Floating Rate Tax-Exempt Revenue Bonds
Euronotes and Euro-commercial paper
Interest Rate Swaps
Dual-Currency Bonds
Indexed Currency Option Notes
Bonds linked to commodity or index
Credit-enhanced debt securities
Variable Duration Notes
Annuity Notes
Warrants to purchase debt securities

A-V (Continued): List of Financial Innovations (Finnerty (1987))

(ii) Stock Innovations

Adjustable Rate Preferred Stock

Convertible Adjustable Preferred Stock

Auction Rate Preferred Stock (MMP/DARTS/AMPS)

Single Point Adjustable Rate Stock

(iii) Convertible Debt/Preferred Stock Innovations

Convertible Exchangeable Preferred Stock

Adjustable Rate Convertible Debt

Zero Coupon Convertible Debt

Debt with Mandatory Common Stock Purchase Contracts

Synthetic Convertible Debt

(iv) Common Equity Innovations

Master Limited Partnership

Second Class of Common Stock

A-VI: List of Financial Innovations (Nomura Research Institutes (1986))

(i) new product: MMF, MMDA, future, etc.

(ii) delivery system: credit card, ATM, POS, etc.

(iii) development of new market: Eurodollar, Eurobond, etc.

(iv) organization form: bank holding company, non-bank bank, financial conglomerate, capital market group, etc.

(v) organizational forms: Cash Management Account, joint ventures, joint service agreement for shared ATM, etc.

A-VII: Some Basic Finance Terms

- (1) **CURRENCY FUTURES:** contract in the futures markets for delivery in a major currency such as U.S. dollars, British pounds, French francs, German marks, Swiss francs, or Japanese yen. Corporations which sell products around the world can hedge their currency risk with these futures.
- (2) **FLOATING RATE NOTE:** debt instrument with a variable interest rate. Interest adjustments are made periodically, often every six months, and are tied to a money-market index such as Treasury bill rates. Floating rate notes usually have a maturity of about five years. They provide holders with protection against rises in interest rates, but pay lower yields than fixed rate notes of the same maturity.
- (3) **FUTURES:** contracts made in a 'future market' for the purchase or sale of commodities on a specified future date. Many commodity exchanges, e.g. wool, cotton, and wheat, have established futures markets which permit manufacturers and traders to hedge against changes in prices of the raw materials they use or deal in.
- (4) **Money Market Preferred stocks (MMPs):** a recent innovative financial product with over \$6.5 billion in total issues placed. The main distinguishing characteristic of MMPs is that the dividend rate is determined by a periodic 'Dutch-Auction' process. This is in contrast to Floating Rate Notes (FRNs), Adjustable Rate Preferred Stock (ARPs), and Yield curve notes, where the interest or the dividend rate is pegged to aggregate macro-economic variables, such as the T-bill rate or the LIBOR.
- (5) **NEGOTIABLE CERTIFICATE OF DEPOSIT:** Large-dollar amount, short-term certificate of deposit. Such certificates are issued by large banks and are bought mainly by corporations and institutional investors. They are payable either to the bearer or to the order of the depositor, and, being negotiable, they enjoy an active secondary market, where they trade in round lots of \$5 million. Although they can be issued in any denomination from \$100,000 up, the typical amount is \$1 million. They have a minimum original maturity of 14 days; most original maturities are under six months.

- (6) **OPTION:** An option is simply a contract involving a buyer (called a holder) willing to purchase specific rights and a seller (called a writer) willing to grant those rights in return for the premium. The purchase of an option conveys to the holder (buyer), for the stated period, certain rights concerning the underlying security covered by that option. The writer (seller) of the option grants those rights in return for the premium (price of the option) received from the buyer. Thus a buyer has a right, and the seller has an obligation.
- (7) **PRIMEs and SCOREs:** Since 1983, the Americus Shareowner Service Corporation has sponsored individual trusts for shares of selected blue-chip firms. The purpose of these trusts is to "strip" common shares and to offer investors two new types of securities - PRIMEs and SCOREs. The former is mainly a claim on dividends paid on the underlying common share, and the latter is a claim on capital gains over and above a pre-specified dollar value. This stripping of the original common share (hence the term 'stripped' common) into the PRIME and SCORE implies that unit holders can now "separate the potential for capital appreciation above a stipulated dollar amount from the right to receive dividends and all other attributes of ownership of shares."
- (8) **STRIP BONDS:** brokerage-house practice of separating a bond into its corpus and coupons, which are then sold separately as zero-coupon securities. The 1986 U.S. Tax Act permitted municipal bond strips. Some, such as Salomon Brothers' tax-exempt M-CATS, represent prerefundings backed by U.S. Treasury securities held in escrow. Other strips include Treasuries stripped by brokers, such as Tigers, and stripped mortgage-backed securities of government-sponsored issuers like Fannie Mae. A variation, known by the acronym STRIPS (Separate Trading of Registered Interest and Principal of Securities), is a prestripped zero-coupon bond that is a direct obligation of the U.S. Treasury.
- (9) **SWAP:** exchange one security for another. A swap may be executed to change the maturities of a bond portfolio or the quality of the issues in a stock or bond portfolio or the quality of the issues in a stock or bond portfolio, or because investment objectives have shifted. Investors with bond portfolio losses often swap for other higher-yielding bonds to be able to increase the return on their portfolio and to realize tax losses.

