

Thesis  
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**LENDING TO KNOWLEDGE-BASED BUSINESSES  
IN NEWFOUNDLAND AND LABRADOR**

by

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## **ABSTRACT**

Knowledge-based businesses (KBBs) have the potential to make a significant contribution to peripheral regions with marginal economies, such as Newfoundland and Labrador. However, traditional lending approaches generally emphasize tangible collateral and historical performance. As a result, new knowledge-based firms, whose assets are primarily intangible, experience difficulty with access to financing. Financial institutions have responded by implementing specialized approaches to address the needs of KBBs. This exploratory study is designed to increase our understanding of institutional lending to KBBs, particularly at the start-up stage. Following a review of the literature a research framework was developed to explore the demand-side perspectives of entrepreneurs and the supply-side perspectives of lending institutions.

A mail survey to entrepreneurs was employed to determine the roles played by chartered banks and government agencies in financing KBBs and to ascertain entrepreneurs' perceptions of financial institutions. Results indicate KBBs experience greater difficulty obtaining financing from chartered banks. Further, KBBs perceive banks to follow traditional risk assessment processes, emphasizing collateral. Findings suggest efforts by banks to cater to KBBs have been less than successful.

Supply-side data were obtained from interviews with senior managers in banks and government agencies and from business plan reviews and follow-up interviews with account managers. Simultaneous verbal protocols were used to examine risk assessment processes in six banks and four government agencies. Hypothetical business proposals were presented to account managers for initial review and subsequent due diligence. Data obtained at two stages of assessment were analyzed using

consensus analysis, multidimensional scaling, hierarchical clustering, and standard multivariate techniques.

Findings confirm chartered banks have established specialized approaches to deal with KBBs. However, there is no evidence to indicate any differential effects on KBBs as a result of identified organizational variables. There is evidence among specialized account managers of differences in risk assessment of KBBs and of a common lending culture that reflects the needs of KBBs. Evidence of a common lending culture is also evident among traditional bankers and among government agencies that share an economic development mandate. Findings also confirm chartered banks are more concerned with financial aspects of the proposed ventures and perceive higher levels of risk than government account managers.

Overall, findings provide important insights into institutional lending and have significant implications for theory, management practice and public policy. This study is one of very few to explore lending and borrowing from the perspective of KBBs and from the perspective of government agencies. Study validity is enhanced considerably by reviewing lending decisions in context and with reference to specific proposals. The use of cultural consensus theory to examine loan evaluation and risk assessment represents a significant contribution to understanding theory on lending to KBBs.

Lending practices of chartered banks, while evolving to meet the needs of KBBs, have not met expectations and may need to be reexamined. Entrepreneurs in KBBs are advised to seek out KBB specialists to enhance the likelihood of obtaining financing. Government should take steps to ensure expertise is available to deal with KBBs and to encourage financial institutions, especially banks, to extend efforts to provide specialized assistance to the KBB sector. Finally, additional research is needed to confirm findings from this study and to increase their generalizability.

Dedicated to the memory of

Vernon R. Gorman

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# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

As traditional sectors, such as manufacturing, primary resources and construction have declined, there has been an increasing interest in the potential of firms in new “knowledge-based” sectors to serve as “engines of growth”, particularly in the computer, semi-conductor, telecommunication and biomedical industries (Beck, 1992). These so-called knowledge-based businesses (KBBs)<sup>1</sup> are especially important to peripheral regions and areas with marginal economics, since they offer the potential to overcome many of the barriers to entry and competitive disadvantages faced by traditional businesses in such regions. Nonetheless, the start-up and growth of these knowledge-intensive firms has created at least one major challenge for their owners — access to capital.

Traditionally, small and medium-sized enterprises (SMEs) have faced significant problems accessing financing. Some of these problems have been self-imposed and reflect entrepreneurs' attitudes, predispositions and knowledge, while others reflect lending and investing policies that often limit the small firm's ability to access various sources of debt and equity. Risk assessment practices, especially in the case of lending institutions, have been based on traditional models that often emphasize collateral and the track record of the entrepreneur. The major problem, especially for start-up firms in the emerging sectors of the knowledge-based economy, is that a

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<sup>1</sup> Definitions of a knowledge-based business and a knowledge-based industry are discussed in section 1.3 in this chapter.



capital-based approach to risk assessment constrains their ability to access bank financing. For many of these firms, their primary assets are intangible and difficult to value, thus failing to satisfy requirements for asset-based security. The problem is compounded for the start-up firm by the absence of any history and by the difficulties of making reliable estimates of future performance. The end result is often a mismatch between institutional guidelines and policies and the reality of the new knowledge-based firm.

In the absence of collateral to support debt financing, especially from banks, entrepreneurs rely on equity sources to finance the start-up of their ventures. However, for most new small firms, sources of equity are generally limited to the personal financial capabilities of the entrepreneur, which are easily exhausted. Public equity sources, such as the stock market, have little to offer new small firms since access generally requires an established history of earnings and demonstrated financial stability. Similarly, formal venture capital very often is directed to projects at particular stages of development (Carter and Van Auken, 1994) and to firms in specific industry sectors (Gupta and Sapienza, 1992). Further, small firms are unlikely to attract venture capital unless they require substantial amounts of capital and offer the opportunity for extraordinary returns to venture capitalists (Maier and Walker, 1987).

A growing body of evidence, compiled over the last twenty years, indicates an informal market for risk capital comprised of “business angels” is playing a significant role in financing new and expanding small firms in some jurisdictions. Beginning with the seminal work of Wetzel (1981) in the United States, others have investigated the role of business angels in the United Kingdom (Harrison and Mason, 1992; Mason and Harrison, 1994; Mason and Harrison, 1996a), Sweden (Landstrom, 1995) and Canada (Riding *et al.*, 1993). However, evidence of the impact of the informal market for risk

capital has been limited primarily to more highly developed regions and to areas with significant clusters of industrial and business activity (Aram, 1987; Haar, Starr and MacMillan, 1988; Neiswander, 1985; Tymes and Krasner, 1983).

In light of the problems of access to capital faced by small firms, especially at the start-up stage, governments in some countries, including Canada, have introduced a variety of financial measures over the years to help small businesses (Gracey, 2001; Riding and Haines, 2001). In Canada, the chartered banks represent the single largest source of credit to SMEs, while government is often seen as a lender of last resort. As a result, both groups are under increasing pressure to respond appropriately to the needs of SMEs, especially those considered to represent the best prospects for economic growth X knowledge-based firms.

Together, the banks and government agencies face the challenge of having to respond to the financial needs of knowledge-based industries without having the experience or know-how of their more traditional lending practices. There have thus been attempts to specialise, following assessments of the needs of KBBs. For example, the study *Financing the New Economy* (Industry Canada, 1994a) was undertaken in recognition of the critical importance of access to financing to the success of knowledge-based small firms. This report made specific recommendations to improve access to capital to export-oriented and knowledge-based businesses. A number of the chartered banks have responded by implementing specialized lending units with account managers trained to deal with applications from non-traditional sectors. These units have been established in a number of areas of major KBB concentration, but are problematic in a number of ways. First, they do not service peripheral locations, such as Newfoundland and Labrador. Second, little is still known about the extent to which

the risk assessment approaches used by the banks in general have been modified and how effective they have been in adequately assessing risk in knowledge-based firms.

As interest in knowledge-based sectors grows, there has been a corresponding increase in the need to provide specialist support of this kind for knowledge-based industries, though intervention on behalf of this group remains low in proportion to the total financial assistance provided to small firms. As a result, risk assessment practices by banks and government agencies are still relatively undeveloped for knowledge-based businesses.

The primary aims of the present study are to further our understanding of the financing requirements of knowledge-based SMEs and to examine the risk assessment approaches utilized by the banks and government agencies when assessing applications for financing from firms in knowledge-based industries, especially at the start-up stage. An understanding of the processes and related decision criteria should be useful to the development of a risk assessment model for use in delivering financial assistance programs to knowledge-based firms. Such a model could help to stimulate growth in the knowledge-based sector by permitting lenders and economic development agencies to increase their activity in this area and by assisting entrepreneurs to better anticipate and manage their financial requirements.

The remainder of this chapter elaborates on the elements underlying the aims of this research, briefly discusses previous research, provides details of the scope and purpose of the study, describes the research setting, and provides an outline of the thesis.

## 1.1 The Role of Small and Medium-Sized Firms in the Economy

Since the release of the seminal work of David Birch (1979 and 1981) in the United States, there has been increasing recognition of the role of small and medium-sized enterprises in the economies of most industrialized countries. In Canada, a 1990 report by Industry, Science and Technology Canada provides one of the earliest confirmations that businesses with annual revenues of less than \$5 million are major contributors to the economy, accounting for a significant portion of the sales (28%) and profits (27%) of all firms in Canada. The impact of SMEs on employment (42%) and job creation (81%) has been even more pronounced. More recent data (Arend *et al.*, 1997; Industry Canada, 1995b) indicate that, including the self-employed, more than 99 percent of all businesses in Canada are small businesses and these firms account for approximately 38 percent of the gross domestic product (GDP) of the country.

SMEs are similarly having a significant impact on the economies of Atlantic Canada<sup>2</sup> (Gorman and King, 1998). In terms of employment, the small business share has remained strong, despite considerable volatility in the region and in the country over the period from 1989 to 1995. The SME share of total employment in Canada increased from 54 percent in 1989 to 56 percent in 1995, while in Atlantic Canada the share remained steady at 51 percent over the same period (Atlantic Canada Opportunities Agency, 1998). The most recent data (Gorman and King, 1998) also confirm the growing importance of the micro-firm category (firms with fewer than five employees). Over the six-year period covered in this study, the percentage of all firms accounted for by the micro-firm category increased from

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<sup>2</sup> The most easterly region in Canada consisting of four provinces: Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland and Labrador.

74.5% to 78.7%. This category was the major contributor to growth in the number of firms, experiencing the largest increase in the number of firms and accounting for almost all of the increase in the number of firms in the region over the period. As in previous studies (ACOA, 1996), the Province of Newfoundland and Labrador continues to lead the Atlantic region in both business entry and exit rates<sup>1</sup>.

## 1.2 The Knowledge-Based Economy

Coincident with the growth in the small business sector and the recognition of its importance is the growing consensus among policy-makers and academics that most industrialized economies are increasingly becoming "knowledge-based" (Smith, 2000). According to the Organization for Economic Cooperation and Development (OECD), the term "knowledge-based economy" recognizes the important role of knowledge and technology in economic growth (OECD, 1996a). Knowledge, both as an input and an output, is increasingly seen as a key source of job creation, competitive advantage and long-term growth.

The report *Growing Small Businesses* (Industry Canada, 1994b) identified a number of characteristics of the emerging economy in Canada. Not surprisingly, knowledge intensity is one of these salient characteristics and is considered to be a significant competitive advantage for many of the companies that will succeed in this new economy. Recent evidence confirms the Canadian economy is becoming more knowledge-based and technology-intensive (Gera and Mang, 1997) and more skill intensive (Gera and Mass9, 1996). The authors analyze Canada's industrial structure

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<sup>1</sup> Entries are defined as businesses that enter a region's economy during the period, while exits are firms that have left the economy during the period. Entry rates and exit rates are calculated by dividing the number of new firms or exiting firms by the number of firms that existed at the beginning of the period.

4.

over the twenty-year period from 1971 to 1991 using a Statistics Canada input/output model that is based on the previous work of the OECD (1992). However, the Canadian study examines more closely the role played by the emerging industries of the new economy where innovation depends largely on knowledge, technology and skills. Findings from the two studies confirm that structural change has occurred in Canada and that the economy has moved up the knowledge intensity scale. There also has been a significant shift in employment away from the traditional sectors X primary, manufacturing and construction X to the service sector. However, despite the decline in manufacturing employment, the studies also highlight that four manufacturing industries X computers and office equipment, aircraft manufacturing, rubber and plastics, and pharmaceuticals X were in the top 10 fastest growing industries, reinforcing the fact that the use and production of knowledge is not limited to the service sector.

In combination, the two studies provide considerable evidence of a shift towards a knowledge-based economy and of the growing importance of knowledge-based industries. In all sectors, including manufacturing, services and resources, industries which require high-knowledge have outpaced those with more modest knowledge requirements. Further, employment in these high-knowledge industries appears far less susceptible to cyclical downturns.

### **1.3 Defining Knowledge-Based Businesses**

While there appears to be agreement on the need to address the problem of access to capital for these potentially high growth ventures, a major problem has emerged. Nobody really knows how to define “knowledge-based” industries (KBI) or

knowledge-based businesses, and there is a wide divergence of agreement among the various lending organisations (Harris, 2000). As pointed out by Howitt (1996; 10), "we have no generally accepted empirical measures of such key theoretical concepts as the stock of technical knowledge, human capital, the resource cost of knowledge acquisition, the rate of innovation or the rate of obsolescence of old knowledge."

In the absence of standard economic methods to measure knowledge, a number of definitions of KBIs have been put forward. Industry Canada focuses on the use of information or other advanced technology and scientific research to define knowledge-based sectors. On that basis, 20 industries, as defined in the Standard Industrial Classification (SIC) codes used by Statistics Canada, are considered to represent the knowledge-based sectors (Table 1.1).

**Table 1.1**  
**Knowledge-Based Industry Sectors<sup>4</sup>**

<b>SIC</b>	<b>Industry</b>
0239	Services incidental to agriculture not elsewhere classified
3211	Aircraft & aircraft parts manufacturing
3341	Record player, radio and television manufacturing
3351	Telecommunications and equipment industry
3352	Electronic parts and components industry
3358	Other communications and electronic equipment
3361	Electronic computing and peripheral equipment industry
3362	Electronic office, store and business machine industry
3381	Other electronic office, store and business equipment
3369	Communications and energy wire and cable manufacturing industry
3741	Pharmaceutical and medical industry
3911	Indicating, recording and controlling instruments
3912	Other instruments and related products
4814	Cable television
4812	Telecommunications carriers
4839	Other telecommunications
7721	Computer services
7759	Other scientific and technical services
9611	Motion picture and video recording
9619	Other motion picture, audio and video recording

<sup>4</sup> KBIs as defined by Industry Canada.

The federal government, using work by Lee and Has (1996), categorizes 55 SICs as high, medium or low knowledge-intensity (Table 1.2). Lee and Has utilize research and development and human capital indicators to measure knowledge-intensity and to define knowledge-intensive industries. A third definition, developed for the venture capital industry, defines KBIs as including the following: biotechnology and information technology, communications, electronics, energy and environmental technology and some industrial equipment, including advanced materials.

**Table 1.2**  
**Knowledge Intensity Groups**

<b>High-Knowledge</b>	<b>Medium-Knowledge</b>	<b>Low-Knowledge</b>
Scientific & professional equipment	Other transportation equipment	Fishing & trapping
Communication & other electronics	Other electrical & electronics	Wood
Aircraft & parts	Primary metals (non-ferrous)	Furniture & fixtures
Computer & related services	Textiles	Logging & forestry
Business machines	Communication	Transportation
Engineering & scientific services	Paper & allied products	Storage & warehousing
Pharmaceutical & medicine	Mining	Agriculture
Electrical power	Rubber	Retail trade
Machinery	Plastics	Personal services
Refined petroleum & coal products	Primary metals (ferrous)	Quarry, sand pits & mining
Management consulting services	Non-metallic mineral products	Accommodations
Educational services	Wholesale trade	Clothing
Health & social services	Crude petroleum & natural gas	Leather
Pipeline transportation	Fabricated metal products	
Other business services	Motor vehicles & parts	
	Food	
	Beverages	
	Tobacco	
	Finance, insurance & real estate	
	Other utilities	
	Services incidental to mining	
	Other services	
	Printing & publishing	
	Construction	
	Amusement & recreation	

The Canadian Bankers Association (CBA) has adopted the 20 SIC code classification for reporting data on lending to the knowledge-based sector and has been collecting separate statistics on the KBI market since the third quarter of 1996.

However, a recent study completed for the CBA by Thompson Lightstone and



Company Ltd. (1998) indicates that the SICs do not necessarily reflect the views of entrepreneurs. Self-identification by entrepreneurs in this study indicated that 68 percent felt their businesses were knowledge-based whereas only four percent were considered KBI under the Industry Canada definition.

The implication of the proliferation of definitions of KBBs and KBIs is that the banks and government agencies likely take different approaches to meeting the needs of these firms. In addition, the agendas and mandates of the various financial institutions differ. The resulting diversity is no doubt reflected in the lending practices and risk assessment approaches of these key organizations and is open to empirical investigation. It is far more interesting and important at this stage of research to assess how the various partners in the financing process perceive and use the term “knowledge-based” than it is to arrive at an objective definition of a KBB or a KBI.

The present study uses the classification developed by Lee and Has (1996) and input obtained from a survey of entrepreneurs to define knowledge-intensive industries. Details of the approach used to classify firms by level of knowledge-intensity are provided in Chapter 4.

#### **1.4 Small Firm Access to Capital**

Recognition of the role of small and medium-sized enterprises has precipitated a growing amount of research on small business and entrepreneurship. One area, in particular, that has received considerable attention from the academic, business and government communities, is the financing of SMEs. The reason for the interest in this area is that the continued creation and expansion of small businesses depends, in part, on their ability to secure appropriate financing. Many of the studies in this area have

identified problems encountered by SMEs in obtaining both debt (Small Business Working Committee, 1994) and equity financing (Canadian Chamber of Commerce, 1988). These problems reflect issues from both the demand-side (entrepreneurs) and the supply-side (lenders and investors) and often relate to agency and information asymmetry problems (Jensen and Meckling, 1976). In addition, the reluctance of small firm entrepreneurs to seek equity (Myers and Majluf, 1984) has placed added importance on the role of debt financing. Further, small firm financing decisions may be strongly influenced by managerial choice, which largely reflects the values and goals of the entrepreneurs (Barton and Matthews, 1989).

Recent research confirms that debt financing plays a major role in supporting Canada's SMEs with 90 percent using some form of debt compared to 74 percent using equity sources (Thompson, Lightstone and Company, 1998). Although the use of other debt sources is increasing, this study also indicates that banks or other financial institutions continue to be the key source of debt financing, utilized by 63 percent of SMEs. In Atlantic Canada, the chartered banks are even more important providers of SME debt financing accounting for 65 percent of total SME debt financing compared to 53 percent for Canada as a whole (Shutt and Vanasse, 1999).

Research also confirms that access to financing is more problematic for knowledge-based firms and that, as a result, SME growth and contribution to job creation is being constrained in this high potential sector of the economy (Industry Canada, 1994a). While the same proportion of knowledge-based SMEs use debt to finance their business as reported by SMEs in total, the median reported debt load from financial institutions is below the SME norm (Thompson, Lightstone and Company, 1998). Further, this same study confirms that the use of equity financing by knowledge-based SMEs is greater than for SMEs overall and that knowledge-based

SMEs are considerably less satisfied with their main financial institution than are SMEs in general.

Very often, lenders and investors indicate that the risks associated with knowledge-based ventures are too great. Not surprisingly, the small business operator has a much more positive view of the company's prospects and the level of risk attached to a financing request. Further, not only are there differences in perspectives between entrepreneurs and lenders, entrepreneurs generally lack the financial skills to relate to the process that lenders follow in evaluating an application for financing and do not understand how lenders price and manage loans (Wynant and Hatch, 1990).

Notwithstanding the differing perspectives of entrepreneurs and financiers, there is considerable agreement that risk evaluation is a critical task associated with the provision of financing to small and medium-sized firms. It is also clear that the emerging role of the knowledge-based firm and the gradual shift from physical to intellectual assets suggests that a more comprehensive approach to risk evaluation is required (Ibrahim, 1997a and 1997b). In a similar light, the Industry Canada (1994a) report, entitled *Financing the New Economy*, recommended that the chartered banks should continue efforts to establish technology centres to service knowledge-based small firms and should provide training to account managers on how to assess knowledge-based companies. While it appears that considerable progress has been made in these areas in the last three years (Groupe Secor Inc., 1998), it is not clear to what extent the risk assessment approaches used by the banks have been modified and how effective they have been in adequately assessing risk in knowledge-based firms. Further, there is limited information on the process used by government funding agencies when reviewing applications for financing from firms in this critical growth sector of the new economy.

## **1.5 Traditional Lending Approach**

The literature on bank lending reveals that financial institutions are low-risk lenders. The banks acknowledge this fact. Canadian chartered banks target loan losses of 0.5 percent to 1.0 percent of their total loan portfolio. In addition, the banks are quick to point out the difficulties of servicing the SME sector, citing low-margins and high turnover rates of small business.

The federal and provincial governments provide a variety of financial support programs targeted to Canadian SMEs. In most instances, the focus of that support has shifted in the last five years from providing subsidies and grants to providing low interest loans and loan guarantees. As a result, the majority of government financial support closely resembles traditional lending.

Credit decision-making includes two main components: risk assessment and loan structuring. Risk assessment refers to the process of evaluating the risks associated with a loan request. Loan structuring refers to the determination of the terms and features attached to the loan. Risk assessment is operationalized through the application of credit parameters generally referred to as the "Cs" of credit. The number of factors varies; however, the traditional approach (Hays, 1977) includes the following parameters: capacity, capital, collateral, character and conditions or circumstances. Capacity represents the extent to which the organization is able to meet its obligations and is usually reflected in the cash flows of the business. Capital refers to the equity of the business, or the investment of the entrepreneur, and provides a measure of the firm's ability to weather setbacks. Collateral refers to the assets (business and personal) that are available as security in the event of default. Character refers to the intent and commitment of the entrepreneur to repay the loan and includes her/his track record.

Bankers sometimes refer to "character" as the borrower's honesty, integrity and willingness to deal with the bank in a reasonable fashion (Wynant and Hatch, 1991). Conditions or circumstances is a catchall for a number of internal and environmental factors that may affect the borrower's ability to repay, including, but not limited to, the following: the proprietary nature of the product, competition, size of market, and industry climate and trends.

There appear to be diverging views on the relative importance of these parameters. Bank critics suggest that the banks overemphasize collateral. There is some empirical evidence to indicate that character and capacity are the factors of primary importance to the banks (Petty and Upton, 1997; Fabowale *et al.*, 1991; Wynant and Hatch, 1991). There is little consensus of opinion from entrepreneurs, although their perceptions appear consistent with the views of the critics (Petty and Upton, 1997). Determining the relative importance of these factors is further complicated by the fact that there are clearly multivariate associates among the five variables (Riding and Swift, 1993). Each of these factors encompasses a myriad of measures including objective information and criteria, and subjective and qualitative impressions.

The second component of credit decision-making is loan structuring. Decisions related to the structure of the loan include the amount of financing, the pricing of the loan, the repayment terms, the collateral required, and the conditions imposed on the business. The latter specifies the type and timing of information that the business must provide to enable the lender to monitor the loan. It also includes any restrictive covenants that the lender employs to adjust for the risk in small business lending (Apilado and Millington, 1992). Bankers indicate that these terms are not set independently but jointly, so as to achieve the appropriate risk/return profile (Wynant

and Hatch, 1991). Further, some bankers indicate that loan structuring can be used to turn an otherwise unacceptable loan into an acceptable one.

The evaluation and structuring of loans to SMEs are complex and often judgmental tasks. Credit decision-making by account managers does not occur in isolation. The banks' philosophies and commitment to SMEs provide an overall framework within which account managers interact with, and provide service to, entrepreneurs. The lending decision is also a process of interaction between the account managers' experiences and the banks' rules and guidelines (Fletcher, 1995a). As such, lending decisions reflect credit decision-making processes, bank policies and account managers' intuition and judgement.

## **1.6 Previous Research**

Although there has been a considerable research effort directed to the small firm sector, research focused on knowledge-based SMEs is extremely limited. Similarly, while much attention has been devoted to various aspects of small firm financing, there is a general paucity of research which examines the risk assessment processes and decision criteria employed by lending institutions, particularly with respect to the knowledge-based sector. Nonetheless, there is a body of literature that provides a theoretical framework and some empirical findings that are useful to the present study.

As noted previously, asymmetric information is a fundamental issue underlying financing relationships (Stiglitz and Weiss, 1981). Petit and Singer (1985) discuss the problems of asymmetric information and agency costs and their impact on the availability and cost of debt for small firms. Essentially, the entrepreneur (agent) is the primary source of information in the small firm. In addition, the entrepreneur has

Provinces. The province consists on an island portion (Newfoundland) and Labrador, which adjoins the Province of Quebec. There are more than 700 communities in the province, scattered along some 17,000 kilometres of coastline. The provincial population is relatively small with slightly more than 550,000 residents (1996 census), 2.9 percent fewer than the 1991 census figure. Approximately 32 percent of the population live in the St. John's Census Metropolitan Area (CMA), which includes the two largest cities in the province, St. John's and Mount Pearl. Outmigration, especially of the younger and more educated, has been a significant problem for the province. Almost 80 percent of those who left the province in the five-year period ending in 1996 were under the age of 35, and 65 percent had some post-secondary training. The average annual unemployment rate in Newfoundland and Labrador is the highest in the country and has been for some years, falling consistently in the 17 to 20 percent range.

Traditionally, the economy of Newfoundland and Labrador has been based almost exclusively on the fishing industry and particularly on the harvesting of the North Atlantic codfish. In 1991, in recognition of significantly depleted cod stocks, a moratorium was placed on the fishing of Atlantic cod. Subsequent moratoria were extended to other major groundfish stocks. As a result, the traditional fishing economy has all but disappeared. However, significant restructuring and diversification into higher value shellfish, such as shrimp and crab, have resulted in an industry that presently has a higher landed value for all fish species than at any previous time in the province's history.

In light of the problems experienced as a result of overreliance on a single industry, the province has been actively pursuing a strategy of diversification for a number of years. The province's strategic economic plan is outlined in the document, *Change and Challenge* (Government of Newfoundland and Labrador, 1992) and is

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based on the premise that technological changes, especially in telecommunications, and the opening up of new markets in the global economy, have created new economic opportunities in sectors such as, information technology, health, and adventure tourism. Today, the economy of the province is most aptly described as a diversified resource-based economy with significant wealth generation and employment in a number of sectors, including the following: fisheries and aquaculture; mining; forestry; hydroelectricity; oil and gas; manufacturing; construction; tourism; agriculture and secondary food processing; technical and information industries; and a host of public, professional and business services.

Recent research by the Atlantic Provinces Economic Council (APEC) indicates the knowledge-based sector is making a significant contribution to economy of Newfoundland and Labrador (APEC, 1997). Estimates by APEC indicate high knowledge-intensive firms account for 14 percent of business sector gross domestic product (GDP) while the medium knowledge-intensity group accounts for an additional 61 percent. In terms of employment, the percentages are 11 and 35 percent respectively. Further, over the period from 1983 to 1995, high-knowledge firms accounted for 47 percent of the new jobs.

As indicated previously, the entrepreneurial spirit is alive and well in Newfoundland and Labrador. The province consistently leads the Atlantic region in the rate of business start-ups (ACOA, 1994; ACOA; 1996; ACOA; 1998). The most recent data indicate an average entry rate in excess of 24 percent for the six-year period ending in 1995. This compares to a rate of 19.4 percent for the Atlantic region and 14.9 for the country. However, over the same period, Newfoundland and Labrador also had the highest average exit rate at 23.5 percent compared to 18.6 for the region and 14.5 for the country. The province also exhibited the highest rate of growth in self-



employment over the period, an increase of 22.8 percent compared to 15.8 percent for Atlantic Canada and 19.4 percent for Canada.

There are a number of financial institutions and government departments and agencies in the province that provide financial assistance to SMEs. The present study focuses on the following organizations: chartered banks, including Bank of Montreal (BMO), Canadian Imperial Bank of Commerce (CIBC), HSBC Bank Canada (HSBC), Royal Bank of Canada (RBC), Scotiabank (SB) and Toronto Dominion Bank (TD); the Atlantic Canada Opportunities Agency (ACOA); the Business Development Bank of Canada (BDC); the Department of Development and Rural Renewal (DDRR); and the Department of Industry, Trade and Technology (DITT)<sup>5</sup>. A brief overview of each organization follows.

As indicated previously, the chartered banks are the major source of debt financing for SMEs in Canada and the situation is no different in Newfoundland and Labrador. Although all banks, with the exception of HSBC, have established specialized lending centres to deal specifically with knowledge-based SMEs, none of these centres are located in the province. In the vast majority of cases, commercial credit applications are handled by local account managers, who draw upon the specialized expertise of lenders located outside the province as required.