- (10) **ZERO-COUPON BOND:** a bond in which no interest coupons are paid to the bondholder. Instead, the bond is purchased at a very deep discount and matures at par. The difference between the original issue discount price and par represents a specified compounded annual yield.

APPENDIX B

LINKAGE OF RESEARCH QUESTIONS, THE QUESTIONNAIRE, AND DATA ANALYSIS

Research Questions	Variables	# of Questionnaire	Data Analysis
(1) Is there a way to classify security innovations in a framework consistent with product innovation research? What is the consistency in the classification and categorization of security innovations across informed capital market participants?			
(i) What do they consider as security innovations?	-lists of security innovations	1, 2	qualitative analysis and frequency
(ii) How do they classify security innovations on the "newness" dimension?	-newness of security innovations		qualitative analysis and frequency
(iii) How do they characterize security innovations	-time to duplicate -easiness to duplicate -cost, time, patentability intangibility, idea v.s. material, experience curve, short life cycle, temporary market share, advantage to be first to the market, easiness to market, legal complexity, demand pulled/supply pushed, programmed/non programmed	3	# of times cited, means, percentages
(2) What are the reasons for generating security innovations by innovators?			
(i) Who do informed market participants consider as innovators and non-innovators? How do they consider themselves on the "innovativeness" dimension?	-innovativeness evaluated by the market participants -names of innovators -degree of spirit to innovate -self evaluation -# of innovation they made -satisfaction	4, 5 6 8, 9 7	# of times cited, means, rankings, frequency of rating
(ii) Why do some aim to innovate and others do not?	-the reason to innovate -the reason not to innovate	11 12	# of times cited, means, rankings, frequency of rating, t-test, ANOVA with Tukey test.

B. Linkage of Research Questions, The Questionnaire, and Data Analysis (Cont'd.)

Research Questions	Variables	# of Questionnaire	Data Analysis
(3) Are there significant differences in the characteristics of the organizational structures and the environments for innovators and non-innovators? If so, what characteristics are most significantly different?	-management attitude/strategy	19	t-test, ANOVA with Tukey test to identify significant variables which separate innovators from others
	-climate/environment	13	
	-idea generation	14	
	-idea source	15	
	-organization	16	
	-personnel	17	
	-budget	18	
	-selection, proposal requirement	20	
	-implementing		
(4) Is there a systematic relationship between a company's innovativeness and its size, capital, resources, locations, and organization structures?	-# of years in business	21	t-test, ANOVA with Tukey test to identify significant variables which separate innovators from others
	-# of full time employees	22	
	-capital (book value)	27	
	-# of employees in overseas	23	
	-location of the headquarters	28	
	-revenues total	24	
	-revenues from overseas	25	
	-growth rate	26	
	-nature of business	29	

APPENDIX C
A SURVEY OF
SECURITY INNOVATIONS
AND
INNOVATORS

Conducted by:

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BACKGROUND

This research is being carried out by Akira Iwamura, a graduate student in Management Studies at Carleton University as part of his Master's thesis, under the supervision of Professor Vijay M. Jog.

Security innovations have produced significant changes in the capital market, and will continue to flourish and experience noticeable growth. The purpose of this project is to provide, for the first time, empirical research on by whom, why and how security innovations are created, marketed and maintained. The project involves a survey of the CEOs/CFOs of the investment houses all over the world.

DEFINITION

Security innovation: new security. An innovative investment contract used for corporate financing.

Your cooperation in this research project is greatly appreciated.