The Atlantic Canada Opportunities Agency (ACOA) is one of four regional economic development agencies and initiatives established by the federal government to support local economic development. These organizations work closely with other SME stakeholders, including the private sector, to provide access to capital, information and skills development. Although involved in a number of federal/provincial initiatives, ACOA's Business Development Program (BDP) is

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<sup>5</sup> A merger between the DDRR and the DITT was announced on February 13, 2001. The new department is known as Industry, Trade and Rural Development.

targeted specifically to small and medium-sized enterprises. The BDP offers interest free, unsecured loans that can be used for a variety of purposes, including start-up, expansion and modernization, research and development, training, productivity and quality improvements, marketing and trade development and consulting advice. The maximum level of assistance is 50 percent for capital costs, including working capital to support start-ups, expansions and modernizations, and 75 percent for operating costs such as training, marketing, consulting and quality assurance.

The Business Development Bank of Canada (BDC) is a Crown corporation that offers financial, counselling, mentoring and management training services through a network of more than 80 branches across Canada. The BDC is not a bank; it does not accept deposits but it does provide commercial loans and innovative financial products specifically designed to meet the needs of small and medium-sized enterprises. Thus, the BDC plays a complementary rather than a competitive role with the chartered banks and other private sector financial institutions. For example, the BDC plays a significant role in reducing the uncertainty and high risk, perceived by the banks and investors in general, of lending to knowledge-based small businesses, by offering term loans to top-up existing working capital loans. In addition, the BDC has formed a number of strategic alliances with other financial institutions<sup>6</sup> and economic development agencies to deliver innovative financial services to targeted sectors of the economy, such as knowledge-based businesses, tourism businesses, aboriginal-owned businesses and youth ventures. Financial services range from working capital loans to term loans to venture capital financing. Specific financial products reflect the mandate of meeting the needs of a diverse group of SMEs from micro businesses to high-growth,

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<sup>6</sup> For example, the Business Development Bank of Canada has an agreement with Toronto Dominion Bank to offer joint loan packages to innovative manufacturing, knowledge-based and export oriented businesses.

technology-intensive and export-oriented firms.

The Department of Development and Rural Renewal (DDRR) is the lead provincial agency for small business development. The Strategic Enterprise Development Program of the Department provides financial assistance in the form of term loans and equity participation to seed new business start-ups in strategic sectors, especially firms to be located in rural areas of the Province. The focus is on firms that are either export-oriented or clearly demonstrate significant import replacement potential. Funding is intended to lever financing from other government and non-government sources.

The Department of Industry, Trade and Technology administers the Economic Diversification and Growth Enterprises Program (EDGE) which offers generous tax incentives to encourage new or expanding businesses to locate in the Province. Under the EDGE program, companies making a minimum capital investment of \$300,000 or producing incremental sales of \$500,000 and creating ten new local jobs may qualify for a ten-year tax holiday from provincial corporate income tax, health and post-secondary education tax and retail sales tax. The program also includes a further five-year period over which these taxes are phased in at the rate of 20 percent of the basic rate annually.

In summary, the province of Newfoundland and Labrador represents an ideal setting to explore lending to knowledge-based businesses. SMEs generally and KBBs specifically have made important contributions to the economy of the Province and offer significant potential for future growth. At the same time, access to equity sources at both the formal and informal levels has been extremely limited. As a result, the chartered banks and government agencies play important roles in the provision of much

needed finance to the KBB sector. All major Canadian chartered banks have a commercial lending presence in the Province, as does HSBC Bank Canada, one of the most active foreign banks in the Canadian marketplace. Similarly, government initiatives have been undertaken at both the federal and provincial levels to support the start-up and expansion of small firms. To date, little is known about the risk assessment practices of chartered banks and government agencies, and the extent to which they reflect the needs of knowledge-based businesses. The organizations in this Province have committed support to the proposed study, offering a rare opportunity to investigate approaches to institutional lending.

## **1.9 Outline of the Thesis**

This thesis contains seven chapters including this introductory chapter. Chapter two reviews the literature. Chapter three presents the research framework and research questions. Chapter four discusses the research methodology and the methods of data collection and analysis. Chapter five presents and discusses demand-side findings from a survey of entrepreneurs. Chapter six presents and discusses supply-side findings from interviews and business plan experiments conducted with individuals in lending institutions. Finally, after summarizing the results, chapter seven discusses the implications for theory development, management practice and policy making, as well as limitations and recommendations for future research.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

Although the present study is exploratory in nature, it draws upon literature from several related cognate areas, including theoretical and empirical research on capital structure, credit rationing, commercial lending, venture capital and intellectual capital.

#### **2.1 Capital Structure**

Theories of capital structure provide the point of departure for the study of lending to knowledge-based firms, as they encompass both demand-side and supply-side perspectives concerning the use of debt and equity for an optimal delineation between the two. Van der Wijst (1989), through an extensive literature review, identifies the following four theoretical determinants of financial structure: taxes, bankruptcy costs, agency costs and signalling effects. The impact of taxation and debt on the cost of capital and the market value of the firm is discussed in the seminal articles by Modigliani and Miller (1958 and 1963). Modigliani and Miller (1958) initially argue that the cost of capital and the market value of the firm are unaffected by the amount of debt in the capital structure assuming perfect capital markets and no taxes. In a subsequent correction paper (1963) they argue in support of more traditional financial theory (Solomon, 1963) which is based on the balancing of the tax savings

arising from the use of debt with the associated leverage or bankruptcy costs when allowing for corporate taxation.

The static trade-off hypothesis (Myers, 1984) is a more recent statement of the taxation and leverage approach and suggests that firms will minimize their financing costs and thus maximize firm value by increasing their use of debt until the present value of the tax savings from the interest deduction equals the present value of the expected costs associated with financial distress. Numerous studies have been undertaken that support and criticize Modigliani and Miller's initial arguments on the irrelevance of debt, including Robichek and Myers (1966), Stiglitz (1969), Kraus and Litzenberger (1973), and Fama (1978). Miller (1977) also argued that disadvantages associated with personal taxation may offset the corporate tax advantage of using debt, an issue that may have significant implications for small closely-held firms.

In addition to theories of capital structure based on the tax savings and bankruptcy costs associated with the use of debt, a second area, that of agency costs, has generated considerable attention in the literature,. The concept of agency costs, as developed in the seminal article by Jensen and Meckling (1976), is based on principal-agent relationships wherein the firm's creditors and shareholders (principals) incur costs in order to monitor the actions of management (agent). Agency costs result from information asymmetry or unevenly balanced information (Akerlof, 1970).

Information asymmetry underlies much of the study of agency costs, signalling and adverse selection. In the case of debt financing, borrowers possess "inside" information that is not available to lenders (Leland and Pyle, 1977). These agency or monitoring costs increase the cost of capital to the firm since the principals will reduce the amount that they are willing to pay for a firm's securities by an amount equal to the agency costs that they expect to incur. As a result of these agency costs, Jensen and Meckling

(1976) suggest that an optimal capital structure may exist even in the absence of taxes and bankruptcy costs.

Jensen and Meckling identify three factors that influence the agency costs of debt: incentive effects; monitoring and bonding costs; and bankruptcy and reorganization costs. Incentive effects refer to the negative impact of the use of debt on the investment behaviour of the owner-manager. Essentially borrowers are encouraged to invest in riskier projects resulting in opportunity wealth loss. Similarly, the use of debt is influenced by the monitoring costs incurred by creditors and the bonding costs incurred by the owner-manager. Finally, the existence of bankruptcy and reorganization costs help to explain why a firm's capital structure is not comprised entirely of debt.

Related to agency cost theory is the concept of signalling. Ross (1977) suggests, among other things, that the financing decisions taken by management are signals of the firm's future performance. Decisions by management to issue equity send negative signals to investors about the firm's future ability to finance projects internally and to service new debt while decisions to issue debt send positive signals. Signalling is the direct result of information asymmetry wherein management possesses information not available to investors or potential investors. As with monitoring costs, the costs to generate the information required to reduce asymmetry may be high.

Modern financial theory rests on assumptions of efficient capital markets. Markets are assumed to be frictionless and competitive. Buyers and sellers of capital have access to complete information about sources of funds and investment opportunities. Such is hardly the reality of the small firm environment (Van Auken, 2001). Consequently, a number of theoretical and empirical studies have been

undertaken with a view to explaining the financing decision in the context of the small firm.

Stanger (1992) and others (Pettit and Singer, 1985; Ou, 1988) argue for the importance of an agency perspective in explaining financial theory in small firms, suggesting that small firms differ from large ones in two important respects: less separation of ownership and management, and more closely-held ownership in smaller firms. Closely associated with these differences is the potential for small firms to more easily change their asset structure (flexibility) and for greater inside information (asymmetry). Stanger argues that these differences have a significant impact on the application of modern financial theory to the small firm context. He discusses standard financial constructs in four areas: financial objectives; investment decisions; financing decisions; and distribution decisions. Two of these, the financial objective of the firm and the financing decision, are of particular relevance here.

Financial theory assumes that the objective of the firm is to maximize shareholder wealth. In the small firm, the owner's risk and lifestyle preferences, as well as the desire to maintain control place significant constraints on the ability to maximize the value of the firm and shareholder wealth. Similarly, the owner/manager's objectives can have a significant influence on small firm financing decisions. Barton and Matthews (1987 and 1988) argue that a strategy perspective might be much more useful than the traditional finance paradigm in explaining capital structure choice at the firm level. In highlighting the shortcomings of traditional financial theory in explaining capital structure, the authors suggest that such decisions are strongly influenced by managerial choice. In their view (Barton and Matthews, 1989) managerial choice, which includes values and goals, may be an even more important



determinant of capital structure in small firms and should be incorporated into a strategic decision framework to fully understand financing decisions.

Ou (1988) echoes the views of Stanger and Barton and Matthews in arguing for the integration of agency theory, information asymmetry and owner's objective function to examine the impact of factors affecting lenders' and borrowers' financing decisions. In terms of agency theory, the entrepreneur who borrows money enters into a contract with the lender whereby the firm becomes an agent of the lender or principal. To reduce the problem of moral hazard (Arrow, 1963), lenders take a number of steps to ensure that the entrepreneur acts in their best interests, including monitoring the actions of the entrepreneur and placing restrictions on the entrepreneur's freedom to act. The former results in the lender incurring monitoring costs while the latter results in direct and indirect costs to the borrower. Direct costs consist of bonding costs to protect the lenders against potential loss while indirect costs include restrictions on the use of assets or the ability of the entrepreneur to obtain additional financing. Both types of restrictions limit the independence of the entrepreneur. Further, lenders often require a personal guarantee as a way of mitigating the potential risk of the borrower misusing the assets of the business, thereby creating residual loss<sup>1</sup> and reducing firm value.

To make a decision whether or not to enter into the contract, the lender requires certain information to evaluate the proposal and the firm's ability to repay, and to determine if the borrower is likely to act in the best interests of the lender. Such information may not be equally available to both parties. Information asymmetry results not only in monitoring costs, related to the problem of moral hazard outlined previously, but also in additional costs to reduce the likelihood of adverse selection

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<sup>1</sup> Residual loss is defined as "... a reduction in the principal's welfare due to a divergence between the decisions that agents take, and the decisions which would maximize the welfare of the principal" (Stanger, 1992; 5).

(Binks *et al.*, 1992). Adverse selection (Akerlof, 1970) refers to the errors that may result when lenders provide external financing. Two types of errors may arise: entering into a contract that turns out to be a failure and not entering into a contract that subsequently proves to be successful, i.e. Type I and Type II error.

According to Ou (1988) information asymmetry problems may be even more pronounced for small, young firms operating in dynamic sectors. The proprietary nature of products and processes is such that entrepreneurs are very reluctant to disclose information that may fall into the hands of competitors. As a result, lenders face the choice of acquiring more information in order to evaluate the business opportunity or of relying on collateral security as a substitute for more information. The former increases the indirect costs of borrowing while the latter may result in constraints on the firm's ability to access financing.

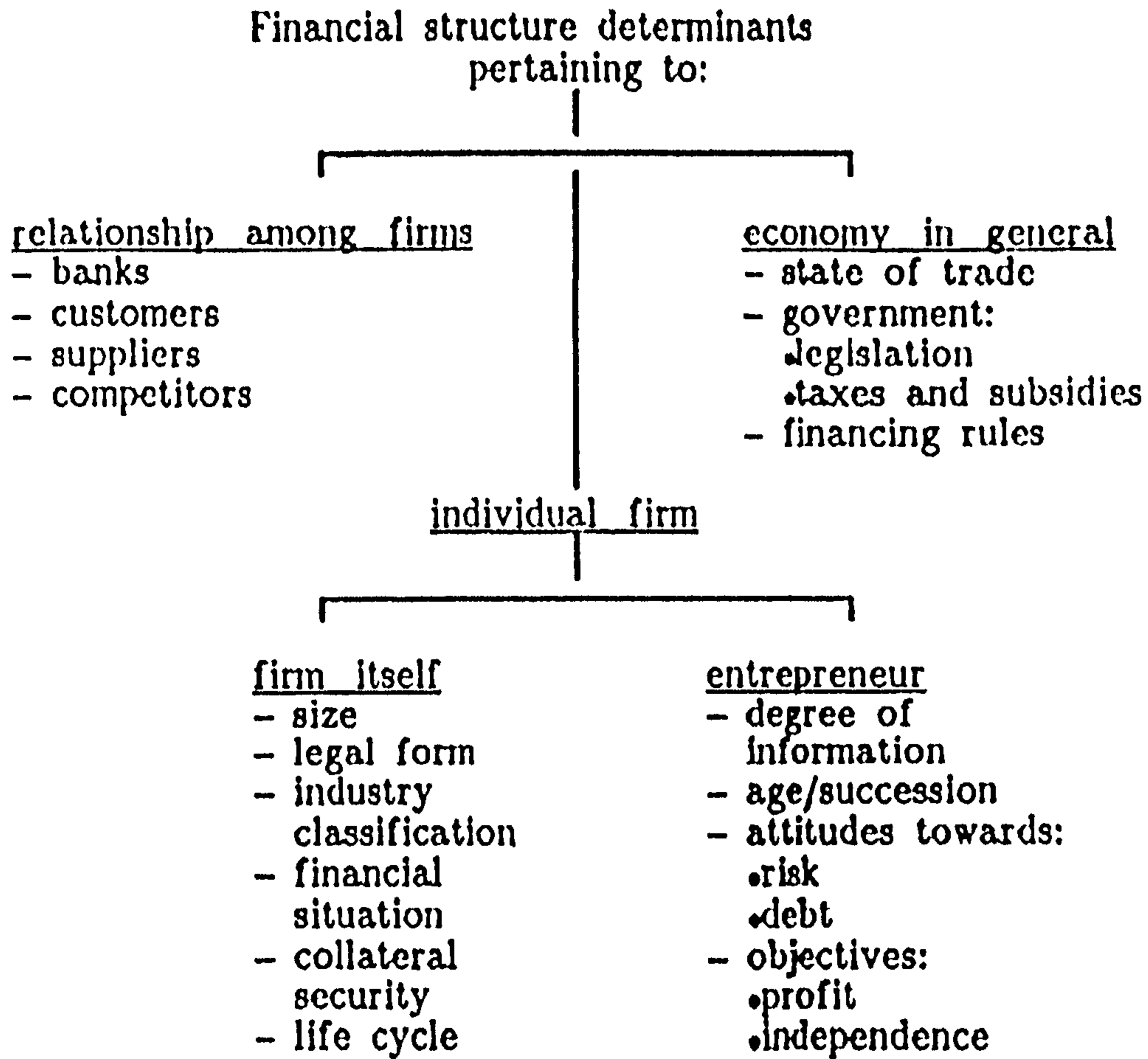
Ang *et al.* (2000) investigate equity-related agency costs in small firms under different ownership and management structures and conclude, among other things, that external monitoring by banks may result in lower agency costs to shareholders.

Ou also reiterates the importance of the owner's objective function by raising the issues of the growth and career aspirations of entrepreneurs. Objectives, such as personal independence and job satisfaction, often conflict with wealth accumulation. For example, the entrepreneur who is preoccupied with maintaining control is less likely to raise funds by selling equity and more likely to rely on debt financing. The result is that the capital structure of the small firm very often reflects the objectives and choices of the owner/entrepreneur rather than traditional financial theory.

Utilizing a framework developed by Sprenger *et al.* (1982), van der Wijst (1989) presents an overview of financial structure determinants extracted from the empirical literature (Figure 2.1).

Figure 2.1

Financial Structure Determinants



Source: van der Wijst, 1989

Of particular note, in the area of the firm's internal environment, is the concept of the life cycle of the firm (Churchill and Lewis, 1983). A comprehensive 12-country study by Peterson and Shulman (1987) provides support for the concept of a life cycle of capital structure. The authors demonstrate that, as a result of declining agency and information costs and the increasing availability of financing sources, small firms evolve into a lower cost capital structure. Institutional sources and costs are influenced by industry type, growth, timing of payments, and organizational type and maturity.

This study also provides evidence of the influence of the external environment and in particular, the stage of economic development of the host country. Results from this preliminary work on life cycle hypothesis indicate that a blend of agency cost, information asymmetry, static trade-off and pecking order theories are important in determining capital structure in small firms.

Norton (1991), in examining small high growth firms at the post-IPO (initial public offering) stage, argues strongly for the need to incorporate management theory into research on capital structure decisions in small firms. Results from Norton's study indicate that a pecking order theory plays a much more important role in explaining capital structure decisions in small public firms than do bankruptcy costs, agency costs or information asymmetries. Essentially, pecking order theory suggests that entrepreneurs prefer internal sources of funds to external sources and prefer external debt to equity. Although he excluded managerial theories, Myers (1984) had previously argued for the role of pecking order theory in explaining financing choices.

Van der Wijst (1989) also emphasizes the importance of information costs to small and young firms in a dynamic industry, since much of their expertise and knowledge is intangible and difficult to quantify. In a study of the investment activities of small business investment corporations (SBICs), which are private venture capital firms licensed and regulated by the U.S. Small Business Administration, Brewer *et al.* (1996) find significant support for the role of contracting (agency) theory in explaining investment decisions in small firms. Since SBICs provide both debt and equity financing, this study provides a unique opportunity to explore capital structure decisions. Characteristics of the firm that are correlated with agency conflicts are investigated to determine their impact on the use of debt or equity. Characteristics of SBICs are also examined. Results indicate that debt is more likely to be used to finance

projects that generate tangible assets and that allow little management discretion. Further, smaller firms are more likely to obtain debt than equity and the likelihood increases with the age of the firm. Finally, and perhaps most significant for the present research, firms whose value depends on growth opportunities or information, such as research and development, are less likely to receive debt financing. Conflicting results also indicate that firms in industries with more intangible assets are more likely to receive debt. The authors are unable to fully explain the apparent conflict in these two findings, suggesting that financing decisions may be more closely tied to the asset being funded in a particular transaction rather than to the total assets of the firm.

Although not exhaustive, these studies serve to illustrate the diversity and complexity of financing decisions in the small business environment and the fragmented nature of this literature. They also demonstrate that, as in the large firm efficient market context, the explanation of how firms choose their capital structures remains, in Myers (1984) words, "the capital structure puzzle." Nonetheless, these studies provide a useful framework for examining financing decisions from both a demand and supply-side perspective.

## **2.2 Credit Rationing**

A considerable body of literature dealing with credit rationing has developed over the last forty years. Credit rationing is explained as follows. The law of supply and demand suggests that if the demand for loans exceeds the supply, the interest rate will rise thereby reducing demand and establishing equilibrium. In effect, interest rates act to clear the market and restore equilibrium. However, banks do not always increase rates, choosing instead to ration credit or provide less than is demanded by customers.

Early theoretical explanations of credit rationing can be traced back to the so-called Availability Doctrine (Rosa, 1951). Rosa argued that monetary policy could affect the availability of credit through its effect on lenders. Rosa's arguments led to considerable interest in credit rationing. Subsequent authors (Kareken, 1957; Hodgman, 1960) offered theoretical explanations that were primarily institutional and descriptive in nature and based largely on imperfections in the commercial loan market. None of the early models of credit rationing included consideration of the demand for loans and loan rates were assumed to be given exogenously. The assumption was that credit availability was determined by the reaction of lenders to changes in yields on government securities. As a result, these theories did little to explain the composition of bank loan portfolios or lending decisions.

Jaffe (1967 and 1971) was one of the first to incorporate a demand-side perspective into the theory of credit rationing, arguing that information on loan supply by itself could not explain the existence of credit rationing. In an attempt to explain credit rationing by banks on a non-price basis, Jaffe and Modigliani (1969) developed a model "... in which the bank must offer a uniform interest rate to different borrowers, though that rate may be chosen freely and the loan size may be varied across customers" (Illier and Ibrahim, 1993; 274). This assumption is clearly inconsistent with the reality of loan markets and limits the explanatory power of their model.

More recently, explanations of credit rationing have been drawn from research relating to information asymmetry, adverse selection and moral hazard, as discussed in the previous section. Jaffe and Russell (1976) were the first to explore the role of information asymmetry in credit rationing. They developed a model of credit rationing based on imperfect information and uncertainty where borrowers have more information (asymmetry) about the likelihood of default than lenders and credit

rationing arises in response to the problem of adverse selection. However, as the authors point out, the model does not account for institutional arrangements, such as collateral requirements, down payment requirements or other non-price terms. In short, the actual market for loans is quite different from the market depicted in the model.

Stiglitz and Weiss (1981) also examined credit rationing under conditions of imperfect information. They argued that their work provided the first theoretical justification of true credit rationing. In their view, previous studies attempted to explain the relationship between interest rates and loan amounts exclusively on the basis of probability of default and adverse selection. Stiglitz and Weiss (1981; 394) "... reserve the term credit rationing for circumstances in which either (a) among loan applicants who appear to be identical some receive a loan and others do not, and the rejected applicants would not receive a loan even if they offered to pay a higher rate; or (b) there are identifiable groups of individuals in the population who, with a given supply of credit, are unable to obtain loans at any interest rate, even though with a larger supply of credit, they would." The authors argued the interest rate charged by the bank affects the risk of a loan in two ways: the interest rate acts as a screening device and the interest rate affects the behaviour of the borrower. On the one hand, an increase in interest rates discourages safer investors (adverse selection effect) while on the other hand, borrowers are encouraged to invest in riskier projects (incentive effect). As a result of these negative adverse selection and incentive effects, banks ration credit rather than raise interest rates. De Meza and Webb (1987) presented a conflicting theory of overinvestment rather than credit rationing resulting from a change in the assumption regarding returns. Stiglitz and Weiss assumed that all projects have the same expected return, whereas de Meza and Webb assumed that projects differ in expected returns.

The use of collateral also has been posited as an alternative approach to credit rationing. Collateral in loan contracts can be of two types. The first involves pledging assets of the borrowing firm as security in the event of default. The second type involves the borrower pledging additional assets that would not normally be available to lenders, such as personal assets of the entrepreneur. It is the latter type that has been the focus of the literature on the role of collateral. Stiglitz and Weiss (1981) view collateral as a disincentive for the borrower to default and consider collateral in the same light as interest rates. Therefore, increasing collateral requirements has the same potential negative effects as increasing interest rates. However, they studied the effects of interest rates and collateral requirements separately. Bester (1987) allowed banks to simultaneously adjust interest rates and collateral requirements. He also ignored the impact of collateral on repayment and focused on its role as a sorting and incentive mechanism to address the problems of adverse selection and moral hazard. He demonstrated that collateral can be used effectively to sort borrowers of different risk and to encourage investment in safer projects. As a result, he concluded that sufficient collateral mitigated the need for lenders to ration credit.

Chan and Kanatas (1985) also examined the role of collateral. Their perspective was the use of collateral under conditions of asymmetric valuations. In their view, collateral serves to remedy two types of asymmetries. The first is the case where lenders and borrowers have the same information but differ in their opinions about the value of projects. The second reflects the more traditional information asymmetry situation where differences in assessments and valuations are based on informational differences. A key assumption in their model is the absence of moral hazard. Chan and Kanatas (1985) argued that collateral could address the problem of differences of opinion as well as information asymmetry. In the case of different



opinions on valuations, collateral can serve as the observable variable on which the two parties can base a loan agreement. In the case of information asymmetry, collateral acts as a signal (Leland and Pyle, 1977) to lenders of the borrower's assessment of the project's quality. The transaction costs associated with providing collateral result in high quality borrowers offering more collateral. This argument differs from the traditional incentive role of collateral associated with the problem of moral hazard which suggests that low quality borrowers provide more collateral. The latter situation explains the use of collateral to address the problem of risk-averse lenders whereas, the use of collateral in the Chan and Kanatas model addresses uncertainties associated with valuation problems.

A more recent discussion of moral hazard by Williamson (1986) focuses on the aspect of costly state verification (Townsend, 1979). In this situation, lenders know as much as borrowers about the riskiness of projects, but only borrowers are able to observe project returns costlessly. Moral hazard results from the potential for borrowers to declare returns that are so low they lead to bankruptcy. Banks are forced to respond by incurring costly monitoring.

In a subsequent paper on moral hazard and private information, Chan and Thakor (1987) examine the importance of assumptions concerning competitive equilibria in previous studies dealing with credit rationing. The authors point out that the concept of competitive equilibrium influences credit allocations. In the Jaffe and Russell (1976) model all rents accrue to borrowers, whereas in the Stiglitz and Weiss (1981) model all rents accrue to depositors. Chan and Thakor (1987) demonstrate that in the former case, credit rationing does not result even if information asymmetry and moral hazard exist, as long as there is unlimited collateral. A critical underlying assumption is that lenders and borrowers agree on the value of the collateral, which as

indicated by Barro (1976) is not necessarily so. In the latter case, rationing may result under conditions of moral hazard and information asymmetry and as indicated in previous research (Chan and Kanatas, 1985) high-quality borrowers may offer more collateral. The authors acknowledge a significant limitation associated with the static nature of their model. As with previous models, this one does not capture the value of ongoing relationships between lenders and borrowers, that would likely affect incentives and moral hazard.

Building on work in the area of adverse selection and moral hazard, Diamond (1989) in a seminal study explored the relationship between reputation formation and incentive effects. Borrowers with no track record represent a significant adverse selection problem, one that is difficult to mitigate with reputation effects and that likely results in paying higher interest rates. These borrowers also face more severe incentive problems that result in choosing more risky and less valuable projects. Over time, acquired reputation serves to reduce the conflict of interest between lenders and borrowers and to reduce the problem of adverse selection. Reputation can have an immediate impact only in cases where adverse selection is minimal. One of the most significant implications of Diamond's model is that firms with short credit histories use bank borrowing and the associated influence on investment decisions to acquire their reputation. Further, Diamond is one of very few to consider bank-borrower relationships that extend beyond a single period.

An additional aspect of moral hazard, examined in the work of Igawa and Kanatas (1990), involves the borrower's use of pledged assets. The authors suggest that while the use of collateral can effectively sort credit applicants and deal with the issue of adverse selection, it can also result in undesirable incentive effects. The potential for the lender to acquire assets of the borrower creates an incentive for the borrower to

"misuse" pledged assets, thereby reducing their value. Moral hazard results from the inability of the lender to observe the "care" exercised by the borrower in the use of the pledged assets. Interestingly, the authors do not appear to distinguish between business and personal assets as discussed previously.

In summary, models of credit rationing, based on asymmetric information, assume that changes in interest rates have potential adverse effects on the quality of loans either through incentive effects or expected monitoring costs. As a result, banks control the quality of their loan portfolio by rationing credit rather than increasing rates. In cases where the bank can use alternate means to control loan quality, such as collateral requirements, credit rationing is unnecessary.

The literature on credit rationing is highly theoretical. Few attempts have been made at a direct assessment of the empirical significance of credit rationing. The differing assumptions underlying the various models have diverging implications for theory and practice and limit their usefulness. For example, as Illier and Ibrahim (1993) point out, the models typically assume that rationing takes the form of denying loans at any interest rate. It would be useful to examine the situation where loans are approved at amounts less than demanded. Similarly, the models assume that borrowers know more about the riskiness and outcomes of their projects than do lenders. This assumption is unlikely to hold in the case of many small and new firms, nor is it consistent with the specialized lending expertise and risk assessment processes of the chartered banks. Nonetheless, the various models of credit rationing offer insights into the significance of asymmetric information and the associated problems of adverse selection, moral hazard and monitoring costs in the credit market. Interestingly, one of the assumptions underlying credit rationing, that financial intermediation takes place

exclusively through the use of a standard debt contract, may be consistent with much of the small firm sector of the economy.