Would you like a copy of the final research project?

Yes ____ (please attach business card)

No ____

Part A-I — *The following questions are designed to determine what constitutes security innovations, and to determine the characteristics of security innovations.*

1. Here is a list of security innovations. Please indicate your view on the newness of each security at the time it was first introduced by circling a number from 1 to 5 where 1 signifies very new and a 5 signifies not new at all.

Security innovations

	very new				not new don't at all know	
1) negotiable CDs	1	2	3	4	5	0
2) floating rate bonds	1	2	3	4	5	0
3) zero coupon bonds	1	2	3	4	5	0
4) stripped bonds	1	2	3	4	5	0
5) heaven and hell bonds	1	2	3	4	5	0
6) Commodity Linked Bonds	1	2	3	4	5	0
7) exchangeable bonds	1	2	3	4	5	0
8) interest rate swaps	1	2	3	4	5	0
9) currency swaps	1	2	3	4	5	0
10) floor-ceiling swaps	1	2	3	4	5	0
11) adjustable rate preferred stock	1	2	3	4	5	0
12) money market preferred	1	2	3	4	5	0
13) Scores and Primes	1	2	3	4	5	0
14) LYONs	1	2	3	4	5	0
15) Unbundled Stock Unit	1	2	3	4	5	0

2. If you would like to add to this list, please indicate the names of up to 5 security innovations and indicate the newness of each of them at the time it was first introduced by circling a number from 1 to 5 where 1 signifies very new and 5 signifies not new at all.

Security innovations	very new				not new at all	
1) _____	1	2	3	4	5	
2) _____	1	2	3	4	5	
3) _____	1	2	3	4	5	
4) _____	1	2	3	4	5	
5) _____	1	2	3	4	5	

3. Here are some ways in which security innovations may be characterised. In your point of view, how are these characteristics relevant to describing security innovations? Please indicate your level of agreement by circling a number from 1 to 5 where 1 signifies strongly agree and 5 signifies strongly disagree.

	strongly agree			strongly disagree	
1) Security innovations are expensive	1	2	3	4	5
2) Creation of security innovations requires a lot of time	1	2	3	4	5
3) Security innovations are substantially patentable	1	2	3	4	5
4) Security innovations are intangible, in other words, just ideas rather than material	1	2	3	4	5
5) Generating security innovations requires an experience curve	1	2	3	4	5
6) Most security innovations have a short life cycle	1	2	3	4	5
7) Market shares of security innovations are quickly changing and unstable	1	2	3	4	5
8) There seems to be substantial advantage to be the first to the market with a security innovation	1	2	3	4	5
9) Security innovations are easy to market	1	2	3	4	5
10) Security innovations are generally demand pulled innovations (customers demand) rather than supply pushed innovations (technical breakthrough)	1	2	3	4	5
12) Security innovations occur more by accident rather than being planned	1	2	3	4	5
13) Security innovations are easy to duplicate	1	2	3	4	5

Part A-II — *The following questions are designed to categorize investment houses in terms of innovativeness.*

4. Here is a list of investment houses in four countries. Please evaluate innovativeness of each of these investment houses in terms of security innovations. (Please circle the appropriate number)

	very innovative			not innovative at all		can't say
Canada						
1) Burns Fry	1	2	3	4	5	0
2) City Bank, Canada	1	2	3	4	5	0
3) Gordon Capital	1	2	3	4	5	0
4) Levesque, Beaubien, Geoffrion	1	2	3	4	5	0
5) Nesbitt Thomson Deacon	1	2	3	4	5	0
6) RBC Dominion Securities	1	2	3	4	5	0
7) Richardson Greenshields	1	2	3	4	5	0
8) Scotia McLeod	1	2	3	4	5	0
9) T.D. Bank	1	2	3	4	5	0
10) Wood Gundy	1	2	3	4	5	0
Great Britain						
11) Hambros	1	2	3	4	5	0
12) Hill Samuel Group	1	2	3	4	5	0
13) Kleinwort Benson Lonsdale	1	2	3	4	5	0
14) Midland Mortgage (Holdings)	1	2	3	4	5	0
15) Morgan Grenfell Group	1	2	3	4	5	0
16) N.M. Rothschild & Sons	1	2	3	4	5	0
17) Schroders	1	2	3	4	5	0
18) S.G. Warburg & Co.	1	2	3	4	5	0
U.S.A.						
19) Drexel Burnham Lambert	1	2	3	4	5	0
20) First Boston	1	2	3	4	5	0
21) Goldman Sachs	1	2	3	4	5	0
22) Kidder Peabody & Co.	1	2	3	4	5	0
23) Merrill Lynch Capital Markets	1	2	3	4	5	0
24) Morgan Stanley	1	2	3	4	5	0
25) Salomon Brothers	1	2	3	4	5	0
26) Shearson Lehman Brothers	1	2	3	4	5	0
Japan						
27) Daiwa	1	2	3	4	5	0
28) Kokusai	1	2	3	4	5	0
29) New Japan	1	2	3	4	5	0
30) Nikko	1	2	3	4	5	0
31) Nomura	1	2	3	4	5	0
32) Yamauchi	1	2	3	4	5	0

5. If you would like to add to this list, please indicate the names of up to 5 investment houses and indicate their innovativeness in terms of security innovations, by circling a number from 1 to 5 where 1 signifies very innovative and 5 signifies not at all.

	very innovative			not innovative at all	
1) _____	1	2	3	4	5
2) _____	1	2	3	4	5
3) _____	1	2	3	4	5
4) _____	1	2	3	4	5
5) _____	1	2	3	4	5

6. In terms of innovativeness of security innovations, how would you describe your firm? Please indicate by circling a number from 1 to 5 (choose one).

very innovative			not at all innovative		can't say
1	2	3	4	5	0

7. Are you satisfied with your company's performance in the last three years in terms of generating security innovations? (Please choose the appropriate number)

definitely satisfied			totally dissatisfied	
1	2	3	4	5

8. Please indicate how many security innovations your company has launched in the last three years? Indicate this by circling a number from 1 to 5 (choose one).

1. none 2. one 3. 2-5 4. 5-10 5. more than 10

9. Please list the names of the security innovations you have mentioned above (up to 5). Also rate the degree of innovativeness (newness) of each of these by circling a number from 1 to 5.

	very new			not at all new	
1) _____	1	2	3	4	5
2) _____	1	2	3	4	5
3) _____	1	2	3	4	5
4) _____	1	2	3	4	5
5) _____	1	2	3	4	5

Part B — *The following questions are designed to determine the purpose of generating security innovations, that is, why some investment houses are aiming to innovate, while others do not.*

10. How would you describe your company's attitude towards generating security innovations? Please indicate by circling a number from 1 to 5 (choose one):

1. definitely aiming to innovate.
2. somewhat aiming to innovate.
3. innovates only when customer driven.
4. not aiming to innovate.
5. other (please specify) _____

11. "The following items may explain why some investment houses generate security innovations."

Please indicate your degree of agreement with the above statement by circling a number from 1 to 5, where 1 signifies strongly agree and 5 signifies strongly disagree.

	strongly agree			strongly disagree	
1) high margin/profitable	1	2	3	4	5
2) protect and expand customer base	1	2	3	4	5
3) cost reduction	1	2	3	4	5
4) customer driven/relationship	1	2	3	4	5
5) enhance human growth and employee potential within the company	1	2	3	4	5
6) fame, corporate image	1	2	3	4	5
7) others (please specify) _____					

12. "The following items may explain why some investment houses do not generate security innovations". (Please circle the appropriate number)

	strongly agree			strongly disagree	
1) cost too much	1	2	3	4	5
2) time consuming	1	2	3	4	5
3) uncertain/risky	1	2	3	4	5
4) non-patentability	1	2	3	4	5
5) temporary market share	1	2	3	4	5
6) no experience curve	1	2	3	4	5
7) not profitable	1	2	3	4	5
8) others (please specify) _____	1	2	3	4	5

Part C — *The following questions are designed to determine the key factors in generating security innovations.*

13. The following statements may explain your company's internal environment/climate. (Please circle the appropriate number)

	strongly agree			strongly disagree		
1) Company's employees feel confident that their ideas are valued and receive full consideration	1	2	3	4	5	
2) Company's employees fear career damage if the ideas they propose are rejected, or are accepted but fail	1	2	3	4	5	
3) Company's employees who author new ideas that succeed are rewarded in terms of salary and bonus	1	2	3	4	5	
4) Company's reward system for the employee who contributes innovations is visible for all to see in terms of non-monetary recognition	1	2	3	4	5	
5) New ideas are criticized before they are really developed	1	2	3	4	5	
6) Company has strict deadlines for generating innovations	1	2	3	4	5	
7) There are too many oddballs and not enough team players here	1	2	3	4	5	
8) It is easier to get information that I need to develop new ideas from others in my company	1	2	3	4	5	
9) Work on innovations is generally discussed with colleagues both inside and outside of the firm	1	2	3	4	5	