### **2.3 Commercial Lending**

The previous discussions of information asymmetry and agency costs provide a partial framework within which to examine the literature on risk assessment processes and decision criteria employed in commercial lending. Studies that develop and explore these aspects of the relationships between lenders and entrepreneurs are considered in some detail in this section of the literature review. However, credit rationing and finance gaps generally, might also result from fundamental uncertainty and from lending models that are limited by bounded rationality and influenced by cognitive dissonance (Philpott, 1995). Further, there is some evidence in the literature to suggest that risk assessment and lending decisions are influenced by environmental (Leblebici and Salanik, 1981) and organizational factors (McNamara and Bromiley, 1997) and by lenders' intuition (Jankowicz and Hisrich, 1987). The majority of these studies are empirical and a substantial portion is related to small firms. However, as indicated by Mattson (1993), very few studies of bank decision-making have been made public. As a result, the empirical base is quite limited. As a first stage in the review of the literature on commercial lending, it is useful to discuss a framework for credit decision-making and to examine the results of a number of comprehensive studies of bank lending in Canada.

Hatch and Wynant (1986) propose a loan evaluation and management model that consists of four stages: borrower risk assessment; estimating borrower's needs; structuring a loan package; and loan management which includes establishing a follow-

up control system. Risk assessment, which consists of an evaluation of the firm's future prospects, is considered by the authors to be the most critical stage in the process. To conduct this assessment, the commercial lender must understand and assess the firm's economic and industrial environment and its internal strengths and weaknesses. Risk assessment also provides a framework for subsequently determining financing requirements and for managing risks. The second stage consists of determining financing needs and of assessing the sensitivity of the requirements to uncertainties identified in the risk assessment. The third stage involves structuring the terms of the loan, assuming one is forthcoming. Loan terms consist of: the amount, the repayment provisions, the collateral required, the interest rate charged and loan covenants and conditions. In sum, the terms of the loan allow the lending institution to modify the risks in order to achieve the appropriate risk/return profile. The fourth stage is loan management and consists of the monitoring processes that the banks employ to manage their risk exposure. Such monitoring focuses on the key risks and uncertainties, identified in the risk assessment stage, and goes hand-in-hand with the loan covenants and conditions. A notable omission in this model is the organizational framework, including bank philosophies, policies and procedures.

In a major study of banks and small business borrowers in Canada, Wynant and Hatch (1991) report on bank lending practices for small businesses. This study explored, among other areas, three aspects of credit decision-making; namely, the process used to evaluate credit risks, the factors that distinguish acceptable from unacceptable applications and the terms and features of approved loans. Data collection consisted of interviews with, and surveys of, bankers and clients, examination of actual credit files, and review of training provided to account managers. Results indicate that the banks focus primarily on risk assessment and that cash flow

and collateral are the two most important considerations in determining the level of risk. Potential revenues or returns and the amount of time required to manage the account (monitoring) were of secondary importance compared to the degree of risk. Collateral is considered to be necessary but not sufficient to obtaining financing. Risk ratings also reflect the character of the entrepreneur, the competitive structure of the firm's industry and the firm's ability to compete. Postponement of shareholder claims and life insurance on key principals are the most frequently used loan covenants. However, other conditions cover a wide range of options.

A more recent study (Thompson Lightstone and Co. Ltd., 1998), the third in a annual series designed to examine SME access to financing in Canada, explores the role of 70 variables in the account manager's loan approval decision. This study employs logistic multiple regression analysis and concludes, as in the two previous years, that the primary drivers of loan acceptance are ability to service the debt or cash flow, collateral, and the personal character or credibility of the entrepreneur. Except for the issue of account manager turnover, none of these studies specifically addressed the role of bank structure, philosophies or policies in lending decisions.

The Wynant and Hatch (1991) study provides some support for the role of the bank's organizational structure, commitment to small business, and the training and experience of account managers in the credit decision-making process. More specifically, this study found significant differences between the views of top management and account managers of the attractiveness of small business customers. Further, the skills and attitudes of bankers varied substantially, reflecting differences in experience, training and personality. Workload and tenure of account managers had an impact on risk assessment but not on lending terms. Similarly, collateral requirements

varied with the account managers' lending experience, attitudes to risk-taking and knowledge of clients.

From a client perspective, this study concludes "most small business managers have a poor understanding of the financing role of banks, and how applications are evaluated and managed" (Wynant and Hatch, 1991; 12). In addition, there are some significant differences as to the reasons for loan declines given by customers and those given by account managers. In particular, small business customers did not mention character, ability or credit history, although these factors were frequently cited in the credit files. As the authors suggest, "either the banker has not mentioned these considerations when justifying the bank's decision or the principal has chosen not to hear this aspect of the explanation" (Wynant and Hatch, 1991; 301). The same differences were reported in the Thompson Lightstone and Company Ltd. study (1998). In addition, respondents in the latter study mentioned a number of reasons not cited by account managers, the most notable being bank rules and requirements that are overly strict.

Additional research on lending to small businesses is organized and discussed here in the following areas: studies that develop and examine lending models; studies that explore the underlying relationships between lenders and entrepreneurs; and studies that examine the factors influencing lending decisions and credit terms.

### **2.3.1 Lending Models**

Doreen and Farhoomand (1983) propose a credit-scoring model for small firms that incorporates qualitative and quantitative factors. The authors argue that previous models either focused on predicting corporate bankruptcy (Altman, 1968) or on

commercial lending to large firms (Orgler, 1970) or limited their evaluation to financial data (Edmister, 1971). They highlight three key differences between small business loans and commercial lending to large firms. First, credit histories and financial ratios are often less useful in evaluating small and especially, new firms. Second, it takes just as long to review an application from a small firm as a large firm. Therefore, the opportunity cost is greater, as loans are usually for lesser amounts. Third, personal characteristics and capabilities of owner/managers are more important in evaluating loans to small firms. Model development starts with the "Cs" of credit and utilizes previous research to develop a list of potential factors that influence the extension of bank credit to small firms. A two-stage survey of financial institutions and subsequent discriminant analysis is used to develop the model. Respondents are drawn from commercial banks, finance companies, government departments, the Federal Business Development Bank (currently Business Development Bank of Canada) and venture capital firms. The most important contributing factors identified in this model include competitive situation, cash flow, owner/manager experience, equity, security, product, and communication skills. The authors also stress the importance of the judgement of the account manager in the lending decision, although the model does not specifically incorporate this factor.

McNamara and Bromiley (1993) use data from one US bank to develop and validate a model that incorporates a multilevel risk-rating scale. They utilize logistic regression to overcome some of the questionable assumptions associated with other types of analysis. The major contribution of the model is that it demonstrates the feasibility of predicting risk for small commercial borrowers. However, the model incorporates only financial measures or ratios, omitting such factors as management,



thereby limiting its usefulness. Further, the model is of little use with startup or new firms with no financial history.

Longnecker *et al.* (1997) review the literature on credit scoring and provide an overview of a number of approaches, including the Small Business Scoring Service (SBSS). SBSS was developed by Robert Morris Associates (an association of commercial loan officers and credit risk managers from over 3,000 member financial institutions) and Fair, Isaac and Co. (a computer software modeler). As in the case of McNamara and Bromiley (1993), this model uses logistic regression and incorporates factors such as financial condition, prior payment history, public filings, industry comparative data and company demographics. Some scoring models are developed from prior performance data of similar businesses while others are based on the owner's prior payment performance. It is argued that the use of credit scoring reduces the cost of serving smaller clients and improves the accuracy of predicting loan performance. The authors suggest the most significant implication of credit scoring is that it permits banks to price loans according to risk, a practice that has been uncommon in the past. Further, they speculate that the reduction in personal contact associated with credit scoring may be detrimental to aspects of relationship banking.

### **2.3.2 Banking Relationships and Information Asymmetry**

The significance and theoretical implications of information asymmetry and agency costs to the lending relationship have been discussed previously in the capital structure and credit rationing areas. The few studies that provide empirical evidence of the role and extent of these factors in commercial lending are discussed briefly here.

Binks *et al.* (1992) attempted to measure the extent of information asymmetries that exist between firms and UK banks. Using a postal survey, respondents (4000 firms) were asked to evaluate the extent and effectiveness of the information flows between the banks and their businesses. Respondents ranked the importance of four factors (knowledge of business, knowledge of industry, knowledge of market and provides helpful advice) to the service relationship and then rated the banks' ability to provide these services. The gaps between what the firms require and what they receive were analyzed at the aggregate level and by sector, size and growth rate to determine whether gaps are more pronounced for particular types of firms. Results indicate the gaps are more severe in terms of knowledge of industry and market, especially for firms in the manufacturing sector, for high growth firms and for declining firms. Smaller firms are also less satisfied in all three knowledge areas than are larger firms. The results of this research have implications for the provision of finance to small firms. As the authors indicate, it would appear the types of firms that require banks to take a more prospects-based approach are the very ones that are the most dissatisfied with the quality of services received. The concern is these perceptions may lead some firms to ignore traditional bank finance because they perceive the banks to be too poorly informed to understand their trading conditions.

An exploratory study (Ennew and Binks, 1997) of banking relationships in the UK uses data from a survey of banks and small firms to examine the benefits that accrue to both groups from various forms of participation, including personal interaction, information sharing and responsible behaviour. Personal interaction refers to factors such as trust, reliability, support and cooperation. Information sharing consists of providing both information that is required and voluntary information intended to enhance the service being provided. Responsible behaviour refers to the

appropriate exercise of duties and responsibilities. Findings indicate firms benefit from participation through improved service quality and better financing terms and conditions. Banks benefit through higher levels of customer satisfaction and loyalty. While there are limitations arising from the use of firm data as a proxy for bank behaviour, the results suggest that participation can be a useful mechanism for reducing the problem of information asymmetry in banking relationships. The authors suggest that participation may be even more important to young, entrepreneurial firms with high growth aspirations.

A recent study by Petty and Upton (1997) also examines the nature of the relationship between entrepreneurs and bankers. This study employs in-depth interviews with, and a survey of, bankers and entrepreneurs. The authors conclude relationships between bankers and owners affect the availability of financing but not the cost. The findings are based on perceptions and, as a result, the authors acknowledge that they have not been able to confirm whether the facts support these perceptions. This study also provides insights into the criteria used by bankers in making loans and in negotiating terms, which will be discussed in the next section of the literature review.

One of very few studies to explore banking relationships in the context of technology-based small firms was conducted in the UK by Philpott (1995). Philpott utilizes semi-structured interviews with high technology entrepreneurs to explore various aspects of the banking relationship. The underlying premise for the study is that high technology firms face significant information asymmetry problems as a result of technological uncertainty, bounded rationality and cognitive dissonance. These issues exacerbate adverse selection and moral hazard problems for finance providers and further constrain access to debt financing by small high technology firms.

Similarly, Philpott posits that collateral requirements pose significant problems<sup>4</sup> for small high technology firms whose assets are predominantly intangible. Results indicate that entrepreneurs perceive banks to lack an understanding of the nature of technology businesses and of technology, and to use collateral requirements in lieu of technology assessment. This is evident even in the case of banks that have technology managers. The impact has been to constrain access to debt financing, thereby limiting the growth potential of these firms. The problem is compounded by the finding that these firms are also fundamentally opposed to the use of outside equity capital.

Riding and Swift (1993) also use a sample of small firms to compare the banking experiences of high technology businesses to firms that place relatively little reliance on technology. In contrast to Philpott (1995), they find that none of the measures of borrowing experience indicate differences between technology-based firms and non-technology-based counterparts. Turndown rates, collateral demands and interest rates did not differ significantly between the two categories of firms.

Houston and James (2001) examine whether financial constraints faced by publicly traded firms vary systematically with reliance on bank debt and with the number of banks used by a firm. Results confirm "... that a close banking relationship lowers the cost of external financing for projects in which exclusive reliance on bank financing is feasible (Houston and James, 2001; 372).

### **2.3.3 Commercial Lending Processes and Decision Criteria**

A number of studies have examined lending decisions in an attempt to determine the relative importance of various factors to the decision whether or not to extend credit and to the associated loan terms and conditions. The vast majority of

these studies utilize the basic framework of the "Cs" of credit, namely capital, collateral, conditions, capacity and character, and previous research to identify relevant criteria. With few exceptions (Leblebici and Salancik, 1981; Fletcher, 1995a and 1995b; McNamara and Bromiley, 1997), these studies subsequently use surveys of, and interviews with, small business owners and bankers to determine the importance of these criteria. In some cases, the approach has been to examine reasons why banks decline requests (Robbie, 1986), while in other cases the focus has been on ranking (Petty and Upton, 1997) or rating the importance of factors (Ulrich and Arlow, 1981). In one case, simple frequency of mention (Gasse, 1990) is used as the measure of importance. The result has been a myriad of lists and criteria that provide some insights but little conclusive evidence as to the importance of these criteria. Further, none of these studies has examined lending in the context of knowledge-based firms.

Notwithstanding the limitations associated with much of the research in this area, there are some underlying themes and conclusions that are useful to the present research. First, it is clear that loan evaluation is a multidimensional process. Second, the large number of variables under study are interrelated and can be represented by a smaller number of independent factors. Third, in the risk/return trade-off, risk appears to outweigh return in importance to lenders. Fourth, risk is a function of ability to service the debt or cash flow and collateral, although business conditions and the character of the entrepreneur influence risk assessment. In addition, some researchers (Leblebici and Salancik, 1981; Fletcher, 1995a and 1995b; McNamara and Bromiley, 1997), as noted above, have taken a more grounded approach (Glaser and Strauss, 1967) to examining the decision-making processes employed in commercial lending. As a result, these studies provide a broader context within which to view the lending process. A review of these studies follows.

The earliest of these studies, conducted by Leblebici and Salancik (1981), reports on the effects of environmental uncertainty on structure and decision making in the loan departments of 41 independent banks in the United States. Although the focus is on personal lending, the study provides useful insights into the effects of environmental diversity and volatility on information and decision processes in banks. Utilizing typologies of Thompson (1967) and others (Lawrence and Lorsch, 1967; Duncan, 1972), the authors categorize environments in terms of their diversity (the range of an organization's activities) and their volatility (the rate of change among those activities). Diversity is a source of uncertainty that can be anticipated, whereas volatility cannot. Loan officers were presented with hypothetical applications and asked to estimate perceived probability of repayment and perceived uncertainty of the probabilities. They were also asked to indicate the decision strategies they would use, the authorizations they would need and the additional information they would require in order to make a decision. Results indicate that the normal operations procedures used by the banks to process loans varied with the diversity, but not the volatility, of their environment. The banks' organizational structures and processes for handling loan requests take account of uncertainty arising from diversity. Volatility was associated with the uncertainty experienced for particular decisions, and appears to be accounted for by the loan managers in their personal information acquisition strategies.

The study by Fletcher (1995a and 1995b) is one of few to examine lending decisions under circumstances that resemble, as much as possible, actual lending conditions. To achieve this situation, the researcher took on the role of the entrepreneur and was interviewed by 38 bank managers in branches of three Scottish banks. The bank managers were provided with a business plan in advance of the interview. The interview and the funding decision, as well as subsequent interviews of bank managers

on the importance of various criteria, provided the data for comparative analysis. The Scottish study replicated a previous study by Deakins and Hussain (1991) carried out in the West Midlands of England. Although the Scottish bankers were more favourably disposed to the proposal than the English bankers, the findings from both studies are remarkably similar. In both cases, financial information, leverage and collateral are the key factors in the risk assessment process, suggesting a capital-based approach to lending. The most significant contributions of this study lie in the methodology. The qualitative approach permits insight into the decision-making process, providing details that would be impossible to ascertain through a standard interview process. This approach also enables a comparison between banks' stated policies and procedures and the actual practices of account managers, although in this study, the extent to which bankers used such guidelines was not investigated specifically. Finally, data collection under conditions that mirror actual lending decisions minimizes the problems associated with recall and with individuals indicating one thing and doing something quite different.

A third study (McNamara and Bromiley, 1997) that utilizes data from actual decisions investigates organizational and cognitive influences on risk assessment in commercial lending. More specifically, this study examines two organizational variables: pressure for profitability and degree of formalization of decision processes, and three cognitive variables: ambiguity avoidance, cognitive reactions to portfolio effects, and the fads-and-fashions effect (excitement associated with certain industries). Results from this study make a strong case for the influence of organizational factors on risk assessment in commercial lending. While both organizational and cognitive variables influence decision-making in commercial lending, organizational factors appear to dominate. The organizational pressure for profitability resulted in newer

borrowers and borrowers requesting larger loans receiving more favourable treatment. These findings are clearly at odds with those supporting ambiguity avoidance (Ellsberg, 1961) and risk aversion related to loan size (Kahneman and Lovallo, 1993). The data also support the influence of standardization or formalization of decision processes on risk assessment. Standardization of the loan review process appeared to increase the sensitivity of lenders to the risk presented by borrowers. The most significant cognitive variable emerging from the data related to the fads-and-fashions effect. Lenders were more favourable in their treatment of firms in exciting industries, notwithstanding the fact that many loan officers indicated they avoided such industries because they are too risky. Finally, one of the most interesting findings and significant implications of the study is that the primary organizational effect found resulted from informal practices rather than the formal organizational policies and procedures.

In discussing the implications of their findings concerning the fads-and-fashion effect, McNamara and Bromiley (1997; 1084) suggest that "This pattern demonstrates how the addition of complex and subjective analysis by an expert (the banker) actually hurt the quality of the judgement." Judgement and intuition is investigated further in two additional studies. Research by Jankowicz and Hisrich (1987) explores the role of intuition in small business lending decisions. Findings from this study indicate two of the five "C's", capacity and character, depend largely on the intuitive judgement of the loans officer. Gasse (1990) in comparing decision-making for small business loans in general to new business loans in particular, concludes that judgement or intuition takes on greater importance in the latter cases.

One of the more recent studies analyzing the criteria used by bank officers in evaluating venture proposals is a study by Reitan and Waagp (1998). Although the focus of this study is on the evaluation criteria used in screening loan applications, its



main contribution results from the use of gap analysis to examine the ability of bank officers to assess the various criteria. Results indicate that bank officers perceive their ability to evaluate important criteria related to business strategy, such as market potential, customer need and competitive advantage, to be quite low. Similarly, they report low levels of ability to evaluate criteria they perceive as being of lesser importance, such as new technology, new markets and demonstrable concepts (i.e. prototypes). In combination, these findings have significant implications for new technology-based ventures and for firms operating in new markets. The study also makes a useful contribution by building on research undertaken in the venture capital industry. As the authors point out, this was done in light of the limited research made available on commercial bank lending.

The studies of the lending process and lending criteria discussed to this point are concerned primarily with the decision whether or not to extend credit. Additional research has focused more specifically on decisions concerning the terms and conditions associated with commercial loans. For example, Fabowale, Riding and Swift (1991) develop and validate a multivariate model of the factors influencing the terms of bank credit. Results of this research indicate that rates on loans to small businesses are primarily determined by a single dimension - capacity. In general, it was found that rates were not associated with the availability of collateral, the industrial sector of the firm, the urban or rural location, rates of sales growth, the organizational form of the business, the gender of the owner, the previous credit record of the owners, the age of the firm, or the financial management of the firm. The authors conclude by raising the question, "Could it be, that in the highly centralized banking environment in which most Canadian small businesses must operate, that the 5 C's are reduced to a

single C and that character, collateral, conditions, and capital are less important than capacity?" (Fabowale *et al.*, 1993; 39).

Apilado and Millington (1992) explore the use of restrictive loan covenants and risk adjustment in lending to small businesses. Covenants are used by banks to address agency problems and to mitigate risks. Typical covenants relate to dividend policy, liquidity, profitability and leverage. Results demonstrate that more loan covenants are used with small firms and that small firms have substantially higher interest rates in addition to more covenants. The authors conclude that small firms may be paying interest rate premiums that are unwarranted given the propensity of banks to also use more covenants. One outstanding question arising from this study is whether or not banks make a connection between the interest rate charged and the use of covenants?

Rosman and Bedard (1999) investigate loan structuring decisions including the use of collateral and covenants using computerized process tracing. Findings from their research confirm that loan structure decisions may be contingent on the way loan officers analyze information.

Research into commercial lending, although not focused on knowledge-based businesses, makes a number of useful contributions to the present study. First, it provides a framework that can be adapted for use in examining institutional lending decisions in the context of KBBs. Second, it provides a limited empirical body of evidence on the financing experiences of small firms against which findings from the present study may be compared. Third, it identifies supply-side factors and lending criteria that can be explored in terms of lending to knowledge-based businesses. Finally, a few studies use a grounded approach to examine decision-making processes, suggesting a broader context within which to explore lending to KBBs.

## **2.4 Venture Capitalist Decision-Making Processes and Criteria**

Venture capital is broadly defined as "... capital which is not secured by assets and is invested in or loaned to a company by an outside investor" (Association of Canadian Venture Capital Companies, 1992; 7). Previous research related to venture capital investment is considered here for a number of reasons. Unlike the banking situation, there is a considerable body of literature on venture capital decision-making processes and criteria. As discussed previously, at least one study (Reitan and Waagp, 1998) has been able to utilize this research in the commercial lending context. Further, there are similarities between venture capital investing and lending, especially in terms of information asymmetry, agency costs and monitoring, although a notable difference concerns the absence of collateral or security. In some cases, venture capitalists actually provide debt as well as equity.

The high risk associated with the provision of venture capital is such that firms with fewer tangible assets have very often been the beneficiaries of such investment. Technology-based ventures with high requirements for investment in research and development and long lead times to achieve commercial viability are good examples. In 1997, investment by members of the Canadian Venture Capital Association in technology-based ventures accounted for 63 percent of the businesses financed (Canadian Venture Capital Association, 1997). Further, it appears that venture capital investments in smaller firms (annual revenues of less than \$5 million) have increased to the point where they accounted for a majority (51%) of the funds invested in 1997. These technology-based small firms represent a significant portion of firms in the knowledge-based sectors that are the focus of the present research. Finally and equally noteworthy, is the fact that the availability of venture capital for early stage investment

has increased by more than fivefold over the last three years, indicating an increasing propensity for venture capitalists to provide seed and start-up financing. The result is the need for venture capitalists to assess firms with little or no history and with few tangible assets, a situation not unlike that faced by the banks when lending to knowledge-based businesses.

Although the literature on venture capital investing is more extensive than the available research on commercial lending, it is also highly fragmented. With few exceptions (Fried and Hisrich, 1994; Hall and Hofer, 1993; Shepherd, 1997), the vast majority of the studies of venture capital investing are survey-based and involve respondents rating or ranking predetermined decision criteria (Johnson, 1979; Kryzanowski and Giraldeau, 1977). Most studies focus on venture capitalists, although some also examine the perceptions of entrepreneurs (Bruno and Tyebjee, 1983). Participants are usually asked to indicate the importance of various factors to the decision to invest but in some cases the focus is the factors underlying negative decisions (Johnson, 1979). Only a few studies utilize a decision-making framework or process model to investigate factors at different stages in the process (Bruno and Tyebjee, 1984; Boocock and Woods, 1997). With few exceptions (Pence, 1981; Sandberg, 1987 and 1988; Zacharakis, 1998; Zacharakis and Sheppard, 2001), most examine criteria without reference to particular decisions or specific proposals. Still others replicate previous studies in an attempt to compare practices in various countries (Knight, 1986 and 1990). Finally, a few of the studies deal with technology-based firms (Pence, 1981; Tyebjee and Bruno, 1981) and sectors such as biotechnology (Bogle and Ruber, 1992), providing insights into potential differences related to the intangible nature of the assets of investee firms. An overview of this research follows, including limitations and implications for the present research.

In one of the earlier studies, Kryzanowski and Giraldeau (1977) employ a survey to compare the selection criteria of Canadian and American venture capitalists. Participants are asked to provide a relative ranking of risk criteria by allocating points (weightings) to a number of risk components of a venture capital investment. The results suggest that both groups consider the assessment of management to be the most important criterion. Key components of management include the financial commitment of the entrepreneur, managerial competence, and integrity and reliability. Other factors identified in order of importance included: product, market, track record, physical security, variance in profitability and years in existence of the company. One respondent provided the following observation with respect to the difficulties and limitations associated with abstract assessments, "... nor do I think it is possible to objectively weigh different factors on a theoretical basis, although you might be able to do it given a particular situation" (Kryzanowski and Giraldeau, 1977; 33). A subsequent study (Johnson, 1979) that focused on the reasons why entrepreneurs are denied financing by Small Business Investment Corporations (SBICs) and venture capital firms came to a similar conclusion regarding the primary importance of management.

A study by Tyebjee and Bruno (1981) represents the first attempt to integrate research on three aspects of venture capital investment: the management process in venture capital firms, including decision processes and work flow; the relationship between evaluative criteria and actual decisions; and market efficiency and the risk/return trade-off. This research, conducted in stages, provides insights into the processes and criteria employed in deal evaluation and risk evaluation. A rank ordering of evaluative factors in terms of their association with a positive investment decision confirms the importance of management quality. The degree of innovation, the stage of

product development and the nature of the market receive little emphasis. A follow-up study (Bruno and Tyebjee, 1983) to determine perceptions of entrepreneurs who are denied financing by venture capitalists indicates similar reasons, although the entrepreneurs were less likely to ascribe the reason for denial to their own management limitations.

A subsequent study by Tyebjee and Bruno (1984), that models the investment process of venture capitalists, distinguishes between factors that are important at two stages: screening and evaluation. At the screening stage, the following factors are important: the size of the investment and the policy of the fund, the technology and the market sector, the geographic location of the venture and the stage of financing. At the evaluation stage, venture capitalists rated deals on the basis of 23 factors. A five-factor solution explains 60.4 percent of the variation. These are: market attractiveness including size, growth, need and accessibility; product differentiation, including uniqueness, legal protection and high profit margin; managerial capabilities including breadth of functional management skills and favourable references; environmental threat resistance, including changing technology, sensitivity to economic conditions and barriers to entry; and cash-out potential or opportunity to liquidate. The two factors with the greatest impact on risk perceptions were lack of management capabilities and resistance to environmental threats. Similarly, two factors had the most significant impact on expected return: attractive market conditions and a highly differentiated product. A follow-up validation indicates that the model may underrepresent the importance of the quality of the management team in the initial screening process. Also, there was considerable disagreement with the statistical results suggesting that the quality of the management influences risk but not expected return. One very interesting observation came from a respondent who indicated not

formally distinguishing between risk and return, as was implicitly assumed in the formulation. The other important contribution of this paper is the empirical support for a model of the venture capital decision process. Such models have been developed in previous research on venture capital (Hoffman, 1972; Poindexter, 1976; Timmons and Gumpert, 1982; Wells, 1974), and posit a sequential process of venture capital activity consisting of the following stages: deal origination; deal screening; deal evaluation; deal structuring; and postinvestment activities.

Pence (1981) provides a useful framework for investigating the investment decision-making processes of venture capitalists, especially in the traditional areas of return on investment, risk and liquidity. This study is based on investments in start-up, technologically innovative enterprises and utilizes hypothetical venture proposals. The research design is particularly interesting. Three venture plans were designed which included information in eight categories that venture capitalists evaluate in making their investment decisions. The eight categories were determined through initial interviews with venture capitalists and reflected three primary factors that venture capitalists considered important: management qualifications; financial projections and related market information; and potential exit opportunities. Second interviews, following the review of the venture plans, resulted in the compilation of 21 categories for recording venture capitalists' responses. Risk and return measures were also included.

A 1985 article by Macmillan, Siegel and Narasimha, provides a follow-up and comparison to Tyebee and Bruno's 1981 study. This study employs survey methodology to identify and explore 27 criteria grouped into six areas: two related to the entrepreneur, and one each related to the product, the market, the venture team and financial. Factor analysis employing the concept of managing risk is used to identify six risk categories as follows: competitive risk, bailout risk, investment risk,

management risk, implementation risk and leadership risk. The authors conclude that the major shift that has occurred since Tybjee and Bruno's (1981) study is that venture capitalists have reduced their expectation of specific skills (marketing, technical, etc.) on the part of the entrepreneur and shifted these expectations to the venture team. A UK study (Dixon, 1991) provides further evidence of the importance of the management team to reducing risk and increasing potential returns from venture capital investments.

A 1986 study by Knight replicates the MacMillan *et al.* study (1985) and compares Canadian venture capitalists to their US counterparts. There are some slight differences but generally the results are remarkably similar. A 1990 study by Knight extends the analysis to include Asia and Europe and concludes that all groups have similar concerns and rank the criteria in a similar way, with few exceptions. The entrepreneur's personality and experience rate much higher in general than the product or market characteristics or financial considerations. This is especially true of the Canadian firms. Knight (1994) provides some longitudinal data in a follow-up study four years later in Canada in which he indicates that responses had moved upward on all dimensions, much closer to the US responses. However, he concludes high technology investments are not nearly as popular with venture capitalists in Canada as in the US.

A subsequent study by Macmillan *et al.* (1987) provides a useful link between selection criteria and subsequent performance. This study identifies two critical criteria that are predictors of venture success, not identified in the previous study (Macmillan *et al.*, 1985): market acceptance and competitive threat. The conclusion drawn is that the factors identified in the earlier study were not good predictors, not because of having limited value but because the venture capitalists had already applied them in the



screening process to weed out undesirable ventures. This finding reinforces the importance of examining factors at various stages in the investment process.

A 1987 study by Khan utilizes two noncompensatory actuarial models, conjunctive and disjunctive, to model both venture capitalists' judgements (expected outcomes) and the environment (actual outcomes). A disjunctive decision process places strong emphasis on one or two attributes in judging a potential investment. A conjunctive process ensures that a prospective investment is satisfactory at a minimum level on each attribute. Results indicate that conjunctive models were generally superior predictors. Further, the environment-based conjunctive and disjunctive models were far more successful predictors than the judgement-based models, suggesting that support systems to aid venture capitalists are entirely feasible. In arriving at their judgements, venture capitalists emphasized the entrepreneur's desire for success and the nature of the product. The most important variable in the environment-based model was the creativity/ingenuity of the entrepreneur. Predictor variables were drawn from a review of the literature and from interviews with a sample of prominent venture capitalists.

A pilot study by Sandberg, Schweiger and Hofer (1988) explores the use of verbal protocols to determine venture capitalist decision criteria. The authors argue that human decision making cannot be understood by simply studying final decisions; "examining decision processes, rather than merely criteria, is vital to capturing venture capitalists' wisdom." The message is that perceptual, emotional and cognitive processes must also be studied to gain a greater understanding of human decision making. The authors conclude that greater understanding of decision processes could help to identify noncompensatory criteria and the conditions governing contingent criteria or weightings.

A study by Florida and Kenney (1988), although not directly related to venture capital decision making, raises the issue of the importance of contact networks and information to both deal flow and investment monitoring and goes a long way toward explaining why venture capitalists cluster together. Clustering of knowledge-based businesses may have implications for lending structures and decision-making processes (Nordicity Group Ltd, 1997).

Rea (1989) surveys venture capitalists in an attempt to compare the factors that underlie successful negotiations for seed/start-up financing to those that explain failed negotiations. Results indicate that market opportunities with significant growth potential are much more important than product factors in successful negotiations. Failed negotiations are explained largely by the lack of credibility of the plan and the management team.

Hisrich and Jankowicz (1990) employ repertory grid structure to explore the role of intuition in venture capital decisions. This study makes comparisons to similar work by the authors studying small business loan decisions (Jankowicz and Hisrich, 1987). One way in which the venture capitalists differ from the loans officers is their low cognitive complexity - a remarkably high proportion of the construct variance relates to a single theme - that of adequacy of management. The authors conclude that this difference may be attributable to the level of the decision-maker (seniority of role) - more senior in the case of the venture capitalists and more junior in the case of the loans officer, and cite work by Isenor (1984) to support this conclusion.

A 1992 study by Bogle and Ruber explores venture capital financing of the biotechnology sector. The authors conclude that venture capitalists are more interested in late rather than early-stage stage firms and approach biotechnology investments in much the same way as other investments, heavily weighting the personal qualities and

experience of the entrepreneur, the presence of a balanced management team and the existence of strong business and management skills. Unfortunately, they perceive these competencies to be largely missing from the sector.

A 1993 study by Rosman and O'Neill compares the decision behaviour (information acquisition strategies) of venture capitalists that provide debt financing (mezzanine financing) to commercial lenders. Using a computer-based experiment, the authors conclude that venture capitalists showed a stronger preference for strategic data and less interest in historical financial data. Both groups minimized the use of financial forecasts and followed decisions processes persistently across different types of companies (startup and well established).

A 1993 study by Hall and Hofer uses verbal protocol analysis to explore the decision-making processes used by venture capitalists. The study recognizes the multistage, multicriteria and multiperson nature of the venture evaluation process and argues for the use of a research approach (verbal protocols) that captures the full range of data nuances and conditionality. The findings contradict much of the previous research with respect to the importance of the entrepreneur/entrepreneurial team and the strategy of the proposed venture (at least during the early stages of the venture evaluation process).

Schilit and Chandran (1993) explore the potential contribution of decision making and organization theory to the venture capital decision process. The authors argue that research in this area has concentrated on its organizational and environmental aspects but not on its individual or social-psychological aspects. Much of the research has found support for a rational decision-making approach from the economics and behavioral literature in which investors make decisions based on the risk/return nature of the investment opportunities. The authors conclude that the

transactional or mechanical aspects of venture capital funding can be explained adequately by theories of economics and finance, but the human aspect, or more precisely, the process of decision making itself, can be explained better by organization theory.

Carter and Van Auken (1994) examine the importance to potential investors of the stage of development of venture firms and its relationship to project evaluation criteria. Based on 69 surveys of US venture capitalists, the authors conclude investors have preferences for projects that are in particular stages of development and investment criteria differ between those who prefer early-stage investments and those who prefer later stage investments. The former are less interested in the management of risks than the latter but are more concerned with liquidity. Early-stage investors appeared more willing to exercise control and replace management if necessary.

Fried and Hisrich (1994) further explore the criteria and process that venture capitalists use to evaluate potential investments. The authors identify 15 criteria that are generic to all venture capitalists. These criteria are based on the three basic constructs identified by Hisrich and Jankowicz (1990): concept, management and returns. Results are compared to the findings of MacMillan *et al.* (1985) on criteria and to Tyebjee and Bruno (1984) on the process model. The paper makes a very useful contribution to research methodology by employing case research, grounded theory (Glaser and Strauss, 1967) and replication logic (Eisenhardt, 1989).

Landstrom (1994) argues that previous research has been largely descriptive and makes a strong case for examining the venture capital investment process in a decision theory framework. The author provides an overview of the decision theory literature in the areas of decision process theories (rational decision theories, political decision theories, action rational theories) and cognitive-oriented theories (cognitive maps,

cognitive style) and decision making under risk and uncertainty (expected utility, attitude toward risk, prospect theory). Using case study research and survey studies, the author presents results which indicate the importance of "momentary relationship" (intuition, social attraction and trust) and thus action rationality in the venture capital decision-making process. The venture capitalist's risk management strategy also seems to constitute an important explanatory variable to determine the type of decision rationality used. Venture capitalists that rely on portfolio theory (broader investment strategy) appear to utilize decision rationality whereas venture capitalists that use an operative risk management strategy (narrowly defined as to market and products) appear more likely to use action rationality.

A recent UK study (Boocock and Woods, 1997) focuses on the activities of a single fund to explore the relationship between investment criteria and the stages of the investment process. Results confirm that the decision-making process is multi-staged and that different criteria are considered at each stage. However, three criteria appear important: the specific requirements of the fund, the market and management. The model demonstrates that it is not possible to deal independently with the two issues of the decision-making process and evaluation criteria.

More recently, Shepherd (1997 and 1999) and Zacharakis and Myer (1998) have questioned the reliability of results from research that assumes venture capitalists can accurately relate their own decision processes. Shepherd utilizes conjoint analysis to focus on concurrent rather than retrospective techniques for collecting and analyzing decisions. Results indicate that conjoint analysis provides a more valid assessment of respondents' decision making. Self-reports by venture capitalists overstated the least important and understated the most important criteria. Zacharakis and Myer (1998) use policy capturing technique in a controlled experiment to compare captured decision

policies to stated decision policies. Policy capturing required the venture capitalists to make a series of real time decisions based on various information factors. The authors conclude that people have a tendency to overstate the information they believe they relied upon and to use far less information (typically three to seven factors) to make a decision than they actually think they use. The findings from both studies confirm that venture capitalists are not good at introspecting about their own decision process.

Subsequent work by Zacharakis and Sheppard (2001) using policy capturing experiment provides evidence that venture capitalists are overconfident when making investment decisions and that overconfidence has a negative impact on decision accuracy. Similarly, Zacharakis and Myer (2000) use policy capturing experiment to demonstrate the success of using actuarial decision models to improve venture capital investment decisions. The methodologies employed in these studies have the potential to identify the more relevant information factors cited in previous research.

The significant focus of much of the previous research on the importance of management led Smart (1998) to study the methods that venture capitalists use to conduct human capital evaluations. Human capital valuation is defined by the author as the "... process of appraising the human capital (people) in a venture." The methodology consisted of interviews with venture capitalists using a fact-based questionnaire. Findings indicate considerable variation in the way venture capitalists conduct human capital valuations, although the work sample approach, consisting of sessions in which the venture capitalist "quizzes" the entrepreneur, is the preferred method. Reference interviews (discussions with others about the entrepreneur) and past-oriented interviews (focus on career history and accomplishments) are next in importance to work samples. Results confirm that venture capitalists consider this to be an extremely important area and devote considerable time to the task of human capital

assessment. Further, the use of past-oriented interviews and work samples were positively related to accuracy of the valuations. Although this study does not provide a definitive theory of human capital valuation, it does confirm that human capital can be appraised and the accuracy of the assessment depends on the method used.

Finally, as mentioned in the introductory chapter, there is a growing body of research devoted to the study of the informal market for risk capital often referred to as “business angel” financing. In addition to providing evidence of the contribution of the informal risk capital market to the start-up and growth of small firms, this research has examined aspects of investing and decision-making processes that may be useful to the study of KBB lending (Aram, 1989; Fiet, 1991; Mason and Harrison, 1996a and 1996b). For example, Aram (1989) explores the role of business angels in start-up and technology-based ventures, firms that represent a major focus of the present study. Fiet (1991) compares how formal venture capitalists and informal investors manage agency risk and market risk. Agency risk relates to principal-agency theory discussed previously, while market risk relates to uncertainty associated with competitive conditions. Among other areas, Mason and Harrison (1996a and 1996b) make important contributions to understanding the investment processes of business angels and to the relative importance of investment criteria at various stages in the evaluation process. The present study will also examine risk assessment at two stages of the lending process.

In summary, the research in the venture capital area has much to offer in terms of understanding the decision-making processes and evaluative criteria of venture capitalists. Confirmation of the multi-staged nature of the investment process and of the relationship between the criteria and the process should be useful in examining lending processes and lending criteria. With the exception of Hall and Hofer's (1993)

study, findings unanimously confirm the critical importance of the entrepreneur/entrepreneurial team to the investment decision. However, the most significant contribution of this literature is the recognition and confirmation of the importance of examining actual decision processes. A number of methodologies appear to have been employed successfully in attempts to replicate the decision processes and minimize problems associated with introspection.

Notwithstanding these contributions, there are some significant limitations associated with this body of research. Since the studies were conducted at different points in time, they may be affected differently by cyclical factors that influence the venture capital industry. The use of diverse methodologies with different samples to explore different research questions raises concerns of reliability. Categorization of responses varied considerably across studies. In some cases, the unit of analysis was the venture capitalist, while in others it was the deal. Taken together, these limitations make comparisons difficult and often impossible. In a number of cases, biases were introduced through the use of predetermined criteria. Finally, as discussed previously, many of the studies relied exclusively on self-reported data, raising questions of validity. This problem was often compounded by the lack of a model or underlying theory.

## **2.5 Valuation of Intellectual Capital and Knowledge-Based Assets**

The shift to a knowledge-based economy has resulted in increased attention being paid to the relationship between intangible assets and firm performance (Miller, 1996). Previously, in the absence of generally accepted methods for valuing intangibles and because of the high degree of subjectivity involved, the professional



accounting bodies had discouraged companies from capitalizing intangible assets. However, since the Arthur Anderson and Co. study (1992) that suggested approaches to dealing with these problems, an increasing number of firms are reporting intangible assets in their financial statements (Miller, 1996). While there is still resistance from financial institutions to basing lending decisions on the value of intangibles, there appear to be a growing number of commercial banks acknowledging that intangible assets can be collateralized in the same way as physical assets.

The definition of intangible ranges from "the intellectual property rights of patents, trademarks, copyright and registered design; through contracts; trade secrets; public knowledge such as scientific works; to the people-dependent, or subjective resources of know-how; networks; organizational culture, and the reputation of product and company" (Arthur Anderson and Co., 1992). Growing interest from a number of constituencies in valuing intangibles has led to some recent theoretical research (Bontis, 1996; Brooking and Motta, 1996; Edvinsson and Sullivan, 1996; Saint-Onge, 1996; Stewart, 1997) on valuing intellectual capital and knowledge-based assets. As with the study by Smart (1998) dealing with human capital valuation discussed in the previous section, this research may be quite useful in the context of lending to knowledge-based firms. As a result, brief summaries of the theoretical models are presented here.

Edvinsson and Sullivan (1996) propose a model of the knowledge firm as a basis for managing intellectual capital. Underlying the model is a definition of intellectual capital as knowledge that can be converted into value. In discussing intellectual capital, the authors stress the importance of understanding knowledge in a business context. Business knowledge is of two types: codified knowledge, that which can be written down, transferred, and shared and tacit knowledge, that which can be

demonstrated but not codified. Further distinctions of knowledge include whether knowledge can be visualized, degree of complexity, and whether or not knowledge can stand alone.

The model developed by Edvinsson and Sullivan (1996) includes four intellectual capital components: human capital, structural capital, intellectual property and complementary business assets. The authors define human capital as the collective capabilities of employees to solve customer problems. Human capital is enabled by the firm's structural capital or intellectual assets, defined as the codified, tangible, or physical descriptions of specific knowledge to which a company can assert ownership rights. Intellectual assets can be further subdivided into three categories:

- Commercializable assets (products, services and processes)
- Customer-related assets (relationships, agreements and history)
- Structure-related assets (plans, procedures and processes)

Intellectual assets become intellectual property when legal protection has been obtained. Complementary business assets are structural capital assets used to create value in the commercialization process. Such assets might include processing facilities, distribution networks, prospect lists, supplier networks, service forces, and external organization capabilities. Some of these are generic assets that can be bought on the open market whereas others are specific assets that are unique and are created in conjunction with the commercialization process. Value in the knowledge firm model results from two sources: innovations which are generated by the human resources, converted into intellectual assets and legally protected, and conversion by the firm's structural business assets.

In discussing the role and importance of tacit knowledge to intellectual capital development and value creation, Saint-Onge (1996) introduces the element of customer

capital in addition to human capital and structural capital. For Saint-Onge, customer capital is "... the depth (penetration), width (coverage), attachment (loyalty), and profitability of customers" (Saint-Onge, 1996; 10). Structural capital consists of four elements: systems, structure, strategy and culture. Within the three areas of intellectual capital, there are two types of knowledge: explicit or articulated knowledge and tacit knowledge, which includes individuals' intuition, perspectives, beliefs and values formed from their experiences. The article by Saint-Onge is essentially a description of the approach that the Canadian Imperial Bank of Commerce (CIBC) has developed to manage intellectual capital and tacit knowledge within their own organization.

In describing various approaches to measuring intellectual capital, Stewart (1997) groups measures into four categories: measures of the overall value of intangibles, human capital measurements, structural capital measurements, and customer capital measurements. While much of Stewart's approach appears more useful to valuing intellectual capital in existing firms rather than start-ups, the structural capital measures provide a useful framework for categorizing intangible assets as follows: technical (trade secrets, formulas, proprietary test results, etc.); marketing (copyrights, corporate name and logo, warranties, advertising, package design, trademark registrations, etc.); and skills and knowledge (databases, manuals, quality control standards, asset management processes, security systems, business licenses, noncomplete clauses, and proprietary management information systems).

In describing intellectual capital, Bontis (1996) refers to both Edvisson's and Saint-Onge's models as including relational capital, a much broader concept than customer capital. For Bontis, relational capital refers to the organization's relationships or network of associates and their satisfaction with and loyalty to the company.

Brooking and Motta (1996) propose a taxonomy of intellectual capital that consists of four categories of intangible assets: human-centred assets, intellectual property assets, infrastructure assets and market assets. The authors define Human-Centred Assets as the collective expertise, creative capability, leadership, entrepreneurial and management skills held by the employees. Intellectual Property Assets include know-how, copyright, patents, etc. Infrastructure assets include the technologies, methodologies and processes that allow organizations to function. Finally, Market Assets refer to such market-related intangibles as repeat business, goodwill, branding, market dominance, etc. that clearly have value to the firm. Building on this taxonomy, the authors propose an approach to auditing, recording and valuing intellectual capital.

There are some obvious similarities in these five models of intellectual capital. Each deals specifically with human capital and structural capital. With the exception of Edvinsson and Sullivan (1996), the others also include customer capital or as Brooking and Motta (1996) suggest, market assets. The distinction that Edvinsson and Sullivan (1996) draw between structural capital and complementary business assets is somewhat unclear, although many of the examples of complementary business assets reflect the broader concept of relational capital introduced by Bontis (1996). Intellectual property also is included in all of the models with the exception of Saint-Onge (1996). Given his focus on ways of creating value through intellectual capital at the CIBC, the omission of intellectual property assets is somewhat understandable. In total, these models provide a basis on which to examine the approaches used by the financial institutions in the present study when valuing intellectual capital and knowledge-based assets.

## 2.6 Summary

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The literature review suggests that it is not sufficient to rely on single theory explanations of small firm financing and commercial lending decisions. Traditional financial theory assumes efficient capital markets where investors and entrepreneurs have access to complete information. While this may be the case for large public firms, small private firms face a different reality, one where access to capital markets is much more limited and where ownership is more closely-held (Stanger, 1992). Further, according to Van Auken (2001; 241), "... violations of capital market theory may be even more significant for owners of technology-based firms due to high risk, apprehension of investors, and limited financial experience of the owners." Similarly, Zingales (2000) argues that existing financial theories have been modeled on the traditional business corporation which he characterizes as asset-intensive, vertically-integrated and highly centralized. He indicates that while existing theories provide important insights into capital structure decisions, new theories may be required to explain financing decisions in the context of the emerging human capital-intensive firm.

Credit rationing theory also fails to fully explain lending and financing decisions as related to small firms. Overall, the literature in this area is highly theoretical. As with capital structure theory, the various credit rationing models make assumptions that are clearly at odds with the small firm environment, thereby limiting their usefulness in explaining finance decisions.

All indications from the literature review point to the potential multi-dimensional nature of the lending process in terms of multi-stages, multi-persons and multi-criteria and to the need to integrate multiple theoretical perspectives from the

capital structure, credit rationing and commercial lending areas in order to understand lending and financing decisions in the context of knowledge-based businesses.

The best potential explanations of supply and demand-side decisions relate to theories that underlie each of these areas, particularly information asymmetry. Information asymmetry appears to be particularly problematic in the case of the new small knowledge-based firm where the absence of historical performance is compounded by the lack of tangible assets. Many of these firms operate in innovative growth sectors where the uncertainties associated with predicting future outcomes also may be exacerbated. Not surprisingly, entrepreneurs also have much more positive expectations of potential profitability and success compared to lending institutions. Information asymmetry, arising from these differences in expectations and from uncertainties associated with predicting future outcomes, likely results in the problem of adverse selection (Akerlof, 1970) for financial institutions.

There is evidence that banks have responded by implementing structures and processes to deal with these issues, especially in the context of knowledge-based businesses. Banks may also ration credit in response to adverse selection as posited by credit rationing theory (Jaffe and Russell, 1976) or use collateral as an alternative to credit rationing as suggested by others (Stiglitz and Weiss, 1981; Bester, 1987; Chan and Kanatas, 1985). It is also possible that information asymmetry results in moral hazard, incentive effects, and monitoring and bonding costs as posited by agency theory (Jensen and Meckling, 1976).

Notwithstanding the potential contribution of individual theories, the literature review revealed no overall theoretical framework specifically focused on KBBs that can be used to generate testable hypotheses regarding lending to such businesses. Traditional financial, credit rationing and commercial lending theories fall short in their

ability to individually explain lending and borrowing decisions from a small firm perspective and are even less adequate for understanding these issues in the context of knowledge-based businesses. Findings from empirical studies provide some demand-side evidence of the financing experiences of SMEs, as well as a limited supply-side perspective on institutional lending. However, empirical evidence concerning KBBs is extremely limited. As a result, this dissertation utilizes an exploratory approach to examine lending to KBBs from both demand-side and supply-side perspectives. The proposed research framework and specific research questions are outlined and discussed in the next chapter.

## **CHAPTER 3**

### **RESEARCH FRAMEWORK AND QUESTIONS**

#### **3.0 Introduction**

The primary purpose of the present study is to increase our understanding of institutional lending to knowledge-based firms, especially at the start-up stage. More specifically, the study is intended to achieve the following research objectives:

- i. to investigate the experiences of entrepreneurs in knowledge-based firms who have sought financing from chartered banks and government agencies;
- ii. to facilitate understanding of the process of lending to knowledge-based businesses in Newfoundland and Labrador;
- iii. to identify and compare the present practices of government departments and agencies with respect to risk assessment of knowledge-based firms;
- iv. to identify and compare the present practices of Canadian chartered banks with respect to risk assessment of knowledge-based firms; and
- v. to compare the lending processes and criteria utilized when lending to high knowledge-intensive firms to those used in lending to less knowledge-intensive businesses.

To achieve the specific objectives of this research it is essential to consider lending from both demand and supply sides. The demand-side includes entrepreneurs' financing decisions and experiences with access to institutional debt financing, while the supply-side represents the lending decisions of financial institutions.



The review of the literature related to the demand-side suggests the theoretical determinants of capital structure are based on assumptions of efficient capital markets and do little to explain financing decisions in the context of small firms. Nonetheless, the work of Ou (1988) and others (Stanger, 1992; Barton and Matthews, 1989; Pettit and Singer, 1985) arguing for the importance of integrating agency theory, information asymmetry and owner's objective function may prove useful to understanding the financing decisions and experiences of small knowledge-based firms.

Similarly, the literature review revealed a myriad of supply-side explanations for lending decisions based on traditional financial and credit rationing theories. Lending models have been developed almost exclusively in the context of large established firms with long financial histories (Altman, 1968; Orgler, 1970). Many of these models also rely on financial information (Edmister, 1971), especially historical data (McNamara and Bromiley, 1993; Longnecker *et al.*, 1997) to develop financial measures and ratios. As such, they are not particularly helpful to explaining lending decisions in the context of new, small knowledge-based firms. Further, no studies were identified that addressed lending decisions from the perspective of government funding agencies.

Overall, the results of the literature review indicate a lack of theoretical and empirical research necessary to generate testable hypotheses and the lack of a comprehensive model to guide the investigation (Selltitz *et al.*, 1967). Information asymmetry and the underlying problems of agency conflicts, adverse selection and moral hazard provide only partial supply and demand-side explanations for institutional lending, especially in the context of new, small knowledge-based firms. As a result, the present study uses an exploratory research approach based on addressing a number of critical research questions to investigate institutional lending.

### 3.1 Areas of Investigation: The Demand-Side

The literature review on the demand-side included theoretical and empirical research on capital structure and empirical studies of the financing experiences of knowledge-based SMEs. Information asymmetry appears to offer the best theoretical explanation for financing decisions in the context of small knowledge-based firms. Ou (1988) provides a demand-side perspective on capital structure determinants that may be directly applicable to knowledge-based SMEs. In arguing for the importance of information asymmetry in explaining financing decisions, Ou suggests that access to financing and the cost of borrowing are affected by the reluctance of such firms to disclose information given the proprietary nature of their products and processes. As a result, lenders either must collect additional information at increased costs or rely on collateral as a substitute. In the absence of collateral, borrowers either bear additional costs or they are unable to access financing. Van der Wijst (1989) similarly argues for the importance of such information costs to small and young firms operating in dynamic industries, as much of their expertise and knowledge is intangible.

Empirical research on information asymmetry also helps to explain financing decisions and experiences of entrepreneurs. The results of Binks *et al.* (1992) confirm that the types of firms requiring banks to take a more prospects-based approach to lending are the very ones that are the most dissatisfied with the quality of the services they received. Similar findings are reported for knowledge-based SMEs in Canada, indicating they "...are considerably less satisfied overall with their main financial institution than are SMEs in general" (Thompson, Lightstone and Company, 1998; 174).

Binks *et al.* (1992) find that knowledge-based businesses perceive the banks to be inadequately informed of their situation and suggest these perceptions lead some firms to ignore traditional bank finance. Similarly, Philpott (1995) indicates that banks lack an understanding of the nature of technology-based businesses and use collateral requirements in lieu of technology assessment. Evidence provided by Philpott (1995) suggests this is the case even for banks that have technology managers. However, Riding and Swift (1993) provide contradictory evidence, concluding that measures of borrowing experience do not differ between technology-based firms and their non-technology counterparts.

Wynant and Hatch (1991) and Thompson, Lightstone and Company Ltd. (1998) provide additional insights on the differing perceptions of entrepreneurs and account managers regarding the decision criteria employed by the banks and the reasons for loan declines. These studies indicate significant differences between the reasons for loan declines cited by entrepreneurs and those actually given by account managers. Of particular note, is the fact that entrepreneurs felt overly strict bank rules and requirements was an issue, while account managers did not mention this factor at all. While differences in level of knowledge-intensity were not examined, it is an empirically testable hypothesis that perceptions of entrepreneurs in knowledge-based firms, concerning the importance of various lending criteria, differ from those in less knowledge-intensive firms. As a result, the present research investigates entrepreneurs' perceptions of the approaches used by the various lending institutions.

In terms of access to debt financing, some empirical evidence confirms constraints faced by knowledge-based firms both in the United States (Brewer *et al.*, 1996) and in Canada (Industry Canada, 1994a; Thompson, Lightstone and Company, 1998). Brewer *et al.* (1996) confirm that debt is more likely to be used to finance

projects that generate tangible assets and that firms whose value depends on information and research and development are less likely to receive debt financing. However, the authors also report conflicting results indicating that firms in industries with more intangible assets are more likely to receive debt. Although unable to fully explain the contradiction in these two findings, the authors suggest that financing decisions may be more closely tied to the asset being funded in a particular financing request rather than to the total assets of the firm.

The Industry Canada (1994a) study and more recent research by Thompson, Lightstone and Company (1998) confirm that access to financing is more problematic for knowledge-based firms. The latter study provides tangible evidence of institutional debt levels experienced by knowledge-based SMEs compared to the general SME population. Findings indicate the median reported debt load of KBBs from financial institutions is below the SME norm, while the use of equity financing by KBBs is greater than for SMEs generally. The Thompson, Lightstone and Company (1998) study also sheds some light on the types of debt financing requested by SMEs, confirming that knowledge-based firms are much more likely to have requested operating capital as compared to term financing for other SMEs. Notwithstanding the perceived problems with access to debt financing, the Thompson, Lightstone and Company Ltd. study (1998) also reports that knowledge-based firms request higher amounts of financing on average and are marginally more likely to have their request approved.

In terms of access to government financing, the Thompson, Lightstone and Company Ltd. study (1998) was the only study identified in the literature review that dealt with knowledge-based firms. Empirical results from this research indicate that knowledge-based firms are more likely to make use of equity financing in the form of

government grants. As with the supply-side, the lack of theoretical and empirical research concerning government financing is a limitation to developing well-grounded research questions. Nonetheless, given the role of government funding agencies as outlined previously, one would expect demand-side differences when compared to chartered bank financing.

The following questions are intended to focus the present study on the financing experiences of knowledge-based firms in an attempt to further our understanding of the demand-side of institutional lending decisions.

**Q1** What roles have the chartered banks and government agencies played in financing knowledge-based firms and how do they differ from the roles played in financing less knowledge-intensive firms?

**Q2** What have been the experiences of KBBs with obtaining debt financing from chartered banks and government agencies and how do they compare to the experiences of less knowledge-intensive firms?

**Q3** What are the perceptions of KBBs with respect to chartered bank and government financing and how do they compare with the perceptions of less knowledge-intensive firms?

### **3.2 Areas of Investigation: The Supply-Side**

Notwithstanding the lack of a theoretical model to guide the present research, the literature review identified the following supply-side aspects of institutional lending

that are examined further in the present study: organizational framework, decision-making process, and loan evaluation. Each of these is considered from the perspective of chartered banks and government agencies to determine whether or not differences in approach exist between the two groups. Overall, the study also explores the existence of a “lending culture” within the chartered banks and government agencies and the extent to which the culture reflects the needs of knowledge-based firms. The remainder of this section is devoted to the discussion of the supply-side aspects of institutional lending and to the formulation of related research questions.

### **3.2.1 Organizational Framework**

The organizational framework includes the strategies, structures, systems, policies and procedures of the lending institutions. The literature review identified two banking studies that provide insights into aspects of the organizational framework that influence lending decisions. Wynant and Hatch (1991) found support for the role of the bank's organizational structure, commitment to small business, and the training and experience of account managers. Findings from their research confirm significant differences between the views of account managers and senior management of the attractiveness of small business clients, although it was not clear which had the greater impact on lending decisions. They also concluded that the skills and attitudes of account managers varied with experience and training and that the workload and tenure of account managers had an impact on risk assessment. Further, they concluded that collateral requirements varied with the account managers' lending experiences, risk-taking propensity, and knowledge of clients. These findings suggest potentially

important relationships between loan evaluation variables and organizational factors that should be examined in the present study.