14. The following statements may describe your company's idea generation phase for innovation. (Please circle the appropriate number)

	strongly agree			strongly disagree		
1) My company's internal newspaper/magazine has information on innovations	1	2	3	4	5	
2) My company sponsors in-house workshops or lectures in which outsiders (academics, consultants, analysts, journalists) present their ideas about the financial service business.	1	2	3	4	5	
3) My company encourages lower level personnel as well as higher executives for idea generation	1	2	3	4	5	
4) My company's idea generating phase is managed in a centralized manner	1	2	3	4	5	
5) My company's idea generating phase is managed in a formal manner	1	2	3	4	5	
6) In my company, a specific person/group is in charge of and continually tapping external and internal information sources for new ideas.	1	2	3	4	5	

15. The following statements may explain your company's idea sources for innovations. (Please circle the appropriate number)

	strongly agree			strongly disagree		
1) We discuss with corporate customers their financial concerns.	1	2	3	4	5	
2) We discuss with corporate customers their levels of satisfaction with existing services.	1	2	3	4	5	
3) We have a systematic procedure to regularly contact our customers and conduct interviews about their needs	1	2	3	4	5	
4) We systematically monitor financial innovations within various sectors of the financial service industry.	1	2	3	4	5	
5) We subscribe to selected out-of-town (or out-of-country) academic journals.	1	2	3	4	5	
6) We participate in "peer institution" exchange groups and/or other similar endeavours.	1	2	3	4	5	
7) My section/division/group conducts regular brainstorming sessions on possible new innovations	1	2	3	4	5	

strongly
agreestrongly
disagree

- 8) In my company, the group which is generally responsible for security innovation holds regular meetings with employees who have frequent contacts with corporate customers

1 2 3 4 5

16. The following statements may explain your company's organization. Will you please indicate your degree of agreement with the following statements by circling a number from 1 to 5.

strongly
agreestrongly
disagree

- 1) The company has sufficient communication between customer relationship managers and product line departments in the form of reports or meetings.

1 2 3 4 5

- 2) In my company, responsibility and authority for new security developments are decentralized.

1 2 3 4 5

- 3) My company commissions temporary project teams with a mandate to pursue innovation within some period defined.

1 2 3 4 5

17. This question deals with your company's personnel.

- 1) Which of the following educational background employee has contributed the most in terms of security innovations? Please rank them in order.

No. 1 _____

No. 2 _____

No. 3 _____

1. Ph.D. in Business
2. MBA
3. B.Comm. or B.A.
4. Ph.D. in non-business field
5. M.Sc.
6. B.Sc.
7. Other (specify) _____
8. Can't say

- 2) Which of the following age category employee has contributed the most in terms of security innovations? Please rank them in order.

No. 1 _____

No. 2 _____

No. 3 _____

1. 25 or younger
2. 26-30
3. 31-35
4. 36-40
5. 41 or older
6. Can't say

18. The following statements may describe your company's budgeting process concerning security innovations. (Please circle the appropriate number)

	strongly agree			strongly disagree	
1) The budget for security innovations is decided case by case rather than annually.	1	2	3	4	5
2) The budget for security innovations is not important because it is too small compared to our net income.	1	2	3	4	5
3) My company's management demonstrates tangible support for innovation through a specific budget allocation, available to support the development and testing of innovative projects.	1	2	3	4	5
4) In order to access this budget, relatively few levels of approval are required.	1	2	3	4	5

19. The following statements may explain your company's management attitude/strategy toward security innovations. (Please circle the appropriate number)

	strongly agree			strongly disagree	
1) Management defines the strategic roles that a new security should play in the market.	1	2	3	4	5
2) Management is tolerant of risk and uncertainty.	1	2	3	4	5
3) Company's management defines the priority market segment that new securities should attract.	1	2	3	4	5
4) Management does not have an innovation strategy.	1	2	3	4	5

20. The following statements may explain implementing/selection phase of security innovation in your company. (Please choose the appropriate number.)