McNamara and Bromiley (1997) argue for the influence of organizational factors, such as degree of formalization of decision processes, on risk assessment. They concluded that standardization of the loan review process appeared to increase the sensitivity of lenders to borrower risk. The authors further concluded that organizational effects resulted primarily from informal practices rather than formal organizational policies and procedures.

The impact of these organizational variables on lending to knowledge-based firms has not been previously tested empirically. Consequently, it is essential to determine whether or not loan evaluation and decision-making are affected by organizational frameworks, including strategies, structures, systems, policies and procedures. Although the chartered banks have established specialized lending units to address the needs of knowledge-based firms, it is not clear to what extent lending processes have been modified and how effective they have been. Presumably this approach is intended to enhance performance through improved skills and knowledge, suggesting that account managers in these specialized units should perceive less risk in knowledge-based firms than regular account managers. The present study investigates the impact of these organizational variables on loan evaluation and decision-making.

**Q4    Are loan evaluation and decision-making affected by organizational variables and are the effects different for knowledge-based firms compared to less knowledge-intensive firms?**

### 3.2.2 Decision-Making Process

4

Theoretical and empirical research in the commercial lending and venture capital areas argue for the importance of investigating decision-making processes. In the context of venture capital decisions, Boocock and Woods (1997) demonstrate that it is not possible to deal independently with the decision-making process and evaluation criteria. The interrelationships between the two are likely to be equally important in the context of commercial lending decisions. Also in the context of venture investing, Schilit and Chandran (1993) stress the importance of looking beyond rational decision-making approaches in which investors make decisions based on the risk/return profile, to incorporate the human aspects of decision-making.

A study of the effects of environmental uncertainty on personal lending undertaken by Leblebici and Salancik (1981) indicates the importance of the relationships between the banks' organizational structures and processes and the decision processes employed by account managers. The former is able to take account of uncertainty that can be anticipated, while the personal information acquisition strategies of loan managers is key to dealing with uncertainty associated with particular decisions. Unfortunately, the information acquisition strategies employed by commercial account managers have not been the subject of research. As a result, one is left to speculate as to its role in credit decision-making and its relative importance to lending to knowledge-based firms. Nonetheless, on the basis of the additional information asymmetry problems associated with lending to knowledge-based firms, it is reasonable to speculate that account managers may consult more widely and use a greater number of information sources when dealing with knowledge-based firms. Additional support for this suggestion is provided by research (Reitan and Waago,



1998) which demonstrates that bank officers report low levels of ability to evaluate criteria related to new technology-based firms.

**Q5** What are the information acquisition strategies employed by account managers to support credit decision-making and are there differences between the information acquisition strategies used by account managers in making lending decisions to knowledge-based businesses compared to less knowledge-intensive firms?

### **3.2.3 Loan Evaluation**

According to Hatch and Wynant (1986), loan evaluation consists of four components: borrower risk assessment; estimating borrower's needs; structuring a loan package; and loan management. Risk assessment is operationalized through the application of credit parameters generally referred to as the five "Cs" of credit, namely, capacity, capital, collateral, character and conditions. Capacity represents the extent to which the organization is able to meet its obligations and is usually reflected in the cash flows of the business. Capital refers to the equity of the business, or the investment of the entrepreneur, and provides a measure of the firm's ability to weather setbacks. Collateral refers to the assets (business and personal) that are available as security in the event of default. Character refers to the intent and commitment of the entrepreneur to repay the loan and includes her/his track record. Conditions is a catchall for a number of internal and environmental factors that may affect the borrower's ability to repay, including, but not limited to, the following: the proprietary nature of the product, competition, size of market, and industry climate and trends.

Wynant and Hatch (1991) suggest chartered banks focus primarily on risk assessment when lending to small firms and the Thompson, Lightstone and Company Ltd., study (1998) indicates cash flow and collateral are the dominant factors in determining the level of risk. In the context of the risk/return trade-off, potential return appears to be of secondary importance. Collateral is necessary but not sufficient to obtain financing. Risk ratings also reflect the credibility or character of the entrepreneur and industry structure or competitive conditions.

While these studies are helpful in identifying and explaining risk assessment properties associated with bank lending to small firms, the literature review revealed very little research directly related to knowledge-based firms. Studies by Riding and Swift (1993) and Philpott (1995) explore banking relationships in the context of one segment of the knowledge-based sector, technology-based ventures, with conflicting results. Philpott (1995) argues that high technology firms face significant information asymmetry problems resulting in the banks placing increased emphasis on collateral. Since the assets of these firms are largely intangible, the lack of collateral acts as a constraint to borrowing. Riding and Swift (1993), on the other hand, conclude turnaround rates do not differ significantly between high technology firms and those that place little emphasis on technology.

An important question for the present study concerns the extent to which financial institutions base lending decisions on the value of intangible assets, in particular human capital. While there appear to be a growing number of chartered banks acknowledging that intangible assets can be collateralized in the same way as physical assets, it is not clear whether this practice has been widely adopted by the banks. It is also not known whether the banks and other financial institutions take a similar view of all types of intangibles. As discussed in the literature review, a number

of researchers (Brooking and Motta, 1996; Edvinsson and Sullivan, 1996; Stewart, 1997) have proposed intellectual capital taxonomies comprised of human capital, structural capital, customer capital, and intellectual property. In light of the lack of research on knowledge-based firms and the questions concerning the role of intellectual capital in lending decisions, it is reasonable to ask if risk assessment differs in the context of knowledge-based firms and if financial institutions incorporate intellectual capital valuation into the risk assessment process?

The second stage of loan evaluation consists of determining financing needs and of assessing the sensitivity of the requirements to uncertainties identified in the risk assessment. The literature review did not reveal any research dealing specifically with this second stage. Nonetheless, the relationship between determining financing needs and uncertainty is open to empirical investigation and will be considered in the present study to determine whether or not differences exist between loan evaluation approaches used by chartered banks for KBBs and those used for more traditional firms.

The third stage of loan evaluation involves structuring the terms of the loan, including the amount, the interest rate, the repayment terms, the collateral required, and the conditions imposed on the business. In sum, the terms of the loan allow the lending institution to modify the risks in order to achieve the appropriate risk/return profile. As with risk assessment, the literature review revealed limited research related to these factors in the context of small firms, and even less related to knowledge-based firms.

Research related to loan structuring deals primarily with interest rates, collateral and loan covenants. Apilado and Millington (1992) investigate the role of interest rate adjustments and loan covenants in lending to small businesses. Results demonstrate that small firms incur substantially higher interest rates, in addition to more covenants. Fabowale, Riding and Swift (1991) also examine factors influencing the terms of bank

credit. Results of this research indicate that rates on loans to small businesses are primarily determined by a single dimension X capacity. This finding suggests potentially important relationships between risk assessment variables and loan structuring variables.

As indicated previously, research by Riding and Swift (1993), comparing banking experiences of high technology firms to those that place little emphasis on technology, concludes that interest rates do not differ significantly between the two categories of firms. In the context of knowledge-based firms, it is likely that, as argued *by credit rationing theory, banks limit credit or use collateral rather than increase rates.* Since the assets of knowledge-based firms are primarily intangible, banks may resort to using personal guarantees. Similarly, since covenants are used by banks to address agency problems and to mitigate risks (Apilado and Millington, 1992), knowledge-based firms may be subject to increased use of loan covenants. Based on the research findings discussed here, it is reasonable to assume that there may be differences between the loan terms and conditions placed on knowledge-based firms and those placed on less knowledge-intensive businesses. As a result, it is necessary to determine if differences exist and why?

The fourth stage of loan evaluation is loan management, which consists of the monitoring processes that the banks employ to manage their risk exposure. Such monitoring focuses on the key risks and uncertainties, identified in the risk assessment stage, and goes hand-in-hand with the loan covenants and conditions. As with determining borrowers' needs, the literature review did not reveal any research dealing specifically with loan monitoring. It appeared, at least in some cases, that loan management may have been subsumed under covenants and conditions. In any event,

it is necessary to examine monitoring processes to determine if loan management differs for knowledge-based firms.

Based on the previous discussion of loan evaluation and related issues, the following research questions are proposed:

- Q6 Does risk assessment of knowledge-based firms differ from risk assessment of less knowledge-intensive firms and, if so, how?**
- Q7 Do chartered banks attach different terms and conditions to loans made to knowledge-based businesses than to those made to less knowledge-intensive firms and are there differences between the loan monitoring processes employed for knowledge-based firms and those used for less knowledge-intensive businesses?**

#### **3.2.4 Government Financing**

As indicated previously, the literature review did not reveal any relevant research dealing with lending from the perspective of government agencies. This lack of theoretical and empirical research is a significant limitation to developing research questions with respect to loan evaluation, institutional structures and decision-making processes. For instance, unlike the chartered banks, it is not clear whether or not various government agencies have developed and implemented structures and approaches specifically designed to address the needs of knowledge-based firms. Nonetheless, given that the role of most government funding agencies is to fill financing gaps, to leverage funds from other sources, and on occasion to act as a lender

of last resort, one would expect differences in lending approaches and lending decisions compared to chartered banks. As a result, it is important to determine if differences exist, in what areas, and why. The following question is intended to focus the present research on the comparison between chartered bank lending and government financing:

**Q8 Are there differences between lending decisions of chartered banks and lending decisions of government agencies? If differences exist, to what extent can they be explained by differences in institutional structures, loan evaluation and decision-making processes?**

### **3.2.5 Lending Culture**

The previous discussion of the supply-side dealt with the primary theoretical components of institutional lending. At a broader level, it is reasonable to consider whether or not a “lending culture” exists among the members of the community of commercial lenders and account managers and whether or not that culture supports access to debt financing by the emerging knowledge-based sector. It is also important to explore the extent to which various groups of account managers share a common lending culture. Measuring the pervasiveness of shared culture among various groups of account managers also should support investigation into other dimensions of institutional lending. To that end, the present study addresses the following additional research questions:

**Q9 Does a common or shared lending culture exist among account managers in chartered banks and government agencies?**

**Q10 To what extent does the lending culture within chartered banks and government agencies reflect the needs of KBBs?**

### **3.3 Proposed Research Framework**

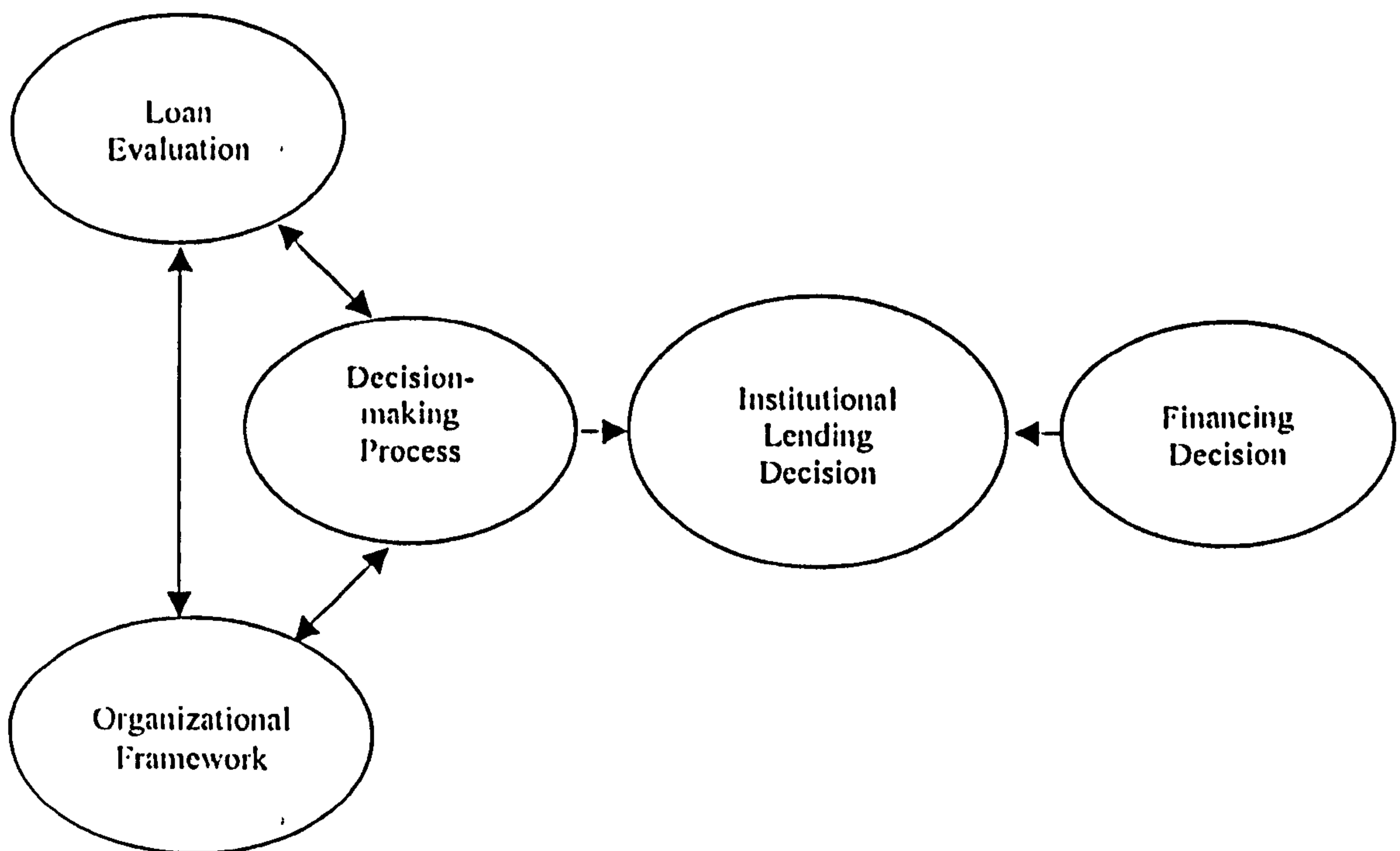
Based on the previous discussion, it appears that institutional lending, much the same as venture capital investing (Hall and Hofer, 1993; Mason and Harrison, 1996b), is a multi-dimensional process, involving multi-stages, multi-criteria and multi-persons. Further, the literature review highlighted the importance of the interrelationships within and among the various components of the lending process. As a result, in order to comprehend institutional lending decisions fully, the research approach must capture the integrative nature of the lending process. To that end, the present study uses a framework that integrates loan evaluation processes, organizational frameworks, and decision-making processes of lending institutions, and the debt financing experiences of entrepreneurs (Figure 3.1).

The lending model developed by Hatch and Wynant (1986) and the decision criteria based on the “5Cs” combine to form the basis for loan evaluation in the present study. The proposed framework recognizes that loan evaluation does not occur in isolation. Account managers operate within an institutional framework comprised of formal and informal structures, systems, policies and procedures (McNamara and Bromiley, 1997). As indicated by Fletcher (1995a and 1995b), decision-making likely involves a process of interaction between the account managers' experiences and the banks' rules and guidelines. Further, credit decision-making also comprises the information acquisition strategies of account managers, including contacts and information sources used. Finally, this approach also includes a demand-side

perspective on lending decisions, formulated from the debt financing experiences of knowledge-based SMEs.

In summary, institutional debt financing to knowledge-based firms emerges from the interaction of the process of loan evaluation, credit decision-making and institutional structures on the supply-side, and financing decisions of entrepreneurs on the demand-side. The exploratory framework and research questions proposed here should facilitate investigation of lending to knowledge-based firms and of the extent to which a lending culture is emerging among chartered banks and government agencies that reflects the needs of KBBs.

**Figure 3.1**  
**Institutional Lending Framework**





## CHAPTER 4

### RESEARCH METHODOLOGY

#### 4.0 Research Objective

The primary goal of basic scientific inquiry is to provide an *understanding* of the phenomena under consideration. Theories are the basis of such understanding in that they are explanations for how and why particular phenomena occur and for how they are related to other phenomena (Greenberg *et al.*, 1988; 566).

The present research is exploratory and was undertaken to increase our understanding of chartered bank lending and government financing in the knowledge-based economy. The study examines lending to knowledge-based firms from both a demand-side and a supply-side perspective. On the demand-side, the research examines the financing experiences of entrepreneurs in SMEs to address the following questions:

- Q1 What roles have the chartered banks and government agencies played in financing knowledge-based firms and how do they differ from the roles played in financing less knowledge-intensive firms?
- Q2 What have been the experiences of KBBs with obtaining debt financing from chartered banks and government agencies and how do they compare to the experiences of less knowledge-intensive firms?
- Q3 What are the perceptions of KBBs with respect to chartered bank and government financing and how do they compare with the perceptions of less knowledge-intensive firms?

From the supply-side, the study examines the lending processes and lending decisions of chartered banks and government agencies to address the following research questions:

- Q4** Are loan evaluation and decision-making affected by organizational variables and are the effects different for knowledge-based firms compared to less knowledge-intensive firms?
- Q5** What are the information acquisition strategies employed by account managers to support credit decision-making and are there differences between the information acquisition strategies used by account managers in making lending decisions to knowledge-based businesses compared to less knowledge-intensive firms?
- Q6** Does risk assessment of knowledge-based firms differ from risk assessment of less knowledge-intensive firms and, if so, how?
- Q7** Do chartered banks attach different terms and conditions to loans made to knowledge-based businesses than to those made to less knowledge-intensive firms and are there differences between the loan monitoring processes employed for knowledge-based firms and those used for less knowledge-intensive businesses?
- Q8** Are there differences between lending decisions of chartered banks and lending decisions of government agencies? If differences exist, to what extent can they be explained by differences in institutional structures, loan evaluation and decision-making processes?
- Q9** Does a common or shared lending culture exist among account managers in chartered banks and government agencies?

Q10 To what extent does the lending culture within chartered banks and government agencies reflect the needs of KBBs?

The demand and supply-side components are closely related and the study of both is critical to enhancing our overall understanding of lending to knowledge-based firms.

#### 4.1 Research Design and Methods

There is no way to convert research questions into useful methods decisions; your methods are the *means* to answering your research questions, not a logical transformation of the latter. Their selection depends not only on your research questions, but on the actual research situation and what will work most effectively in that situation to give you the data you need (Maxwell, 1998; 88).

Research design "is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure" (Selltiz *et al.*, 1976; 90). According to the authors, the major emphases of exploratory studies are on discovering ideas and on gaining insights. As a result, the design must be sufficiently flexible to permit consideration of various aspects of a phenomenon. At the same time, the study requires a design that minimizes potential for bias in the collection of data and maximizes the reliability of the data collected. This exploratory study employs a mixture of quantitative and qualitative research methods to provide an understanding of the phenomena under consideration and of the context within which participants act and the processes by which actions take place (Maxwell, 1998).

To achieve the research objectives of the present study and to address the research questions, it was necessary to collect information from three key sources, namely entrepreneurs, senior officials in the chartered banks and government agencies,

and account managers in lending institutions. Input from entrepreneurs was required to determine financing experiences and to compare those of high knowledge firms to those in less knowledge-intensive businesses. Senior banking and government officials provided the context for overall institutional policy and commitment to the SME sector, including knowledge-based firms. Finally, account managers served as the primary data source for examining credit decision-making processes and for determining criteria used to evaluate lending applications. The methodology that follows is based on this triangulation of data sources (Denzin, 1978).

Given the exploratory nature of this research and given resource constraints, it was decided to limit the study to knowledge-based firms and lending agencies located in the province of Newfoundland and Labrador. The following discussion of research methods used in this study is presented according to the two primary study components: the demand-side perspectives of entrepreneurs, and the supply-side perspectives of lending institutions.

#### **4.2 Methods Used in the Demand-Side Study of Entrepreneurs**

As indicated previously, one of the objectives of the present research study is to investigate the experiences of entrepreneurs in knowledge-based firms who have sought financing from chartered banks and government agencies. To fully achieve this objective it is necessary to obtain data from entrepreneurs in high knowledge firms and from those in less knowledge-intensive businesses. This will enable a comparison between the two groups, as well as a comparison between entrepreneurs' experiences with bank financing and their experiences with access to government financing.

#### 4.2.1 Data Collection

A mail survey offers the advantage of surveying large numbers of geographically diverse respondents (Mangione, 1998). As Mangione suggests, a mail survey is relatively inexpensive and allows respondents the time necessary to look up more detailed information. Further, respondents are afforded privacy and convenience in responding, and are able to see the context of a series of questions. Mail surveys are ideally suited to situations where human resources to conduct research are limited, where respondents have a stake in the topic, where the number of research objectives is limited, and where the vast majority of questions can be framed in a closed-ended style (Mangione, 1998). On this basis, a mail survey was the most appropriate means of collecting data from entrepreneurs.

**The Survey Sample.** The mailing list for the survey consists of a database obtained from the provincial Department of Industry, Trade and Technology (DITT), supplemented with additional contacts provided by the Department of Development and Rural Renewal (DDRR), the Canadian Centre for Marine Communications (CCMC) and the Atlantic Canada Opportunities Agency (ACOA). The DITT database is comprised of firms in the following sectors: manufacturing, biotechnology, aquaculture, environmental, petroleum, mining, engineering consulting, and information technology. Sectors underrepresented in this database include retail, personal services, publishing, crafts, tourism, education, health care, and other professional services. While the database is not representative of all firms in the Province, it was chosen to ensure a mix of knowledge-based firms. Supplementary contacts included firms in the tourism, education, publishing, and professional services

sectors. The modified database, considered a purposeful sample (Patton, 1990), consists of 1715 private sector firms located in Newfoundland and Labrador. Purposeful sampling may be used to ensure heterogeneity in the population, to include cases that are critical for developing theory, and to examine differences between individuals or settings (Maxwell, 1998). As such, purposeful sampling is well suited to the survey of entrepreneurs.

**Design and Administration of the Survey.** The first part of the survey (Appendix 4.1) was designed to collect basic demographic data on the firms (for example, type of business, Standard Industrial Classification (SIC) code, age, ownership structure, location, number of employees, gross sales or revenues, research and development expenditures, and educational level of employees) and on the owners/managers (for example, gender, age, education, and years of experience). To determine the degree of knowledge-intensity of each firm, two additional questions were included in the background section. The first asked respondents to rate the importance of a number of factors to success in their industry, while the second asked respondents to indicate the extent to which these factors apply to their firm. The factors included in these two questions were adapted primarily from the work of Lee and Has (1996). This area is discussed further in the next section on data analysis.

The second part of the survey was designed to explore issues related to experiences accessing bank and government financing. Two previous studies (Wynant and Hatch, 1991; Thompson Lightstone and Company Ltd., 1998) provided the basis for the issues to be addressed in part two of the survey related to experiences with obtaining financing from chartered banks. More specifically, the issues concern the timing, nature and outcome of their first attempt to access bank financing and

entrepreneurs' perceptions of the importance of various factors to the banks in making a decision on the application for financing. Respondents were asked the same questions regarding their first attempts to obtain financing from government departments and agencies. This facilitated comparison between access to chartered bank financing and access to government financing.

The survey was pre-tested on a sample of seven firms chosen in consultation with members of the Provincial Government Sectoral Team on Knowledge-Based Services Exporting. Appendix 4.2 is a copy of the protocol used to elicit feedback during the pre-test.

The surveys with personalized cover letters on Memorial University of Newfoundland letterhead (Appendix 4.3) and postage paid return envelopes were sent by first class mail during February of 1999. Respondents were offered summary results as an enticement to complete the survey. Surveys were coded to permit tracking. Follow-up letters (Appendix 4.4) were sent after three and six weeks.

Survey responses were compared to Statistics Canada data on the population of firms in the Province to determine representativeness of respondents.

#### **4.2.2 Data Analysis and Interpretation**

"While not all social science research entails the use of formal measurement instruments, it is always necessary to specify how the central concepts are being applied to concrete social phenomena" (Clark and Causer, 1991; 169).

In the present research project, this implies specifying measures of knowledge-intensity to determine whether or not a firm is considered to be knowledge-based. KBB categorization is necessary to facilitate analysis of survey data. Unfortunately, as

indicated in Chapter 1, there is no generally accepted definition of a knowledge-based industry (KBI) or knowledge-based firm and there are no generally accepted empirical measures of associated theoretical concepts (Howitt, 1996). The lack of empirical measures necessitates multiple approaches to operationalizing the knowledge-intensity construct (Webb *et al.*, 1981). The present study uses standard industry classification data and a number of additional measures compiled from data collected from SMEs in order to classify firms by level of knowledge-intensity. In cases where SIC codes were not available from the survey, descriptive information on the primary type of business, provided by respondents, was used to identify SICs.

The SIC information used in the present study to categorize firms by level of knowledge-intensity is based primarily on work by Lee and Has (1996). The objective of their research was to identify knowledge-producing industries. Utilizing research and development and human capital indicators to measure knowledge-intensity and to define knowledge-intensive industries, Lee and Has categorized 55 SICs as high, medium or low knowledge-intensity. The present study also utilizes input from entrepreneurs. Two survey questions (Appendix 4.1, questions 16 and 17) elicited input from respondents on the importance of a number of factors to success in their industry and on the extent to which these factors apply to their firm. These factors were also drawn primarily from the work of Lee and Has (1996).

Initially, factor analysis was employed with the items included in these two questions. "Factor analysis is used to discover patterns among the variations in values of several variables" (Babbie, 1992; 444). On the basis of the results of the factor analysis, new variables were created. Subsequently, discriminant analysis was employed to test the effectiveness of these new predictor variables at classifying firms by level of knowledge-intensity. A process of random selection was used to select



approximately half of the cases for the analysis phase with the remainder being used for the classification phase. Further, analysis of variance was used to determine whether or not significant differences existed among the three categories of knowledge-based firms for each of the variables. Post hoc tests were used to check for significant differences between the three groups.

Given the primary purpose of the survey was to compare financing experiences of knowledge-based firms to more traditional businesses, descriptive statistics, crosstabulations and comparison of means were the main methods used to analyze the remainder of the survey data. Responses to open-ended questions were analyzed using a more qualitative approach to data analysis (Miles and Huberman, 1994).

#### **4.3 Methods Used in the Supply-Side Study of Lending Institutions**

The study is also designed to examine the supply-side of institutional lending decisions, including organizational frameworks, loan evaluation, and decision-making processes. The supply-side perspectives are important to understanding the lending and risk assessment processes of chartered banks and government agencies and to examining approaches used when lending to KBBs compared to more traditional businesses. The study employs the lending framework, outlined previously in Figure 3.1, to examine the three primary components of institutional lending decisions: organizational framework, loan evaluation and decision-making process. The supply-side components of this framework, including the specific dimensions to be examined in this study are reproduced in Figure 4.1. Before discussing each of these components, a brief overview of the methodology employed for the supply-side is provided.

**Figure 4.1**

**Supply-Side Components of Institutional Lending**



At the first stage, interviews were conducted with senior managers in each of the 10 participating organizations (four government agencies and six chartered banks). These interviews focused primarily on organizational frameworks in relation to knowledge-based businesses. A copy of the interview protocol is included in Appendix 4.5. At the second stage, account managers were presented with business proposals for review (Appendix 4.6). Simultaneous verbal protocols were employed to document initial perceptions, questions and reactions to the proposals. Following completion of this initial review, account managers were interviewed to obtain feedback on specific aspects of the proposals. A copy of the protocol used for the business plan experiments

and interviews is included in Appendix 4.7. At the next stage, as part of their due diligence process, account managers were asked to identify additional information requirements. Finally, following completion of the full due diligence process, account managers were interviewed to determine lending decisions, to identify concerns with the proposals, to examine decision-making processes, and to obtain post hoc ratings of the proposals. A copy of the interview protocol used at the post review stage is included in Appendix 4.8. Each of these stages is described in more detail in the following sections on establishing organizational frameworks and examining loan evaluation and decision-making processes.

#### **4.3.1 Establishing Organizational Frameworks**

As indicated previously, it is necessary to obtain input from senior banking and government officials to provide the context for overall institutional policy and commitment to the SME sector, including knowledge-based firms. While previous research in this area is limited, there is evidence that organizational factors, such as structures and processes, influence lending decisions (McNamara and Bromiley, 1997; Leblebici and Salancik, 1981). In order to examine the extent to which account managers are affected by organizational variables, it is necessary to establish the existing framework, policies and procedures of each lending institution. In addition, contact with senior officials is necessary to secure co-operation and to obtain formal permission to interview account managers for the final stage of data collection required to examine lending processes and to determine lending criteria.

Wynant and Hatch (1991) provided insight into the organizational structures and broad lending policies employed by Canadian chartered banks in servicing the

SME sector. More specifically, their research investigated bank objectives and organizational strategies and structures for the small business market, decision-making processes for small business loans, and the training and experience of small business bankers. No similar studies have been undertaken on the banks' or governments' approaches to servicing the knowledge-based sector. More recently, Thompson Lightstone and Company (1998) focused almost exclusively on the perspectives of account managers and SMEs, while incorporating limited demand-side perspectives from special interest groups, such as knowledge-based firms. As a result, there is a need to establish the organizational context within which lending decisions to knowledge-based firms are made.

The present study focuses on lending institutions (chartered banks and government agencies) in Newfoundland and Labrador. Six Canadian banks and four government agencies represent the primary sources of debt financing to SMEs in the Province. All the banks, with the exception of HSBC, have established specialized lending centres to deal specifically with knowledge-based SMEs. However, none of these centres are located in the Province.

#### **4.3.1.1 Data Collection**

Interviews with senior managers and with account managers (those who reviewed the knowledge-based business proposal), as well as secondary sources, including promotional literature and websites provide the data necessary to establish organizational frameworks.

Previous contact with senior individuals in chartered banks and government agencies confirmed their reluctance and, in some cases, outright refusal to provide

access to policies and procedures manuals, to lending data, and to client files. As a result, qualitative interviews were used to obtain information on institutional structures, decision processes, and policies and procedures. According to Weiss (1994), there are a number of general research objectives for which qualitative interviews are appropriate, including developing descriptions, integrating perspectives, describing processes and understanding interpretations. As such, the qualitative interview was well suited to obtaining the information needed to determine overall institutional policy and commitment to the SME sector and to knowledge-based firms.

In the case of the chartered banks (Bank of Montreal, Canadian Imperial Bank of Commerce, HSBC Bank, Royal Bank of Canada, Scotiabank and Toronto Dominion Bank), interviews were conducted with the senior manager responsible for each bank in the Province. In the case of the government agencies, interviews were conducted with the assistant deputy ministers of the two provincial government departments (DIT and DRR) and with the appropriate senior officials in the two federal agencies (ACOA and BDC). The pre-test of the protocol consisted of the initial interviews with senior officials in the chartered banks and government agencies and resulted in only minor modifications to the protocol. Seven of the interviews were conducted in-person, one was conducted by telephone and two individuals submitted written responses to the survey questions and subsequently were followed up by telephone. Three of the respondents from the chartered banks were located outside the Province. All in-person interviews were audiotaped and verbatim transcripts generated for subsequent review and interpretation. Except as noted above, no background information was collected on senior management interviewees.

The interview protocol explored the following areas and related issues: bank and government agency objectives in relation to SMEs, especially knowledge-based

small firms; organizational strategies and structures designed to serve the SME market, especially knowledge-based firms; policies and procedures, and decision-making processes for small business lending, particularly lending to knowledge-based SMEs; and specialized training, expertise and support provided to account managers dealing with SMEs, especially those in knowledge-based sectors.

Further, 12 account managers in the participating organizations were interviewed about the structure, processes and systems employed by their organizations to deal with KBBs. The questions addressing KBB structure and support were essentially the same as those explored with the senior management group. A copy of the interview protocol is included in Appendix 4.8. These interviews are discussed further in section 4.3.2.1 since they also address loan evaluation and decision-making processes. Background information, comprised of years of lending experience, educational background, and industry sector specialization, was collected from all account managers.

Supplementary materials, including brochures, websites and in one case, a CD ROM, related to each organization's approach to the KBB sector also were reviewed where available.

#### **4.3.1.2 Data Analysis and Interpretation**

As indicated previously, interviews with senior managers in the banks and government agencies were audiotaped. Verbatim transcripts of these interviews, as well as the interviewer's notes, were content analyzed to determine organizational strategies and organizational structures associated with the KBB sector. This analysis was supplemented by content analysis of interview data obtained from the account

managers and of published secondary data, comprised primarily of information obtained from institutional brochures and websites. Overall, analyses focused on developing descriptions of organizational approaches to serving the KBB market and on comparing the approaches taken by chartered banks to those employed by government agencies.

Additional data obtained from account managers, consisting of years of lending experience, educational background, and industry sector specialization, were also subjected to crosstabulations and comparison of means to identify differences between account managers in banks and government agencies, and between KBB lending specialists and account managers serving more traditional sectors.

#### **4.3.2 Examining Loan Evaluation and Decision-Making Processes**

Account managers in chartered banks and government agencies served as the primary data source for examining lending decisions. A total of 23 account managers, 13 in banks and 10 in government agencies, participated in the study. Elements of the lending decision that were investigated included both process and content. In terms of the credit decision-making process, the research project encompassed all stages of credit evaluation. Although the focus of the study was on loan evaluation and risk assessment, including the information acquisition and decision strategies of account managers, interrelationships among the various stages were considered. In terms of content, the study examined risk assessment criteria used to evaluate lending applications.

#### 4.3.2.1 Data Collection

Loan evaluation data were derived primarily from verbal protocols and interviews with account managers, supported by data obtained from interviews with senior management. Decision-making processes are based primarily on data obtained from interviews with account managers, also supported by data obtained from interviews with senior officials.

The literature review raised a number of issues that were addressed when selecting methodologies for data collection in this area. First, in the venture capital context, evaluation is a multi-dimensional process, involving multi-stages, multi-criteria and multi-persons (Hall and Hofer, 1993). The lending process and credit decision-making areas appear to be similar to venture investing in this regard (Reitan and Waagø, 1998). As a result, it was necessary to examine processes not just decisions (Sandberg, Schweiger and Hofer, 1988) and to utilize a process model or decision-making framework to investigate factors at different stages of the lending process (Bruno and Tyebjee, 1984; Boocock and Woods, 1997; Reitan and Waagø, 1998). Second, to understand the lending process and lending criteria, it was necessary to examine both within an appropriate context (Leblebici and Salancik, 1981; Fletcher, 1995a and 1995b; McNamara and Bromiley, 1997). Actual lending situations and actual lending decisions would be ideal but unrealistic given concerns for confidentiality. Third, the decision-making process and evaluative criteria are likely interrelated and need to be examined simultaneously rather than independently (Boocock and Woods, 1997). Fourth, there are significant limitations associated with self-report data on the importance of lending criteria, such that self-report data should



not be used exclusively (Shepherd, 1997 and Zacharakis and Myer, 1998). Fifth, there are a large number of interrelated variables that appear to influence lending decisions.

It is evident from the previous discussion that, to fully understand the lending process and lending criteria, it was highly desirable to observe decision-making under actual conditions. Examining lending decisions in a realistic context increases reliability and provides details of the processes and criteria that could not be obtained otherwise. Such an approach also addresses the concern that the decision-making process and evaluation criteria should not be dealt with independently and the concerns associated with post hoc self-report data, whether obtained through interview or survey. However, since neither the banks nor government agencies would permit observation of actual cases, an alternate approach had to be developed. To that end, two business plans were developed specifically for the purpose of this research, one for a knowledge-based business (TeleCare Incorporated)<sup>1</sup> and one for a more traditional venture (Glacier Ice Incorporated)<sup>2</sup>. Copies of the two proposals are included in Appendix 4.6.

To control for issues related to historical data and previous dealings with financial institutions, the business proposals focused on start-up situations involving hypothetical entrepreneurs. The plans were designed to reflect contrast in a number of key dimensions of knowledge-intensity, especially in the area of human capital. Funding requirements for the two ventures consisted of term financing at start-up of \$200,000 with additional term financing of \$100,000 in each of the second and third years of operation, and operating credit requirements of \$1,000,000-\$1,250,000. The plans were reviewed by four faculty members at Memorial University of

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<sup>1</sup> TeleCare Incorporated is a telemedicine-based medical service venture that proposes to offer medical diagnosis, consultation and monitoring of patients with cardiovascular disease at a distance.

<sup>2</sup> Glacier Ice Incorporated is a resource-based harvesting and manufacturing venture that proposes to harvest and process glacier ice to produce specialty products, such as ice blocks, cubes and crushed ice for ultimate sale to industrial, institutional and retail consumers.

Newfoundland teaching in the area of entrepreneurship and new venture creation.

Three of these individuals had previous experience in the commercial lending area with chartered banks and one is a chartered accountant with considerable small business consulting experience. In addition, the two proposals and associated protocols were piloted in three organizations, one bank and two government agencies.

In discussing the lack of understanding of the processes involved in human problem solving and decision making, Payne, Braunstein and Carroll (1978) concluded the following:

Part of the reason for this lack of understanding is that most decision researchers have used empirical procedures which are not suited to the identification of the processes which lead a decision maker to a particular judgement. Typically, research has been focused on data which reflect only the end product of the decision processes, for example, choice proportions, rankings or ratings (p. 17).

To provide insight into the decision-making process and to ensure the situation was as near as possible to actual lending conditions, observational methods were employed in the present study (Selltiz *et al.*, 1976). Cook and Diamond (1976) have provided evidence of the external validity of results obtained from field research. The present methodology utilized simultaneous verbal protocols (Newell, Shaw and Simon, 1958) and qualitative interviews in a two-stage approach to examine loan evaluation and decision-making by account managers.

Verbal protocols involve participants "thinking aloud" while they perform a task, in this case the review of a business proposal. Ericsson and Simon (1994) outline eight conditions under which verbal protocols are useful and provide accurate data:

1. the information reported is the focus of study;
2. the task is not of a highly routine nature;
3. a short time exists between the task and recording;
4. excessive encoding of information is not required;

5. the reports are oral;
6. subjects are free of distraction;
7. clear instructions are provided on how to verbalize; and
8. the reports are as complete as possible.

These conditions are well satisfied in the present study and provide support for using verbal protocols.

Building on the seminal work of Newell, Shaw and Simon (1958), numerous researchers have utilized the simultaneous verbal protocol to examine decision-making processes and problem solving in diverse areas (Schweiger, 1983) and to overcome the problems outlined by Payne *et al.* (1978). Schweiger (1983) and others (Ericsson and Simon, 1980) have also addressed the issue of the obtrusive nature of the simultaneous verbal protocol and concluded that "... it appears improbable that there were any effects in performance due to the use of simultaneous verbal protocols" (Schweiger, 1983; 189).

At the first stage of the data collection process, bound copies of the proposals were submitted to account managers for review. The account managers were selected by the senior commercial credit person in the case of the chartered banks and by the departmental director or manager in the case of the government agencies. Each account manager reviewed one proposal. The account managers were provided with only limited advance information on the proposals, including the nature of the venture and the magnitude of the funding requirements.

At the initial review stage, verbal protocols were used to capture the perceptions, opinions, comments, questions and concerns expressed by account managers. Warm-up procedures, adapted from Ericsson and Simon (1993), were used to familiarize the subjects with the think aloud technique and to stress the distinction

between concurrent verbalization of thoughts and retrospective reporting. The verbalized thoughts were recorded by audiotape for later transcription and analysis. The researcher was present<sup>3</sup> during the review and made notes of comments and reactions but did not intervene in the process.

Prior to reviewing the proposal, each participant was asked to outline the review process normally followed. Immediately following the initial review each account manager was asked to indicate to what extent the review process paralleled his/her usual review and to rate the proposal in 13 areas. These factors were adapted from previous studies on bank lending and venture capital investing in Canada (Wynant and Hatch, 1991; Knight, 1986 and 1994; Thompson Lightstone, 1998). A copy of the protocol used for the business plan experiment is included in Appendix 4.7.

At the second stage in the process, which involved conducting their due diligence, account managers were asked to identify additional information requirements. This information was transmitted to the researcher by mail, fax, phone, e-mail and in some cases, in-person.

Finally, at the third stage (post review), which followed the completion of the risk assessment process, account managers were interviewed to determine the nature and extent of recommended support, to identify concerns with the proposals, and to investigate the decision-making processes employed. At this stage, account managers were again asked to rate the business proposal on the same 13 dimensions outlined previously. A copy of the interview protocol used at the post review stage is included in Appendix 4.8.

This interview was semi-structured, thereby permitting more intensive study of perceptions, attitudes and motivations than a standardized interview (Selltiz *et al.*,

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<sup>3</sup> Four of the reviews were conducted by telephone.

1976). Comparing the qualitative interview to participant observation, Jones (1996) suggests that the goal of the interview "... is to develop an understanding of the social and psychological processes that have occurred in a particular setting, or among people who have had particular sets of experiences — but not by immersing yourself in the setting and observing. Rather, the goal is achieved by interviewing people who have been in the setting of interest, or who have had the experiences you want to focus on" (p.140).

#### **4.3.2.2 Data Analysis and Interpretation**

Interpretation of the interview data and analysis of the business plan reviews necessitate using a combination of qualitative and quantitative methods of data analysis. As Strauss and Corbin (1998) argue, the interplay between the two is important to work aimed at theory building. As the authors point out, in qualitative research studies such as this, "... data collection and analysis occur in alternating sequences. Analysis begins with the first interview and observation, followed by more analysis, more interviews or fieldwork, and so on. It is the analysis that drives the data collection" (Strauss and Corbin, 1998; 42).

The observational nature of the simultaneous verbal protocol approach combined with the qualitative nature of the interviews with both senior management and account managers require using a highly qualitative and in some cases, primarily descriptive or narrative approach to analysis and interpretation (Caulkins, 1988). Some of the qualitative data from the business plan reviews was interpreted in a similar fashion. However, other data obtained from the business plan reviews, especially the two-stage ratings of the venture proposals, were analyzed using more quantitative

approaches including consensus analysis (CA), multidimensional scaling (MDS) and hierarchical clustering (HIC), in addition to standard multivariate techniques. Data analysis includes comparisons of results between the following a priori groups of account managers: account manager type (government and bank), type of plan reviewed (traditional and KBB), and account manager focus (generalist and KBB).

Given its prominence in the analysis of the results of the business plan reviews, an overview of consensus analysis follows. CA has its roots in cognitive anthropology where it was originally developed as a technique for determining which respondents are most knowledgeable and reliable in a particular cultural context (Caulkins and Hyatt, 1999). The theory was motivated by the fact that when exploring new cultures and asking questions of individuals, neither the correctness of answers to the questions nor the cultural competence of the respondents is known (Romney *et al.*, 1987). As a theory, CA is based on the assumption that there is one culture that is the same for all members of a group and that members of the group possess varying degrees of knowledge with respect to a particular subject (Romney, Weller and Batchelder, 1986). CA also specifies the conditions under which more agreement among individuals on correct answers to questions indicates more knowledge on their part (Borgatti, 1996b). There are three assumptions underlying the methodology of consensus analysis.

“Translated into the anthropological context, they are as follows:

1. One Culture. It is assumed that, whatever cultural reality might be, it is the same for everyone. There are no subcultures that have systematically different views on a given topic. All variability is due to variations in amount of knowledge.
2. Independence. The only force drawing people to a given answer is the culturally correct answer. When informants do not know an answer, they choose or make up one independently of each other. ....

3. One Domain. All questions are drawn from the same underlying domain<sup>4</sup>....”  
(Borgatti, 1996b; 45).

The consensus model makes no presumptions as to what constitutes a correct answer. The theory uses consensus among respondents to ascertain the “culturally correct”<sup>5</sup> responses and subsequently infers the level of knowledge of each informant on the basis of the relationship to the shared culture. As a method, CA is useful in determining patterns of agreement among respondents concerning a particular domain, what information is culturally correct within the group, and how well informed each individual is with respect to the domain of knowledge (Caulkins and Hyatt, 1999). According to Romney, Weller and Batchelder (1986), one of the main advantages of CA is the ability to produce reliable results with as few as four respondents.

According to Caulkins and Hyatt (1999), consensus analysis should not be limited to the study of high-agreement domains. The authors propose a typology for conceptualizing and examining diversity in non-coherent or low-consensus domains consisting of the following: weak agreement domains, turbulent domains and multicentric domains. The latter is comprised of two subcategories: subcultural domains where there are two or more groups expressing different but not opposite views, and contested domains where groups take opposing perspectives. A weak agreement domain is characterized by an elbow-bend scree plot of eigenvalues and no negative knowledge scores. Turbulent domains are characterized by a straight-line descending scree plot of eigenvalues and, also, no negative knowledge scores. Subcultural groups are distinguished by the appearance of two or more “answer keys”.

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<sup>4</sup> Domain in this context refers to a body of knowledge on a particular topic or subject. In consensus analysis, all questions must be drawn from a single domain.

<sup>5</sup> According to Borgatti (1996b), the right answer to a question in this context is a culturally defined concept and does not imply truth in the scientific sense of empirical reality.

while the opposing views of contested groups are represented by negative knowledge scores.

In so far as a “culture of lending” may exist among account managers in lending institutions, consensus analysis is utilized in this study as a means of exploring the existence, nature and pervasiveness of this culture.

Consensus analysis performed on initial and post review data is also supported by factor analysis and correlation analysis. Factor analysis is employed to gain additional insight into key lending variables and the extent to which there is convergence among the variables over time. Correlations are computed between initial and post review ratings to investigate the impact of the due diligence process on account managers’ perceptions and, therefore on overall risk assessment and loan evaluation.

Finally, information requirements identified by account managers and data concerning internal and external resources utilized by account managers are analyzed to provide further insight into loan evaluation and decision-making. Descriptive statistics and comparison of means are employed to determine if differences exist among the three a priori groups of account managers.

#### **4.4 Conclusion**

The methodology as outlined is well suited to the needs of this study for a number of reasons. In terms of the demand-side, the mail survey provides the opportunity to obtain input from a geographically diverse group of entrepreneurs. This is important for budgetary reasons. More importantly, the mail survey also affords



privacy and convenience for respondents, as well as the time and flexibility needed to reflect on previous experiences and to retrieve data where necessary.

In terms of the supply-side, the proposed methodology addresses a number of issues outlined previously. The use of multiple data sources enhances reliability as does the integration of qualitative and quantitative data analysis techniques. The business plan experiments, supported by the use of simultaneous verbal protocols ensures that lending decisions are examined in a realistic context, providing details of the loan evaluation process and risk assessment criteria that, otherwise, would be difficult to obtain. Collecting and comparing data at various stages in the evaluation process also permits greater insight into the due diligence process. Finally, use of consensus analysis enables quantitative assessment of very small subgroups of account managers, overcoming one of the main limitations associated with standard multivariate statistical analysis.

#### **4.4.1 Limitations**

There are a number of potential limitations with the methodological approach used in this research that are summarized briefly here and discussed in more detail in Chapter 7. In terms of the demand-side, the database used for the mail survey of entrepreneurs is not representative of all firms in the Province. This raises a concern with generalizability. Nonetheless, as a purposeful sample, the database ensures the heterogeneity necessary to examine firms of different levels of knowledge-intensity.

There are also a number of potential limitations associated with the methodology used to investigate the supply-side of institutional lending. The sheer volume of qualitative data obtained from the interviews and from the verbal protocols

presents a challenge to analysis and interpretation. Careful attention to systematic description and to linking data from multiple sources not only should address this issue but also should ensure results are well grounded and reliable. The experimental nature of the loan review process also poses some limitations. For example, using hypothetical entrepreneurs does not permit account managers to engage in the full due diligence process or to focus on an important variable in the lending decision — the individual entrepreneur and his/her experience, commitment and previous dealings with the financial institution.

Small sample size also presents a limitation to the use of standard multivariate analyses and to generalizability of results. Similarly, there are limitations arising from the geographic setting. As an exploratory study, findings from this thesis must be interpreted in the context of institutional lending in Newfoundland and Labrador. A final concern deals with the elements of the cultural domain, in this case, the key lending variables or criteria. Ideally the participants should define the cultural domain to ensure the dimensions reflect the experience and reality of account managers. In this study, the elements of the lending domain are drawn from the literature. To address this constraint, account managers are given the opportunity to add to the list of lending variables.

#### **4.4.2 Summary**

In summary, the methodology employed in this study utilizes triangulation of data sources and data collection methods. The mail survey of entrepreneurs provides data necessary to compare the financing experiences of entrepreneurs in knowledge-based firms to those in more traditional, less knowledge-intensive sectors. The

interviews with senior banking and government officials provide the institutional context necessary for viewing lending decisions. Finally, the two-stage data collection process used with account managers provides insight into the lending process and ensures that lending decisions are examined within the context in which they normally occur. Table 4.1 includes a summary of the methodologies employed to address each research question.

**Table 4.1**  
**Summary of Research Questions and Methodologies**

<b>Research Questions</b>	<b>Methodologies</b>
Q1: What roles have the chartered banks and government agencies played in financing KBBs compared to less knowledge-intensive firms?	<ul style="list-style-type: none"> <li>• Mail survey of firms in Newfoundland &amp; Labrador</li> </ul>
Q2: What have been the experiences of KBBs with obtaining debt financing from chartered banks and government agencies compared to less knowledge-intensive firms?	<ul style="list-style-type: none"> <li>• Mail survey of firms in Newfoundland &amp; Labrador</li> </ul>
Q3: What are the perceptions of KBBs concerning chartered bank and government financing compared with perceptions of less knowledge-intensive firms?	<ul style="list-style-type: none"> <li>• Mail survey of firms in Newfoundland &amp; Labrador</li> </ul>
Q4: Are loan evaluation and decision making affected by organizational variables and are the effects different for KBBs compared to less knowledge-intensive firms?	<ul style="list-style-type: none"> <li>• Interviews with senior officials and account managers</li> <li>• Promotional literature</li> <li>• Verbal protocols</li> <li>• Account manager requests for additional information</li> </ul>
Q5: What are the information acquisition strategies employed by account managers to support credit decision-making and are there differences between the strategies used by account managers in making lending decisions to KBBs?	<ul style="list-style-type: none"> <li>• Interviews with senior officials and account managers</li> </ul>
Q6: Does risk assessment of KBBs differ from risk assessment of less knowledge-intensive firms, and if so, how?	<ul style="list-style-type: none"> <li>• Interviews with account managers</li> <li>• Verbal protocols</li> </ul>
Q7: Do chartered banks attach different terms and conditions to loans made to KBBs than to those made to less knowledge-intensive firms and are there differences in the loan monitoring processes employed for the two types of firms?	<ul style="list-style-type: none"> <li>• Interviews with account managers</li> </ul>
Q8: Are there differences between lending decisions of chartered banks and government agencies? If differences exist, to what extent can they be explained by differences in institutional structures, loan evaluation and decision-making processes?	<ul style="list-style-type: none"> <li>• Interviews with senior officials and account managers</li> <li>• Verbal protocols</li> </ul>
Q9: Does a common or shared lending culture exist among account managers in chartered banks and government agencies?	<ul style="list-style-type: none"> <li>• Interviews with account managers</li> <li>• Consensus analysis</li> </ul>
Q10: To what extent does the lending culture within chartered banks and government agencies reflect the needs of KBBs?	<ul style="list-style-type: none"> <li>• Interviews with account managers</li> <li>• Consensus analysis</li> </ul>

Data analysis in this study integrates qualitative approaches necessary to interpret field observations of, and interviews with, account managers with the more

quantitative approaches appropriate to summarizing and interpreting findings from the survey of entrepreneurs and from the business plan reviews. Consensus analysis is used as the primary means of exploring the existence and extent of a lending culture among groups of account managers. In addition, multidimensional scaling and hierarchical clustering provide the descriptive and analytical tools necessary to depict and examine patterns of cultural agreement and consensus among respondents. Finally, standard univariate and multivariate statistical analyses are employed as appropriate.

## CHAPTER 5

### DEMAND-SIDE FINDINGS

#### 5.0 Introduction to Demand-Side Findings

One of the primary objectives of the current study is to investigate the experiences of entrepreneurs in knowledge-based firms who have sought financing from chartered banks and/or government agencies. Previous research (Groupe Secor Inc., 1998) identified the need to obtain a first-hand view from knowledge-based firms about their financing experiences, especially at the nascent stages of their development. To that end, a mail survey (Appendix 4.1) was undertaken in the spring of 1999. Survey data were analyzed to address the following research questions previously outlined in Chapter 3:

- Q1: What roles have the chartered banks and government agencies played in financing knowledge-based firms and how do they differ from the roles played in financing less knowledge-intensive firms?
- Q2: What have been the experiences of KBBs with obtaining debt financing from chartered banks and government agencies and how do they compare to the experiences of less knowledge-intensive firms?
- Q3: What are the perceptions of KBBs with respect to chartered bank and government financing and how do they compare with the perceptions of less knowledge-intensive firms?

This chapter presents results and discusses findings based on the demand-side perspective of entrepreneurs obtained from this survey. A brief overview of the survey

sample is provided initially before proceeding to the presentation and discussion of results.

## **5.1 Profile of Survey Respondents**

Of the total of 1715 mailings, 185 surveys were returned by Canada Post as undeliverable and another 58 were returned by firms for a variety of reasons, such as the firm has ceased operations, the business is not locally owned and the survey is not considered applicable. A total of 235 usable surveys were received for a response rate of 16 percent.

### **5.1.1 Profile of Owner/Managers**

Approximately 75 percent of respondents are the principal owners of the business with the remainder indicating either a minority ownership or senior managerial position. More than 83 percent started the firms while 12 percent indicated a purchase situation and slightly less than five percent inherited the business. Almost 86 percent of the respondents are male. The mean age of respondents is 45 years with 11 years experience in the firm, nine years previous business experience and eight years previous industry experience prior to involvement in the present business. The educational background at the time of becoming involved in the present business is presented in Table 5.1 which indicates 73.3 percent have completed a college diploma or university degree program. In addition, it is noteworthy that approximately a quarter of respondents holds a professional designation with professional engineer (P. Eng.) being cited most frequently.

**Table 5.1**

**Educational Level of Owners/Managers**

<b>Highest Level of Education</b>	<b>n<sup>1</sup></b>	<b>%</b>
Did not complete high school	21	9.2
High school graduate	40	17.5
Trade school or college graduate	61	26.8
University undergraduate degree	54	23.7
University graduate degree	52	22.8
Total	228	100.0

**5.1.2 Profile of Firms**

Very few respondents were able to provide Standard Industrial Classification (SIC) codes as requested in the survey. As a result, descriptions of the primary type of business provided by respondents were used to identify SIC codes. Firms were subsequently categorized as high, medium or low knowledge-intensive using the SIC categories employed by Lee and Has (1996). Table 5.2 provides a breakdown of respondent firms by level of knowledge-intensity.

**Table 5.2**

**Firms by Level of Knowledge-Intensity**

<b>Knowledge-Intensity</b>	<b>n</b>	<b>%</b>
High	85	36.2
Medium	91	38.7
Low	59	25.1
Total	235	100.0

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<sup>1</sup> Seven respondents did not indicate educational background.

To enable a comparison of respondent firms to industry sector data for the entire population of firms in the Province, SIC codes were transformed into the North American Industry Classification System (NAICS)<sup>2</sup> codes, currently used by Statistics Canada. Table 5.3 provides a summary distribution of industry sectors for respondent firms, as well as for all firms in the Province.

**Table 5.3**  
**Industry Sector Distribution**

Industry Sector	Sample (%)	Population <sup>3</sup> (%)
Agriculture, Forestry, Fishing and Hunting	3.0	3.9
Mining and Oil and Gas Extraction	3.4	0.4
Utilities	0.0	0.1
Construction	5.1	10.2
Manufacturing	38.5	4.9
Wholesale Trade	5.6	5.1
Retail Trade	3.0	16.6
Transportation and Warehousing	1.7	5.1
Information and Cultural Industries	0.0	0.9
Finance and Insurance	0.9	2.4
Real Estate and Rental Leasing	0.9	3.0
Professional, Scientific and Technical Services, Management of Companies and Enterprises, and Administrative and Support, Waste Mgt. & Remed Serv.	29.9	9.2
Educational Services	1.3	1.4
Health Care and Social Assistance	1.7	13.1
Arts, Entertainment and Recreation	2.1	2.2
Accommodation and Food Services	2.6	8.0
Other Services (Except Public Admin.)	.4	11.0
Public Administration	0.0	2.6
Total	100.0	100.0

The mean age of respondent firms is 11.6 years with 28.9 percent established in the last five years. Incorporated firms represent 83.3 percent of the total. Postal code

<sup>2</sup> NAICS was introduced in Canada in 1997.

<sup>3</sup> All firm population data were obtained from the Business Register, Statistics Canada, December 1999.



information was used to categorize firms geographically. Table 5.4 provides a summary of the geographic location of respondent firms, as well as comparable data for all firms in the Province.

**Table 5.4**  
**Geographic Distribution of Firms**

<b>Region</b>	<b>Sample (%)</b>	<b>Population (%)</b>
Avalon	61.3	46.6
Eastern	9.8	11.8
Central	8.9	18.7
Western	7.3	12.2
Northern	8.0	5.0
Labrador	4.7	5.7
Total	100.0	100.0

In terms of number of employees, the mean for full-time employment in the last fiscal year was 14.5 while the mean for part-time was 11.5. This compares to 3.3 and 2.9 employees respectively in the start-up year. The distribution of respondent firms by employment size category, as well as the comparative data for all firms in the Province is presented in Table 5.5.