	strongly agree			strongly disagree	
1) My firm's selection and implementation phase by innovation is managed in a centralized manner.	1	2	3	4	5
2) My firm's selection and implementation phase is managed in a formal manner.	1	2	3	4	5
3) When we decide that a new idea should be implemented, it is decided by a group of people rather than by just one person.	1	2	3	4	5
4) In order to implement an innovation, someone with prestige and authority has to act as a sponsor to promote the idea within the company.	1	2	3	4	5
5) Implementation of innovation is inexpensive.	1	2	3	4	5

Part D — *The following questions are designed to provide a brief profile of respondent firms. Remember that all information is strictly confidential and that only aggregate data will be used.*

21. When was the business started? (when did you incorporate?) _____
22. How many total (domestic and overseas) full-time employees do you have (approximately)? (exclude support staff) _____
23. How many employees do you have overseas? (exclude support staff) _____
24. What was the firm's revenues in 1987? _____
25. What were the firm's revenues from overseas in 1987? _____
26. What has been your average annual growth rate over the last five years? _____%
27. What was the approximate book value of your firm's asset base in 1987 _____
28. Where is your headquarters located? _____
29. How do you consider your firm's performance in the following areas?

	Strong				Weak
Underwriting	1	2	3	4	5
Wholesale brokerage	1	2	3	4	5
Retail brokerage	1	2	3	4	5
Corporate finance	1	2	3	4	5
Risk management	1	2	3	4	5
Other _____	1	2	3	4	5

Thank you for your cooperation.

APPENDIX D

Other Security Innovations (1 = very new; 5 = not new at all)

Security Innovations	Means	# of Valid Cases
Warrant Bonds	1	1
Step Up/Step Down Bonds	1	1
Junk Bond	1	1
Deep Discount Bonds	1	1
Dual Currency Bonds	1	1
Securitized Bonds	1	1
Index Linked Bonds	1	1
Currency Linked Bonds	2	1
High Premium High Coupon Bonds	2	1
Deferred Coupon Bonds	3	2
Repackaged Bonds	3	1
Stock Index Bonds	3	1
Survival Bonds	2	1
Double Index Puts	1	1
Nikkei Index Puts	1	2
Forward Rate Agreement	1	1
Callable Bonds with Swaption	1	1
Bank Strips	1	1
Dwipend Rentals	1	1
Partially Paid Shares	1	1
Options	1	1
Cover Warrants	1	1
Private Placement VIA Warrant	1	1
Perpetual Preferreds '89	1	1
Mortgage Backed Securities	1	1
Credit Card Receivable Backed Securities	1	1
Automobile Loan Receivable Backed Securities	1	1
PERLS/REVERSE PERLS	2	1
Bonds with Equity Warrants	2	1
Listed Tradeable Options	2	1
Bonds with Warrant	3	1
Perpetual FRN	3	1
Japanese Straight Bonds in Foreign Currency with Warrant Attached	3	1
Covered Warrant	3	1
Synthetic Floating Note	4	1
Convertible Stock Notes	4	1
Convertible Exchangeable Preferred	4	1
Deposit Notes	5	1
Annuity Notes	5	1
Variable Coupon Renewable Notes	5	1
ADR	1	1
VRN	1	1
MTNs	2	1
ADAM	3	1
CP	3	1
CMO	1	1
ZEBRA	2	1
ZIPPER	2	1
Puttable Convertibles	2	1

APPENDIX E

Other Investment Houses (1 = very innovative; 5 = not innovative at all)

Investment Houses	Means	# of Valid Cases
Security Pacific	1	2
Charterhouse	1	1
Credit Swiss First Boston	1	1
CitiCorp	1	1
Bank of Tokyo	1	1
Banker Trust	1.333	3
Morgan Guaranty Trust	1.5	2
Industrial Bank of Japan	1.5	2
Paribas	2	1
Union Bank of Switzerland	2	1
Prudential-Bache Securities	3	1