**Table 5.5**  
**Distribution of Firms by Employment Size Category**

<b>Employment Size Category</b>	<b>Sample (%)</b>	<b>Population (%)</b>
1 to 4	50.6	62.0
5 to 9	19.0	18.0
10 to 19	13.0	10.3
20 to 49	10.9	6.3
50 to 99	3.3	1.9
100 to 199	2.7	0.8
200 to 499	0.0	0.4
500+	0.5	0.3
Total	100.0	100.0

A number of observations can be made on the basis of comparing the profile of respondent firms to the firm population data for the Province. First, there are a number of significant differences in industry sector representation, most notably manufacturing, retail, health care and social assistance, professional, scientific and technical services et al., and other services. The manufacturing and professional sectors are clearly overrepresented in the respondent group while several other sectors are underrepresented. Second, in terms of geographic distribution, the Avalon region is overrepresented in the respondent group at the expense of all other regions, except Northern, which are underrepresented. Third, the smallest firm size category (1 to 4 employees) is underrepresented in responses while firm size categories beyond 10 employees are overrepresented, except for firms employing 200 to 499 employees.

In total, these differences confirm that survey respondents are not representative of the entire population of firms in this Province. This finding is not surprising given the composition of the database used for the mail survey. As indicated in Chapter 4, the database was chosen as a purposeful sample to ensure heterogeneity in the population, to include cases critical for developing theory, and to examine differences between individuals or settings (Maxwell, 1998). Heterogeneity in terms of level of knowledge-intensity has been achieved as indicated by the results presented in Table 5.2. This heterogeneity ensures critical cases are included to enable investigation of differences between KBBs and less knowledge-intensive firms in terms of their dealings with financial institutions.

## 5.2 Level of Knowledge-Intensity

In the absence of a generally accepted definition of a knowledge-based business or a knowledge-based industry, the present study uses SIC information and input from entrepreneurs to classify firms by level of knowledge-intensity. The previous section described the process of establishing the SIC code for each firm. In addition to providing descriptive information on the primary type of business, survey respondents were asked to rate the importance of a number of factors to success in their industry and to indicate the extent to which these factors apply to their firm (Appendix 4.1, survey questions 16 and 17).

Initially, factor analysis was employed with the 12 items included in these two questions. Results (Table 5.6) indicate the items load onto two primary factors at both the industry level and the firm level: innovation and growth (component 1) and human capital (component 2). At the industry level, the following four factors relate primarily to innovation and growth: the importance of research and development activity, the importance of patents, the importance of innovative products and processes, and the ability to compete internationally. Also at the industry level, two items, the importance of intangible assets and the importance of a highly educated workforce, group together under human capital. Similarly, at the firm level, three items, invests heavily in research and development (R & D), exhibits a high level of innovation, and has the potential to grow rapidly, relate primarily to innovation and growth. Also at the firm level, three items, depends heavily on human capital, has a high proportion of intangible assets, and success is based primarily on knowledge, group together under human capital.

**Table 5.6****Rotated Component Matrix of Knowledge-Intensity Factors**

Item	Component	
	1	2
Importance of research and development activity	.843	.177
Importance of patents obtained	.747	-.115
Importance of innovative products and processes	.571	.368
Importance of intangible assets	.421	.624
Importance of highly educated work force	.142	.643
Importance of ability to compete internationally	.619	.322
Invests heavily in R and D	.787	.127
Exhibits a high level of innovation	.545	.472
Depends heavily on human capital	.204	.726
Has the potential to grow rapidly	.581	.318
Has a high proportion of intangible assets	.229	.762
Success is based primarily on knowledge	-3.143E-02	.712

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 3 iterations.

On the basis of the results of the factor analysis, four new variables were created by computing a simple average of the underlying factors: industry innovation, industry human capital, firm innovation, and firm human capital. Subsequently, discriminant analysis was employed to test the effectiveness of these four new predictor variables at classifying firms by level of knowledge-intensity. A process of random selection was used to select approximately half of the cases for the analysis phase with the remainder being used for the classification phase. Results (Table 5.7) indicate the predictor variables are effective at classifying firms correctly, particularly in the case of the high knowledge-intensity group.

Further, analysis of variance was used to determine whether or not significant differences exist among the three categories of knowledge-based firms for each of the four variables. Results indicate significant differences exist between groups for only

**Table 5.7**

**Discriminant Analysis Classification Results  
Level of Knowledge-Intensity**

	Level of knowledge	Predicted Group Membership			Total # (%)
		High knowledge # (%)	Medium knowledge # (%)	Low knowledge # (%)	
<b>Cases Selected</b>	High knowledge	29 (74.4)	4 (10.3)	6 (15.4)	39 (100.0)
	Medium knowledge	9 (30.0)	13 (43.3)	8 (26.7)	30 (100.0)
	Low knowledge	6 (31.6)	8 (42.1)	5 (26.3)	19 (100.0)
<b>Cases Not Selected</b>	High knowledge	24 (64.9)	7 (18.9)	6 (16.2)	37 (100.0)
	Medium knowledge	16 (36.4)	13 (29.5)	15 (34.1)	44 (100.0)
	Low knowledge	8 (29.6)	10 (37.0)	9 (33.3)	27 (100.0)

53.4 percent of selected original grouped cases correctly classified.

42.6 percent of unselected original grouped cases correctly classified.

two of the variables, industry human capital and firm human capital. Post hoc tests confirm significant differences exist between the high knowledge group and each of the medium and low knowledge categories but not between the medium and low knowledge groups. As a result, the medium and low knowledge categories have been combined for the remainder of the analysis.

### **5.3 The Role of Banks and Government in Financing KBBs at Start-up**

To address the question of the roles played by chartered banks and government agencies in financing KBBs at the start-up stage compared to less knowledge-intensive firms, survey respondents were asked to indicate the amount or percent of total start-up capital obtained from all sources. The comparison of the total amount and sources of

start-up capital used by high knowledge firms to the combined medium and low knowledge category reveals significant differences in three areas: percent contribution from personal sources, percent contribution from banks, and percent contribution in the form of government loans (Table 5.8). High knowledge firms rely on personal sources for a significantly greater percentage of financing than do less knowledge-intensive firms (70.6 % vs. 50.2%:  $p < .001$ ). Firms in the medium and low knowledge category use a significantly greater percentage of bank loans (21.0% vs. 10.7%:  $p < .05$ ) and government loans (9.7% vs. 2.3%:  $p < .01$ ) than high knowledge firms.

**Table 5.8**

**Results of T-Tests: Start-up Capital<sup>4</sup>  
High Versus Medium and Low Knowledge Firms**

	<b>High vs. Medium &amp; Low Knowledge</b>	<b>n</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean Difference</b>
<b>Personal sources (%)</b>	High knowledge	83	70.6	38.4	20.4***
	Medium & low knowledge	139	50.2	41.0	
<b>Bank loans (%)</b>	High knowledge	84	10.7	25.2	-10.3*
	Medium & low knowledge	140	21.0	33.5	
<b>Government loans (%)</b>	High knowledge	84	2.3	12.2	-7.4**
	Medium & low knowledge	140	9.7	21.4	

Sig. \* $p > .01 < .05$ ; \*\* $p > .001 < .01$ ; \*\*\* $p < .001$

These results are consistent with previous research (Thompson, Lighstone and Company, 1998) indicating the use of equity financing by KBBs is greater than for SMEs overall and indicating the median reported debt load by KBBs from financial institutions is below the SME norm. One interpretation of the findings in the present

<sup>4</sup> It is noteworthy that only 5.5% of respondents obtained start-up capital from formal venture capital sources and only 6.8% obtained start-up capital from private investors.

study is that KBBs rely more heavily on equity sources at start-up because they experience greater difficulty accessing debt financing from both chartered banks and government agencies. Another possibility is KBBs do not attempt to access these sources either because they assume they will encounter difficulty obtaining financing or because they wish to avoid using debt. Regardless of the underlying reasons, it is apparent banks and government agencies do not play as significant a role in financing KBBs at start-up as they do in financing less knowledge-intensive firms.

#### **5.4 Financing from Chartered Banks**

To determine the experiences and the perceptions of KBBs with respect to chartered bank financing, respondents were asked a number of questions concerning the timing, nature and outcome of their first attempt to access bank financing. In addition, the survey elicited respondents' opinions concerning the perceived importance of factors to the banks in making decisions on applications for financing. More than 70 percent of respondents indicated they had attempted to access bank financing on at least one occasion. Those that had not attempted to access bank financing indicated a variety of reasons, such as not needed, used personal funds, trying to avoid debt, and figured there was little or no probability of obtaining bank financing.

The average age of firms at the time of seeking their first bank financing was 3.2 years, although approximately 50 percent had sought financing when the firm was one year old or less. Approximately 30 percent had no revenues at the time they first attempted to access bank financing and approximately 40 percent were at the idea/startup stage of development. Firms contacted an average of 1.8 banks in the attempt to access financing with a relatively low percentage (7.7%) of banks contacted

located outside the Province. The mean number of banks willing to provide financing was .87 with approximately 25 percent of firms unable to obtain financing from any bank. There were no significant differences between high knowledge firms and firms in the medium and low knowledge category for any of these variables, although a lower percentage of high knowledge firms (24.2% vs. 33.3%) sought bank financing before generating any revenues.

In terms of the types of financing requested, the majority of requests were for an operating line of credit (53.0%) followed by requests for term financing (21.2%) and commercial mortgages (11.9%). Table 5.9 summarizes requests for all types of financing. Similarly, the vast majority (78.1%) of firms requested an operating line of credit followed by firms requesting term financing (31.3%) and commercial mortgages (17.5%).

**Table 5.9**  
**Types of Financing Requested from Chartered Banks**

Type of Financing	Frequency of Requests	Percent of Total Requests	Percent of Total Firms
Operating line of credit	125	53.0	78.1
Term financing	50	21.2	31.3
Commercial mortgage	28	11.9	17.5
SBLA financing	12	5.1	7.5
Export financing	5	2.1	3.0
Contract financing	5	2.1	3.0
R & D financing	2	.8	1.3
Other	9	3.8	5.6
Total number of requests	236	100.0	
Total number of firms	160		

On average, firms requested 1.5 types of financing from banks with approximately 38 percent requesting financing of two types and 9.4 percent requesting



three types of financing. There were no significant differences in the types of financing requested between firms in the high knowledge category and other firms (Pearson chi-square = 10.348 (7df)  $p = .170$ ). However, it is worth noting the percentage of high knowledge firms seeking operating credit lines was 88.1 percent compared to 71.6 percent of the medium and low knowledge category. Further, the percent of high knowledge firms seeking term financing was only 5.1 percent compared to 11.8 percent of the other firms.

Respondents also provided information on the amount of each type of financing requested (Table 5.10). With the exception of contract financing and R & D financing, the mean amount requested by high knowledge firms is lower than that requested by firms in the medium and low knowledge category (Table 5.11). The difference is significant only for the amount of operating credit requested (mean difference = 73663,  $p = .033$ ). However, the amount of term financing requested is also notably lower (mean difference = 161995,  $p = .142$ ). These findings are consistent with those reported previously, indicating high knowledge firms rely more on personal sources of financing and less on bank loans.

**Table 5.10**

**Amount of Chartered Bank Financing Requested by Type**

Type of Financing	n	Min.	Max.	Mean	Median	Std. Dev.
Operating line of credit	100	2500	1200000	89615	25000	172265
Term financing	33	5000	1000000	168318	50000	269695
Contract financing	3	.00	50000	21667	150000	25658
Commercial mortgage	17	1200	2000000	298659	125000	504311
Export financing	5	.00	1200000	353000	250000	492362
R & D financing	3	.00	50000	20000	10000	26458
SBLA financing	11	.00	250000	72182	25000	80749
Other types of financing	7	.00	25000000	3672714	25000	9406942

Table 5.11<sup>5</sup>

**Types and Amounts of Chartered Bank Financing Requested  
High versus Medium and Low Knowledge-Base**

	High vs medium and low knowledge base	n	Mean	Std. Deviation	Std. Error Mean
amount of operating line requested	high knowledge	44	48363.64	83734.37	12623.43
	low and medium knowledge	56	122026.78*	213313.99	28505.28
amount of term financing requested	high knowledge	8	45625.00	66785.23	23612.14
	low and medium knowledge	25	207580.00	298422.50	59684.50
amount of contract financing requested	high knowledge	2	32500.00	24748.73	17500.00
	low and medium knowledge	1	.00		
amount of mortgage financing requested	high knowledge	6	111500.00	168527.44	68801.04
	low and medium knowledge	11	400745.45	600204.49	180968.46
amount of export financing requested	high knowledge	2	132500.00	166170.09	117500.00
	low and medium knowledge	3	500000.00	624499.79	360555.12
amount of R & D financing requested	high knowledge	1	50000.00		
	low and medium knowledge	2	5000.00	7071.06	5000.00
amount of SBLA financing requested	high knowledge	3	125000.00	114564.39	66143.78
	low and medium knowledge	8	52375.00	62616.60	22138.31
amount of other financing requested	high knowledge	3	222000.00	328917.92	189900.85
	low and medium knowledge	4	6260750.00	12492837.77	6246418.88

\* p < .05

In addition to details of requests for bank financing, survey participants were asked about the outcome of their first attempt to access bank financing. In terms of the level of success at obtaining bank financing, a higher percentage (26.7% vs. 16.2%) of high knowledge firms were unable to obtain any financing (Table 5.12), although the difference is not significant (Pearson chi-square = 4.430 ( 2df) p = .109). Similarly, a lower percent of high knowledge firms (10.0% vs. 20.0%) were able to obtain only partial financing (less than requested). However, the percent of partial financing

<sup>5</sup> Readers are cautioned to note the limited number of responses in some categories and the high standard deviations.

obtained by high knowledge firms was higher (59% vs. 45%), although the difference was not significant<sup>6</sup>.

**Table 5.12**

**Crosstabulation: Results of First Attempt to Access Chartered Bank Financing High versus Medium and Low Knowledge Firms**

Result of First Attempt to Obtain Bank Financing		High vs. Medium and Low Knowledge		Total
		High	Low and Medium	
Eventually obtained the full amount requested	Count	38	67	105
	Expected Count	38.2	66.8	105.0
	% within describes first attempt to access financing	36.2%	63.8%	100.0%
	% within high vs. medium and low knowledge base	63.3%	63.8%	63.6%
	% of Total	23.0%	40.6%	63.6%
Eventually Obtained some Financing but less than requested	Count	6	21	27
	Expected Count	9.8	17.2	27.0
	% within describes first attempt to access financing	22.2%	77.8%	100.0%
	% within high vs. medium and low knowledge base	10.0%	20.0%	16.4%
	% of Total	3.6%	12.7%	16.4%
Was not Successful at Obtaining any Bank financing	Count	16	17	33
	Expected Count	12.0	21.0	33.0
	% within describes first attempt to access financing	48.5%	51.5%	100.0%
	% within high vs. medium and low knowledge base	26.7%	16.2%	20.0%
	% of Total	9.7%	10.3%	20.0%
Total	Count	60	105	165
	Expected Count	60.0	105.0	165.0
	% within describes first attempt to access financing	36.4%	63.6%	100.0%
	% within high vs. medium and low knowledge base	100.0%	100.0%	100.0%
	% of Total	36.4%	63.6%	100.0%

<sup>6</sup> t = .914 (18df) mean difference = 13.85 sig. (2-tailed) p = .373

Respondents who were turned down for financing or received less than requested provided details on the reasons given by the banks, as well as their own perceptions of the real reasons for the turndowns. Table 5.13 provides a summary of combined responses for both categories.

**Table 5.13**

**Reasons for Turndown of Requests for Chartered Bank Financing**

Reason	Bank Reasons		Perceived Reasons	
	n	%	n	%
Insufficient collateral/security	33	18.6	18	11.2
Business too risky	26	14.7	16	9.9
Insufficient income or revenue	23	13.0	9	5.6
Bank rules/requirements overly strict	21	11.9	31	19.3
Insufficient cash flow	18	10.2	12	7.5
Not willing to lend to this type of business	18	10.2	24	14.9
No guarantor	13	7.3	12	7.5
Account manager didn't understand business	9	5.1	28	17.4
Poor credit history	5	2.8	2	1.2
Other	4	2.3	4	2.5
Limited management expertise	3	1.7	3	1.8
Don't know/can't recall	2	1.1	2	1.2
No reason given	2	1.1		
Total	177	100.0	161	100.0

A review of the results presented in Table 5.13 reveals some notable differences between the reasons given by the banks and respondents' perceptions of the real reasons. According to respondents, insufficient collateral/security, business is too risky and insufficient income or revenue were the three top reasons given by the banks. These three accounted for 46.3 percent of the total mentions. However, when asked to indicate what they perceived were the real reasons for being turned down by the banks, the same three reasons were mentioned only 26.7 percent of the time. The top three mentions cited as the real reasons were bank rules/requirements overly strict, account

manager did not understand my business and the banks are not willing to lend to this type of business. These three accounted for 51.6 percent of the total mentions.

There were no significant differences<sup>7</sup> between bank reasons mentioned by high knowledge firms and those identified by less knowledge-intensive firms. However, a greater percentage of high knowledge firms (56.0% vs. 40.4%) cited insufficient collateral/security as a reason given by the banks. In terms of perceptions of the real reasons for turndowns by banks, there were no significant differences<sup>8</sup> between high knowledge firms and firms in the medium and low knowledge category.

In addition to the perceptions of those who experienced turndowns by banks, all respondents who sought bank financing were asked to indicate the degree of importance they felt the bank attached to a number of factors in making a decision on the application for financing. Responses are presented in Table 5.14. With the exception of other factors introduced by respondents (4.73), collateral/security available (4.40), track record of the entrepreneur (3.80) and potential cash flow (3.72) were accorded the highest ratings. All factors received ratings of 3.0 or higher out of a possible 5.0 with the exception of uniqueness of product/service (2.90) and other funding available (2.94).

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<sup>7</sup> Pearson chi-square = 15.393 (11df) p = .165

<sup>8</sup> Pearson chi-square = 12.868 (9df) p = .169

**Table 5.14****Summary Statistics: Perceived Importance of Factors to Chartered Banks**

<b>Factor</b>	<b>n</b>	<b>Min.</b>	<b>Max.</b>	<b>Mean</b>	<b>Std. Dev.</b>
Past relationship with bank	164	1.00	5.00	3.63	1.53
Market potential	163	1.00	5.00	3.45	1.31
Completed business plan	162	1.00	5.00	3.60	1.40
Type of industry	162	1.00	5.00	3.52	1.20
Collateral/security available	164	1.00	5.00	4.40	1.04
Proven/product service	162	1.00	5.00	3.55	1.33
Other funding available	160	1.00	5.00	2.94	1.48
Stage of development of business	163	1.00	5.00	3.50	1.22
Track record of entrepreneur	163	1.00	5.00	3.80	1.39
Uniqueness of product/service	162	1.00	5.00	2.90	1.38
Potential cash flow	162	1.00	5.00	3.72	1.25
Management team	163	1.00	5.00	3.45	1.30
Demonstrated market acceptance	163	1.00	5.00	3.23	1.35
General economic conditions	161	1.00	5.00	3.21	1.20
Other factors	11	3.00	5.00	4.73	.65

A follow-up question asked respondents to indicate the two most important of these factors. Table 5.15 presents the frequencies of the combined mentions ranked from highest to lowest. Collateral/security available and the track record of the entrepreneur remain at or near the top based on these combined ratings. However, it is noteworthy that past relationships with the bank received the second highest total mentions while potential cash flow appears to be far less important at seventh on the list.

**Table 5.15****Combined Total of First and Second  
Most Important Factors to Chartered Banks**

<b>Factor</b>	<b>n</b>	<b>%</b>
Collateral/security available	83	25.6
Past relationship with bank	60	18.5
Track record of entrepreneur	34	10.5
Completed business plan	26	8.0
Market potential	25	7.7
Type of industry	21	6.5
Potential cash flow	15	4.6
Stage of development of business	11	3.4
Proven/product service	11	3.4
Other factors	9	2.8
Other funding available	8	2.5
Management team	7	2.2
Demonstrated market acceptance	7	2.2
General economic conditions	5	1.5
Uniqueness of product/service	2	.6
Total	324	100.0

A comparison between high knowledge firms and medium and low knowledge firms of the perceived importance of these factors to the banks indicates high knowledge firms rate all factors lower than less knowledge-intensive firms. The differences between the mean ratings are significant on 10 of the 14 factors (Table 5.16).

**Table 5.16**

**Perceived Importance of Factors to Chartered Banks  
High versus Medium and Low Knowledge Firms**

<b>Factor</b>	<b>High vs. Medium and Low Knowledge-Base</b>	<b>n</b>	<b>Mean</b>	<b>Mean Diff.</b>
Past relationship with bank	High	62	3.45	-.30
	Low and medium	102	3.75	
Market potential	High	60	2.97	-.76***
	Low and medium	103	3.73	
Completed business plan	High	59	3.19	-.65**
	Low and medium	103	3.84	
Type of industry	High	60	3.23	-.45*
	Low and medium	102	3.69	
Collateral/security available	High	61	4.38	-.03
	Low and medium	103	4.41	
Proven/product service	High	60	3.22	-.53*
	Low and medium	102	3.75	
Other funding available	High	59	2.85	-.15
	Low and medium	101	3.00	
Stage of development of business	High	61	3.21	-.45*
	Low and medium	102	3.67	
Track record of entrepreneur	High	61	3.30	-.80***
	Low and medium	102	4.10	
Uniqueness of product/service	High	60	2.48	-.67**
	Low and medium	102	3.15	
Potential cash flow	High	60	3.58	-.21
	Low and medium	102	3.79	
Management team	High	61	3.16	-.45*
	Low and medium	102	3.62	
Demonstrated market acceptance	High	61	2.77	-.73**
	Low and medium	102	3.50	
General economic conditions	High	61	2.75	-.74***
	Low and medium	100	3.49	
Other factors	High	3	4.33	-.54
	Low and medium	8	4.88	

Sig. \*  $p > .01 < .05$ ; \*\*  $p > .001 < .01$ ; \*\*\*  $p < .001$

A comparison between the two groups of the combined responses for the two most important factors, reveals strong similarities in the rank order of importance



(Table 5.17) with one exception, high knowledge firms perceive market potential to be far less important to banks than firms in the medium and low knowledge category.

**Table 5.17**  
**Combined Total of First and Second**  
**Most Important Factors to Chartered Banks**

Factor	All Firms		High Knowledge		Medium and Low Knowledge	
	n	%	n	%	n	%
Collateral/security available	83	25.6	35	29.4	48	23.4
Past relationship with bank	60	18.5	24	20.2	36	17.6
Track record of entrepreneur	34	10.5	14	11.8	20	9.8
Completed business plan	26	8.0	10	8.4	16	7.8
Market potential	25	7.7	2	1.7	23	11.2
Type of industry	21	6.5	7	5.9	14	6.8
Potential cash flow	15	4.6	6	5.0	9	4.4
Stage of development of firm	11	3.4	7	5.9	4	2.0
Proven/product service	11	3.4	2	1.7	9	4.4
Other factors	9	2.8	4	3.4	5	2.4
Other funding available	8	2.5	3	2.5	5	2.4
Management team	7	2.2	2	1.7	5	2.4
Market acceptance	7	2.2	1	.8	6	2.9
General economic conditions	5	1.5	2	1.7	3	1.5
Uniqueness of product/service	2	.6	0	0.0	2	1.0
Total	324	100.0	119	100.0	205	100.0

#### 5.4.1 Summary Findings of Financing from Chartered Banks

In summary, there were three notable differences between the experiences of KBBs and those of less knowledge-intensive firms in terms of obtaining debt financing from chartered banks. First, although not statistically significant, KBBs were more likely to seek operating credit and less likely to seek term financing. This is consistent with the fact that high knowledge firms have fewer tangible assets and may have greater needs to finance working capital requirements and soft costs, such as research

and development. Second, the mean amount of operating credit requested by KBBs is significantly lower than less knowledge-intensive firms and the amount of term financing requested is also notably lower, although the latter difference is not significant. This could suggest KBB requirements for financing are not as great or that KBBs reduce their requests for assistance because they lack tangible collateral and security to support requests for higher amounts. Third, the percentage of high knowledge firms unable to obtain any financing was 26.7 percent compared to 16.2 percent for more traditional firms. Although this difference was not statistically significant, it does suggest high knowledge firms may experience more difficulty obtaining bank financing at start-up than firms in the medium and low knowledge category.

There were two notable differences between the perceptions of KBBs and less knowledge-intensive firms in terms of access to bank financing. First, a greater percentage of high knowledge firms (56.0% vs. 40.4%) cite insufficient collateral/security as the reason given by the banks for turndowns or reduced funding. Again, this is consistent with the lack of tangible assets held by KBBs. If these perceptions are accurate, the chartered banks may not be valuing and collateralizing intangible assets when assessing applications for financing from KBBs. Second, high knowledge firms perceive banks to attach less importance to all lending criteria than do less knowledge-intensive firms. Differences were significant on 10 of 14 variables. However, there were strong similarities between the two groups in terms of rank order of importance of the variables.

## 5.5 Financing from Government Departments and Agencies

To determine the experiences and the perceptions of KBBs with respect to government financing, respondents were asked the same questions as for bank financing, only this time concerning the timing, nature and outcome of their first attempt to access government financing. Similarly, the survey elicited respondents' opinions concerning the perceived importance of factors to government agencies in making decisions on applications for financing.

Over two thirds of respondents (67.7%) had requested funding from at least one government department or agency. Those that had not attempted to access government financing indicated a variety of reasons, such as, it has not been necessary, too much red tape involved in government financing, was not aware of the programs and criteria, was not eligible, and relied on my bank instead. Table 5.18 provides a summary of funding requests from six specific government departments or agencies, as well as an indication of requests made to other government organizations. Funding requests to ACOA, BDC and DDDR comprise 72.1 percent of the total number of requests. It is noteworthy that 7.6 percent of funding requests were made to other organizations. The most frequently cited of these organizations was Human Resources Development Canada (HRDC), which provides salary subsidies to support job creation.

**Table 5.18****Summary of Requests for Government Financing**

<b>Government Organization</b>	<b>N</b>	<b>%</b>
Atlantic Canada Opportunities Agency (ACOA)	125	32.5
Business Development Bank of Canada (BDC)	66	17.2
Department of Development and Rural Renewal (DDRR)	86	22.4
Department of Industry Trade and Technology (DITI)	29	7.6
Industry Canada (IC)	14	3.6
National Research Council (NRC)	35	9.1
Other government organizations	29	7.6
Total	384	100.0

The average age of firms at the time of seeking their first government financing was 4.4 years, somewhat older than those seeking bank financing (3.2 years) for the first time. Approximately 45 percent had sought government financing when the firm was one year old or less compared to 50 percent of those seeking bank financing for the first time. Approximately 34 percent had no revenues at the time they first attempted to access government financing and approximately 37 percent were at the idea/startup stage of development. This compares to 30 percent and 40 percent respectively for those seeking bank financing.

The comparison between high knowledge firms and firms in the medium and low knowledge category indicates no significant difference in the mean age of firms at the time of requesting financing. However, crosstabulation results reveal significant differences between the two groups in terms of stage of development and annual gross sales or revenues at the time of seeking first government financing. A significantly lower percentage of firms in the high knowledge category sought financing at the idea/startup stage (22.0% vs. 43.8%), while a significantly higher percentage sought

financing at the product/market development stage (60.0% vs. 40.0%)<sup>9</sup>. Similarly, a significantly lower percentage of high knowledge firms sought financing before generating sales or revenues (24.0% vs. 39.3%)<sup>10</sup>.

In terms of the types of financing requested from government sources (Table 5.19), the majority of requests were for term financing (26.3%) followed by requests for an operating line of credit (17.4%) and commercial mortgages (13.1%). Similarly, the highest percentage (35.2%) of firms requested term financing followed by firms requesting an operating line of credit (23.2%) and commercial mortgages (17.6%). This is a considerably different picture from that of requests for bank financing which were heavily dominated by applications for operating credit lines (see Table 5.9). Other notable differences compared to chartered bank financing are the increased reliance on government as a source of R & D financing and contract financing. Further, more than a quarter of firms seeking government financing cited additional types of assistance not normally available from private sector sources, such as the wage subsidy programs of IIRDC mentioned previously.

On average, firms requested 1.3 types of financing from government sources with approximately 30 percent requesting financing of two types and 10.7 percent requesting three types of financing. Only two firms had attempted to access four types of financing. The comparison of high knowledge firms to firms in the medium and low knowledge group indicates a lower percent (17.0% vs. 28.3%) of the high knowledge group sought term financing while a much higher percent (21.3% vs. 7.1%) sought R & D financing, although the differences were not significant<sup>11</sup>.