APPENDIX F

RAW DATA RELATED TO COMPANY INNOVATIVENESS

Company Code Number	Innovativeness Self- Evaluated #6 ¹	Perfor- mance #7 ²	# of Innovations Launched in the Last 3 yrs. #8 ³	Attitude Towards Innovation #10 ⁴	Names of Innovations Launched in the Last 3 Years #9 ⁵
1	2	3	1	1	-
2	4	5	2	3	Ex-warrant with swaps[5]
5	2	4	3	2	Floor ceiling swaps[2], MMP[3], Currency swaps[2]
7	1	1	3	1	Heaven & hell bonds[1], Zero Coupon bonds[1]
9	3	3	4	2	Interest-Forex-Linked Euro Yen Bond[1], Stock Index Euro-Yen Bond[2], AS/Euro Yen Bond[3], AS Floating[3], Interest Deferred Bond[4]
10	2	3	3	2	-
18	2	2	4	1	Miracle CP[2], Tandem Funds[2]
19	0	3	5	1	Miracle[2], Bull-Bear Bonds[3], Tandem Fund[2]
21	2	2	3	2	Distribution of New balance Fund[2], Distribution of Special Stock Fund[2]
22	2	4	5	2	Nikkei Average Link[3], SABRE Series[2], Warrants on JGB[2], Dual Currency bonds[2], Survival bonds[1]
39	3	4	1	2	-
41	4	3	3	2	-
42	1	2	4	1	-
45	5	3	1	2	-
67	5	3	1	4	-
70	4	5	3	2	CATS Expansion/Effectiveness[2], In-house money management[3], STYLE[2] Contingent Warrant Issue[2]
93	2	1	2	1	Nikkei-linked[1.5], Reverse Dual Currency[1.5], Step up/down bond[1.5], Heaven/hell bond[1.5], Warrant bond[1.5]
100	1	1	4	1	-
112	3	4	1	4	\$ Fund/W pay[1], Dividend Roll[1]
119	1	1	3	1	1st Variable Rate Bond for municipality in US[2], 1st Variable Rate Bond with no put[3]
128	2	3	3	2	Primes & Scores[1]
133	3	2	3	1	-
135	5	3	1	4	-
138	5	5	1	4	-
140	2	3	3	2	Bought IPO[1], Floating Rate/Fixed Rate Currency Swap[3]
147	2	2	2	1	Common share liquidity trust[1]
149	5	4	2	2	Floating ESOP[3]
151	1	1	3	1	CDN-Yen Index Notes[2], McRate 1970 option to issue debt asset fixed below the yield[2], Tax deferral Equity[2]

APPENDIX F (Cont'd.)

Company Code Number	Innovativeness Self- Evaluated #6 ¹	Perfor- mance #7 ²	# of Innovations Launched in the Last 3 yrs. #8 ³	Attitude Towards Innovation #10 ⁴	Names of Innovations Launched in the Last 3 Years #9 ⁵
159	1	4	5	1	Heaven & Hell Bonds[2], Dual Currency Bonds[2], Stock Indexed Bonds[2], Foreign Currency Indexed Bonds[1], Various Currency Swaps[2]
176	1	1	5	1	Unbundled Stock Units[1], Variable Rate CMOS[1], Convertible MMP[1], Interest Rate Caps[2], MMP[1]
177	1	1	3	1	USU's[1], Exchangeable MMP[3], Convertible MMP[2]
190	5	5	1	3	-
192	2	3	3	1	Delayed Closing Eurobonds[3], Dual Currency Converts[3], Euro with Gold Warrants[2]
224	3	4	1	2	-
230	4	4	3	3	-
244	1	2	3	3	Security Investment Holdings[1], Conv.-Pref. Shares[3], Puttable convertibles[1], Grace Fund[1], 1st Lit'l Rights issue from Netherlands[1]
400	1	1	4	1	Heaven hell bonds[2], Double Index Put[1], Swap Products[1]
401	4	4	1	3	-
402	0	4	1	3	-
403	2	4	4	1	Valuable redemption note[1]
404	2	2	4	1	Commodity Linked Bond[1], Index Linked Bond[2], Index Fund[2], Dual Currency Bond[2], Portfolio Insurance Fund[2]
405	1	1	5	1	Nikkei Hellow[1], Gold Notes[1], WTI Oil Note[1], PIANO[1], BIGS[1]
406	2	3	4	1	Rolling Convertible Preferred[2], ZEBRA[2], ZIPPER[2], VRN[1], ADAM[3]
means	2.537	2.860	3.186	1.930	
# of valid cases	41	43	43	43	
Standard Deviation	1.398	1.283	1.332	1.142	

¹ 1: very innovative 5: not innovative at all

² 1: definitely satisfied 5: totally dissatisfied 0: can't say

³ 1: none 2: one 3: 2-5 4: 5-10 5: more than 10

⁴ 1: definitely aiming to innovate 2: somewhat aiming to innovate 3: innovates only when customer driven 4: not aiming to innovate 5: other

⁵ [1]: very new [5]: not at all new

END

1|8|09|90

FIN