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<sup>9</sup> Pearson chi-square = 16.504 (5df) p = .006

<sup>10</sup> Pearson chi-square = 11.212 (5df) p = .047

<sup>11</sup> Pearson chi-Square = 11.155 (6df) p = .084

**Table 5.19****Types of Financing Requested from Government Agencies**

Type of Financing Requested	Frequency of Requests	Percent of Total Requests	Percent of Total Firms
Operating line of credit	37	17.4	23.2
Term financing	56	26.3	35.2
Commercial mortgage	28	13.1	17.6
SBLA financing	6	2.8	3.8
Export financing	5	2.4	3.1
Contract financing	12	5.6	7.5
R & D financing	27	12.7	17.0
Other	42	19.7	26.4
Total number of requests	213	100.0	
Total number of firms	159		

Respondents also provided information on the amounts of financing requested from government agencies (Table 5.20). A comparison of the means of high knowledge firms to firms in the medium and low knowledge category revealed no significant differences (Table 5.21). However, the additional R & D financing obtained by high knowledge firms is noteworthy (mean difference = 74183  $p = .179$ ).

**Table 5.20****Amount of Government Financing Requested by Type**

Type of Financing	n	Min.	Max.	Mean	Median	Std. Dev.
Operating line of credit	17	5000	50000	86882	50000	125043
Term financing	33	7000	75000	155727	50000	205698
Contract financing	7	5000	16500	46714	15000	57436
Commercial mortgage	17	600	50000	146623	50000	176191
Export financing	5	5900	12500	278180	25000	544596
R & D financing	18	5000	50000	61970	17732	114510
SBLA financing	5	5000	25000	111000	25000	127151
Other types of financing	14	1000	60000	113500	27500	167422

Table 5.21<sup>12</sup>

**Types and Amounts of Government Financing Requested  
High versus Medium and Low Knowledge-Base<sup>13</sup>**

Group Statistics

	High vs medium and low knowledge base	N	Mean	Std. Deviation	Std. Error Mean
amount of operating line of credit requested	high knowledge	4	51250.00	37052.8901	18526.4451
	low and medium knowledge	13	97846.15	141248.51	39175.2876
amount of term financing requested	high knowledge	9	100555.6	120867.81	40289.2704
	low and medium knowledge	24	176416.7	228362.59	46614.3178
amount of contract financing requested	high knowledge	4	36250.00	28394.5417	14197.2709
	low and medium knowledge	3	60666.67	90423.0796	52205.7894
amount of mortgage financing requested	high knowledge	5	169800.0	174671.69	78115.5554
	low and medium knowledge	12	136966.7	183612.47	53004.3556
amount of export financing requested	high knowledge	1	100000.0		
	low and medium knowledge	4	322725.0	618237.85	309118.92
amount of R & D financing requested	high knowledge	8	103182.9	165837.90	58632.5511
	low and medium knowledge	10	29000.00	25690.4652	8124.0384
amount of SBLA financing requested	high knowledge	2	127500.0	173241.16	122500.00
	low and medium knowledge	3	100000.0	129903.81	75000.0000
amount of other financing requested	high knowledge	4	159000.0	294166.62	147083.31
	low and medium knowledge	10	95300.00	101760.12	32179.3757

Firms that attempted to access government financing were asked to indicate the outcome of their application for each agency contacted. Summary results are presented in Table 5.22. Applications made to the ACOA and the NRC received the highest percentage of full funding approval at 48.7 percent and 50.0 percent respectively. However, combined success rates for full and partial funding were similar across all organizations in the range of 67.9 to 75.0 percent with the exception of the BDC at 52.2 percent.

<sup>12</sup> Readers are cautioned to note the limited number of responses in some categories and the high standard deviations.

<sup>13</sup> No significant differences were found.

**Table 5.22**

**Summary Results of Attempts to Access Government Financing**

Organization	Received Full Funding		Received Partial Funding		Did Not Receive Funding		Total	
	n	%	n	%	n	%	n	%
ACOA	57	48.7	26	22.2	34	29.1	117	100.0
BDC	21	33.3	12	19.0	30	47.6	63	100.0
DDRR	33	40.2	27	32.9	22	26.8	82	100.0
DITT	7	25.0	12	42.9	9	32.1	28	100.0
IC	8	42.1	6	31.6	5	26.3	19	100.0
NRC	17	50.0	7	20.6	10	29.4	34	100.0
Other	16	57.1	5	17.9	7	25.0	28	100.0

A comparison of high knowledge firms to firms in the medium and low knowledge category for each agency revealed no significant differences, although applications by high knowledge firms to DDRR, DITT, IC, NRC and other organizations received higher percentages of full funding (Table 5.23). Caution should be exercised in interpreting these results given the small number of cases involved in some organizations.

**Table 5.23**

**Percent of Applications Receiving Full Funding  
High versus Medium and Low Knowledge Base**

Government Organization	Percent of Applications Receiving Full Funding	
	High Knowledge	Medium and Low Knowledge
Atlantic Canada Opportunities Agency	50.0	48.3
Business Development Bank of Canada	31.3	34.0
Department of Development and Rural Renewal	52.4	36.1
Department of Industry Trade and Technology	36.4	16.7
Industry Canada	71.4	25.0
National Research Council	58.8	41.2
Other government organizations	66.7	52.2



Respondents who were turned down for financing or received less than requested were asked to indicate the reasons given by the funding agencies, as well as their own perceptions of the real reasons. Table 5.24 provides a summary of combined responses for both categories.

**Table 5.24**

**Reasons for Turndown of Requests for Government Financing**

Reason	Org. Reasons		Perceived Reasons	
	n	%	n	%
Gov't. rules/requirements overly strict	19	17.6	18	17.1
Not willing to lend to this type of business	18	16.6	22	20.9
Business too risky	15	13.9	8	7.6
Insufficient income or revenue	12	11.1	7	6.7
Insufficient collateral/security	12	11.1	7	6.7
Insufficient cash flow	9	8.3	4	3.8
Account manager didn't understand business	6	5.6	17	16.2
Limited management expertise	5	4.6	7	6.7
Other	4	3.7	8	7.6
Don't know/can't recall	3	2.8	3	2.9
No guarantor	2	1.9	4	3.8
No reason given	2	1.9	0	0.0
Poor credit history	1	.9	0	0.0
Total	108	100.0	105	100.0

Comparing the reasons attributed to government agencies to respondents' perceptions of the real reasons indicates considerable similarity with two exceptions, business too risky and account manager didn't understand my business. The former is more likely to be cited as a reason for turndown by government organizations, while the latter is more likely to be perceived by respondents as the real reason for turndown. Overly strict government rules/requirements and not willing to lend to this type of business are cited as the top two reasons attributed to the funding agencies and the top two real reasons in the view of respondents. Comparing reasons for turndowns by

banks to government turndowns highlights one very notable difference, the importance of collateral/security to the banks. This factor is cited far less frequently in relation to government funding.

A comparison of reasons for turndowns attributed to government agencies by high knowledge firms to reasons mentioned by firms in the medium and low knowledge category, indicates no significant differences<sup>14</sup>. Similarly, in terms of the perceptions of the real reasons for turndowns by government agencies, there were no significant differences between high knowledge firms and firms in the medium and low knowledge category<sup>15</sup>.

As was the case for financing from chartered banks, all respondents were asked to indicate the degree of importance they felt government organizations attached to a number of factors in making decisions on their application for financing. The list of factors presented to respondents was a duplicate of the one provided in the banking segment of the survey. Responses are summarized in Table 5.25.

With the exception of other factors introduced by respondents (4.50), a completed business plan (4.22), market potential (4.15) and type of industry (3.99) were accorded the three highest ratings. None of these three appeared at the top of the list of factors felt to be important to the banks. Similarly, uniqueness of product/service was rated more highly in the case of government financing (3.54) than for bank financing (2.90). Other notable differences include past relationships and collateral/security available which were considered to be far less important to government (2.61 and 3.11 respectively) than to banks (3.63 and 4.40).

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<sup>14</sup> Pearson chi-square = 5.919 (9df) p = .748

<sup>15</sup> Pearson chi-square = 12.514 (10df) p = .252

**Table 5.25****Summary Statistics: Perceived Importance of Factors to Government Agencies**

<b>Factor</b>	<b>n</b>	<b>Min.</b>	<b>Max.</b>	<b>Mean</b>	<b>Std. Dev.</b>
Past relationship with organization	140	1.00	5.00	2.61	1.53
Market potential	148	1.00	5.00	4.15	1.05
Completed business plan	146	1.00	5.00	4.22	1.09
Type of industry	147	1.00	5.00	3.99	.99
Collateral/security available	141	1.00	5.00	3.11	1.35
Proven/product service	140	1.00	5.00	3.53	1.25
Other funding available	134	1.00	5.00	3.17	1.33
Stage of development of business	142	1.00	5.00	3.57	1.14
Track record of entrepreneur	143	1.00	5.00	3.67	1.28
Uniqueness of product/service	142	1.00	5.00	3.54	1.30
Potential cash flow	144	1.00	5.00	3.61	1.15
Management team	142	1.00	5.00	3.77	1.14
Demonstrated market acceptance	140	1.00	5.00	3.71	1.17
General economic conditions	138	1.00	5.00	3.25	1.07
Other factors	14	2.00	5.00	4.50	.94

The follow-up question asked respondents to indicate the two most important of these factors. Table 5.26 presents the frequencies of the combined mentions ranked from highest to lowest. Based on these combined ratings, track record of the entrepreneur emerges as one of the top factors in addition to market potential, completed business plan and type of industry. Track record of the entrepreneur is the only common factor among the top three factors of importance to the banks and government funding agencies. However, there is considerable consistency among the top five factors of perceived importance to the two groups.

**Table 5.26****Combined Total of First and Second  
Most Important Factors to Government Organizations**

<b>Factor</b>	<b>n</b>	<b>%</b>
Market potential	53	18.3
Completed business plan	49	16.9
Track record of entrepreneur	26	9.0
Type of industry	25	8.7
Collateral/security available	21	7.3
Uniqueness of product/service	16	5.5
Proven/product service	16	5.5
Stage of development of business	15	5.2
Management team	15	5.2
Other factors	12	4.2
Other funding available	11	3.8
Potential cash flow	10	3.5
Past relationship with organization	9	3.1
Demonstrated market acceptance	7	2.4
General economic conditions	4	1.4
<b>Total</b>	<b>289</b>	<b>100.0</b>

The comparison between high knowledge firms and firms in the medium and low knowledge category of the perceived importance of these factors to government agencies indicates high knowledge firms rate all factors, except past relationships and uniqueness of products/services, lower than firms in the medium and low knowledge category. The mean differences are significant on four of the 14 factors (Table 5.27), indicating less variation than was true for the banks.

The comparison between the two groups of the combined responses for the two most important factors reveals (Table 5.28) only minor differences in the rank order of importance.

Table 5.27

Perceived Importance of Factors to Government Agencies  
High versus Medium and Low Knowledge Firms

Factor	High vs. Medium and Low Knowledge Base	n	Mean	Mean Diff.
Past relationship with organization	High	46	2.76	.23
	Low and medium	94	2.53	
Market potential	High	47	4.02	-.19
	Low and medium	101	4.21	
Completed business plan	High	47	3.96	-.38*
	Low and medium	99	4.34	
Type of industry	High	47	3.77	-.32
	Low and medium	100	4.09	
Collateral/security available	High	47	2.68	-.65**
	Low and medium	94	3.33	
Proven/product service	High	47	3.17	-.54*
	Low and medium	93	3.71	
Other funding available	High	45	2.87	-.46
	Low and medium	89	3.33	
Stage of development of business	High	46	3.41	-.23
	Low and medium	96	3.65	
Track record of entrepreneur	High	46	3.46	-.31
	Low and medium	97	3.77	
Uniqueness of product/service	High	46	3.59	.08
	Low and medium	96	3.51	
Potential cash flow	High	47	3.47	-.21
	Low and medium	97	3.68	
Management team	High	46	3.63	-.21
	Low and medium	96	3.84	
Demonstrated market acceptance	High	46	3.50	-.32
	Low and medium	94	3.82	
General economic conditions	High	45	2.96	-.44*
	Low and medium	93	3.40	
Other factors	High	5	4.40	-.16
	Low and medium	9	4.56	

Sig. \*  $p > .01 < .05$ ; \*\*  $p < .01$

**Table 5.28**

**Combined Total of First and Second  
Most Important Factors to Government Agencies**

Factor	All Firms		High Knowledge		Medium and Low	
	n	%	n	%	n	%
Market potential	53	18.3	14	15.2	39	19.8
Completed business plan	49	16.9	18	19.6	31	15.7
Track record of entrepreneur	26	9.0	6	6.5	20	10.2
Type of industry	25	8.7	8	8.7	17	8.6
Collateral/security available	21	7.3	10	10.9	11	5.6
Uniqueness of product/service	16	5.5	5	5.4	11	5.6
Proven/product service	16	5.5	3	3.3	13	6.6
Stage of development of business	15	5.2	6	6.5	9	4.6
Management team	15	5.2	6	6.5	9	4.6
Other factors	12	4.2	5	5.4	7	3.6
Other funding available	11	3.8	2	2.2	9	4.6
Potential cash flow	10	3.5	5	5.4	5	2.5
Past relationship with agency	9	3.1	3	3.3	6	3.0
Demonstrated market acceptance	7	2.4	1	1.1	6	3.0
General economic conditions	4	1.4	0	0.0	4	2.0
Total	289	100.0	92	100.0	197	100.0

**5.5.1 Summary Findings of Financing from Government Agencies**

In summary, analysis of survey data concerning government financing revealed a number of noteworthy differences between high knowledge firms and firms in the medium and low knowledge category. First, there were differences in terms of the stage of development at which the two groups of firms first sought financing. A significantly lower percentage of firms in the high knowledge category sought financing at the idea/startup stage (22.0% vs. 43.8%), while a significantly higher percentage sought financing at the product/market development stage (60.0% vs. 40.0%). Similarly, a significantly lower percentage of high knowledge firms (24.0%) sought financing before generating sales or revenues compared to medium and low

knowledge firms (39.3%). It is not clear to what extent these findings may be explained by differences in the financial needs of KBBs, by differences in financial programs available to KBBs, and/or by reluctance on the part of KBBs to approach government agencies earlier in their development.

Second, as was the case with access to bank finance, there were some differences between high knowledge and less knowledge-intensive firms in terms of the types and amounts of finance requested from government agencies. A lower percent (17.0% vs. 28.3%) of high knowledge firms sought term financing while a much higher percent (21.3% vs. 7.1%) sought R & D financing. These findings are consistent with the needs of KBBs to finance greater soft costs, such as research and development and to finance fewer tangible assets, thus a reduced requirement for term loans.

Third, there was one notable difference between the two groups of firms in terms of their success obtaining government financing. Although the difference was not significant, the percent of applications by high knowledge firms that received full funding from government was higher than firms in the less knowledge-intensive category for all government agencies, except the Business Development Bank of Canada. It may be that some government agencies look more favourably on KBBs because such firms mesh better with institutional mandates, programs and services.

Finally, there were a number of differences between high knowledge firms and firms in the medium and low knowledge group in terms of the factors considered to be important to government agencies when making decisions on applications for funding. High knowledge firms rated all factors lower than other firms except for past relationships and uniqueness of products/services. However, the differences were significant on only four of the 14 factors, suggesting less variation between the two

groups than was evident for perceptions of importance of the factors to the chartered banks.

## **5.6 Comparison of Bank Financing to Government Financing**

At a broader level, it is also useful to compare access to chartered bank financing to access to government financing. Results indicate similar percentages of respondents had attempted access to bank financing (71.5%) and government financing (67.7%). There were also similarities in the timing of access to both types of assistance. The average age of firms at the time of seeking their first government financing was 4.4 years, slightly older than firms seeking bank financing (3.2 years) for the first time. Approximately 45 percent of firms sought government financing when the firm was one year old or less compared to 50 percent of firms seeking bank financing for the first time. Further, 34 percent of firms had no revenues at the time they first attempted to access government financing and approximately 37 percent were at the idea/startup stage of development. This compares to 30 percent and 40 percent respectively for those seeking bank financing.

There were a number of notable differences between the types of finance requested from the two funding sources. The majority of requests for government assistance were for term financing (26.3%) followed by requests for an operating line of credit (17.4%) and commercial mortgages (13.1%). Requests for bank financing, on the other hand, were heavily dominated by applications for operating credit lines (53.0%). Further, the percentages of firms that requested R & D and contract financing from government were 17.0 percent and 7.5 percent respectively compared to 1.3 percent and 3.0 percent requesting the same types of financing from banks.



Respondents also perceived differences in the relative importance of lending criteria employed by the two funding sources when making decisions on financing applications. While there appears to be agreement that the track record of the entrepreneur is of considerable importance to both groups, collateral/security available is seen to be of significantly greater importance to the banks. Conversely, respondents perceive government agencies place greater reliance on a completed business plan and market potential.

Finally, the comparison between reasons for turndowns attributed to banks and reasons for turndowns by government agencies highlighted one very notable difference, the importance of collateral/security. This factor is cited far less frequently in relation to government assistance than bank financing. However, there was considerable agreement on the critical role that organizational rules and requirements and type of business play in the financing decisions of chartered banks and government agencies.

## **5.7 Summary of Demand-Side Findings**

The primary purpose of the survey was to investigate the experiences of entrepreneurs in knowledge-based firms who have sought financing from chartered banks and/or government agencies. Survey data provide insight into the experiences and perceptions of entrepreneurs in high knowledge firms compared to those in less knowledge-intensive businesses concerning financing from both sources.

As a first step in this investigation, the analysis focused on the sources and amounts of start-up capital utilized by entrepreneurs. The comparison between high knowledge firms and less knowledge-intensive firms in terms of sources of start-up capital indicated significant differences in three areas. High knowledge firms relied

more heavily on personal sources of capital (70.6% vs. 50.2%), whereas less knowledge-intensive businesses made greater use of chartered bank financing (21.0% vs. 10.7%) and government loans (9.7% vs. 2.3%). Thus, in response to research question Q1<sup>16</sup>, it appears as though chartered banks and government agencies do not play as significant a role in financing high knowledge firms at start-up as they do in financing less knowledge-intensive firms. This finding confirms results of prior research indicating KBBs rely more heavily on equity and use less debt from financial institutions (Thompson, Lightstone and Company, 1998).

To address research question Q2<sup>17</sup>, the survey elicited input from entrepreneurs in terms of their dealings with chartered banks and government agencies. More specifically, respondents provided information on the timing, nature and outcome of their first attempt to access financing from a chartered bank and their first attempt to access financing from a government agency. Findings indicate considerable similarities in timing of access to both sources of financing. Although there were no significant differences between high knowledge firms and less knowledge-intensive businesses in terms of timing of access to chartered bank financing, a significantly lower percentage of KBBs sought financing from government agencies at the earliest stages of development and prior to generating any sales or revenues. There are a number of potential explanations for these timing differences, some reflecting demand-side requirements and others reflecting supply-side constraints. It may be the needs of KBBs are not as great at the earlier stages of development. It is also possible there is limited financing available to serve their needs at this point. Similarly, it may be that

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<sup>16</sup> Q1: What roles have the chartered banks and government agencies played in financing knowledge-based firms and how do they differ from the roles played in financing less knowledge-intensive firms?

<sup>17</sup> Q2: What have been the experiences of KBBs with obtaining debt financing from chartered banks and government agencies and how do they compare with the experiences of less knowledge-intensive firms?

KBBs are more reluctant to approach government agencies at start-up because they perceive difficulty in obtaining financing at this early stage.

In terms of types of financing requested, there were a number of notable differences between high knowledge businesses and less knowledge-intensive firms. Although not statistically significant, KBBs were more likely to seek operating credit and less likely to request term financing from chartered banks than less knowledge-intensive firms. KBBs also requested significantly lower amounts of operating credit and notably, albeit not significantly, lower amounts of term financing from banks than did less knowledge-intensive businesses. Requests for government assistance by KBBs were more likely to be for R & D financing and less likely to be for term financing than was the case for firms in the medium and low knowledge category. There were no significant differences in the amounts of finance requested from government agencies by KBBs compared to firms in the medium and low knowledge category. Findings concerning the types and amounts of financing requested by KBBs confirm the need for operating credit to support working capital and soft costs, such as research and development, rather than term loans to acquire fixed assets.

In terms of outcome, and more specifically, success obtaining financing, high knowledge firms were less likely to obtain chartered bank financing than less knowledge-intensive firms, although the difference was not significant. On the other hand, the level of success in obtaining the full amount requested from all government agencies, except the BDC, was higher for KBBs. Again, the differences were not significant. These findings suggest efforts by the chartered banks to serve the needs of KBBs have been less than successful, at least in the view of potential clients. Government agencies, on the other hand, appear to look more favourably on KBBs, as

evidenced by the level of success achieved by high knowledge firms in obtaining government support.

Finally, to address research question Q3<sup>18</sup>, the study analyzed respondents' perceptions of the rationale provided by financial institutions for declining applications for financing (or reducing the amount requested) and respondents' opinions on the importance of lending criteria to financial institutions. The most notable difference between the high knowledge group and firms in the medium and low knowledge category is the perception by KBBs that chartered banks place greater weight on collateral and security. This finding is consistent with those of Philpott (1995) indicating entrepreneurs in KBBs perceive that banks use collateral in lieu of technology assessment. KBBs also perceive both groups of lending institutions attach less importance to most lending criteria, although there is a high level of agreement between KBBs and less knowledge-intensive firms on the rank order of importance of identified criteria.

If the opinions and perceptions of entrepreneurs in KBBs represent an accurate reflection of lending practices, the implication is clear — chartered banks take a traditional approach to risk assessment, emphasizing collateral in the form of physical, tangible security to the potential detriment of knowledge-based businesses. This has significant implications for KBBs in search of chartered bank financing and could potentially lead KBBs to ignore traditional bank finance as indicated in the study by Binks *et al.* (1992).

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<sup>18</sup> Q3: What are the perceptions of KBBs with respect to chartered bank and government financing and how do they compare with the perceptions of less knowledge-intensive firms?

## **CHAPTER 6**

### **SUPPLY-SIDE FINDINGS**

#### **6.0 Introduction to Supply-Side Findings**

The present study explores the supply-side of lending to knowledge-based businesses in Newfoundland and Labrador by analyzing data obtained from two key groups, senior officials responsible for commercial lending activities by banks and government agencies in the Province, and account managers responsible for reviewing and assessing applications for financial assistance from entrepreneurs. This chapter presents and discusses findings based on that input.

The profile of participants is presented first followed by the discussion of results in the three primary supply-side areas of the study, organizational framework, decision-making process and loan evaluation. Findings, concerning the existence and pervasiveness of a shared lending culture, are presented and discussed in the context of loan evaluation and, more specifically, risk assessment. Comparisons of findings in each of the areas under study are made on the basis of the following a priori groups: account manager type (government and bank), type of plan reviewed (traditional and KBB), and account manager focus (generalist and KBB).

## 6.1 Profile of Participants

As outlined in Chapter 4 on methodology, interviews were conducted with senior managers in six chartered banks<sup>1</sup> and four government agencies<sup>2</sup> during March and April, 2000. In one government department (DITT), two individuals participated in the interview. Given the nature and purpose of these interviews, no background information was collected on the interviewees, except their position in the organization, as previously noted in the methodology chapter.

A total of 23 account managers, 13 in banks and 10 in government agencies, participated in the business plan reviews and semi-structured interviews over the period November 1, 2000 through May 7, 2001. A review of the data obtained from the participants revealed the following profile in terms of years of experience, educational background and related training, and industry sector specialization.

The mean<sup>3</sup> for years of experience in commercial lending and related fields for the overall group was 10, although the range was from one to 27. Although not significant, bank account managers had slightly more years of experience (mean=10.6) than government account managers (mean=9.1). Similarly, those who reviewed the KBB proposal had more years of experience (mean=11.0) than those who reviewed the traditional proposal (mean=8.9) and account managers with a KBB focus had more years of experience (mean=12.9) than the more generalist account managers (mean=9.1). Again, these differences were not significant.

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<sup>1</sup> Participating banks: Bank of Montreal (BMO), Canadian Imperial Bank of Commerce (CIBC), HSBC Bank Canada (HSBC), Royal Bank of Canada (RBC), Scotiabank (SB) and Toronto Dominion Bank (TD)

<sup>2</sup> Participating government agencies: Atlantic Canada Opportunities Agency (ACOA), Business Development Bank of Canada (BDC), Department of Development and Rural Renewal (DDRR) and Department of Industry, Trade and Technology (DITT)

<sup>3</sup> The median for years of experience with the current employer was 5.5 and for years of previous related experience was 0.0.

Eighteen account managers had completed a bachelor's degree and six of these had also completed a graduate degree. While cross tabulations between educational level and various types of account managers revealed no significant differences, it is noteworthy four of the five account managers, with no post-secondary education, were bankers. These five account managers had significantly more experience (mean=17.5 years) but were no more likely to have any additional training. Two of the five were KBB specialists, raising the question of how specialized expertise, required for technology and scientific assessment, is acquired.

A significant percentage (82.6%) of participants had undertaken additional related training, comprised mainly of in-house seminars and short courses. Account managers in banks were more likely (100.0% vs. 60.0%:  $p < .05$ )<sup>4</sup> to have completed such training than were account managers in government agencies. Only three participants, two in government and one banker, had undertaken training specifically related to the knowledge-based sector. In terms of industry sector specialization, 10 account managers focused on specific sectors, eight of which included at least one knowledge-based sector. However, only five account managers, three in government and two in banks, focused primarily on knowledge-based businesses. Table 6.1 provides a summary of account manager participation in the study.

Eleven participants reviewed the more traditional business proposal (Glacier Ice) while the other 12 reviewed the knowledge-based business proposal (TeleCare). One of the modifications made to the data collection process following the pilot was the addition of the question asking account managers to rate the proposal following the initial review<sup>5</sup>. As a result, only 20 account managers, eight in government agencies and 12 in banks, provided ratings at the initial review stage. Initial ratings are based on

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<sup>4</sup> Pearson chi-square = 6.295 (1df)  $p = .012$

<sup>5</sup> The initial review process is outlined in section 4.2.2.2 of Chapter 4 on methodology.

nine reviews of the traditional business proposal and 11 of the KBB proposal. Ratings were obtained at both stages from the five account managers with a KBB focus.

The remainder of this chapter presents and discusses findings from the interviews with senior management and account managers and from the business plan reviews by account managers.

**Table 6.1**  
**Summary of Account Manager Participation**

Participant <sup>6</sup>	Affiliation	Plan Reviewed
GT1**	Government	Glacier Ice
BT2	Bank	Glacier Ice
BT3	Bank	Glacier Ice
GT4	Government	Glacier Ice
GT5	Government.	Glacier Ice
BK6	Bank	TeleCare
GK7**	Government.	TeleCare
GK8*	Government.	TeleCare
BK9	Bank	TeleCare
GK10*	Government.	TeleCare
BK11**	Bank	TeleCare
BK12*	Bank	TeleCare
BT13	Bank	Glacier
BT14	Bank	Glacier
BT15	Bank	Glacier
BT16	Bank	Glacier
GT17	Government	Glacier
BK18	Bank	TeleCare
GK19*	Government	TeleCare
BK20	Bank	TeleCare
BK21*	Bank	TeleCare
GT22	Government	Glacier
GK23	Government	TeleCare

\* denotes account manager with a KBB focus

\*\* denotes account manager participating in the pilot test

<sup>6</sup> G = government account manager, B = bank account manager, T = traditional business plan, and K = knowledge-based business plan.



## **6.2 Organizational Framework of Lending Institutions**

Results of the interviews with senior bank and government officials and with account managers revealed some notable differences between the approaches taken by chartered banks and government agencies to organizational strategies and structures associated with the KBB sector. The following discussion is organized and presented in these two areas: organizational strategies, which includes defining and targeting knowledge-based businesses, and organizational structures, which includes specialized lending units, and recruitment and training of staff.

### **6.2.1 Organizational Strategies**

The definitions of knowledge-based businesses by the institutions studied were diverse. Not all banks had a corporate definition of knowledge-based businesses or knowledge-based industries. Only one bank (B4)<sup>7</sup> subscribed to the definition based on SICs utilized by the Canadian Bankers Association for reporting data on lending to knowledge-based firms. The others provided more qualitative observations on key aspects of KBBs, such as research and development-intensive, export-oriented, and possessing a high percentage of intangible assets. The perspectives also varied from those who viewed KBBs as technology-oriented to those who emphasized dimensions such as innovation and growth. In fact, the terminology associated with KBBs and KBIs ranged from a very broad-based reference to “new economy firms” to terms such as “innovative growth firm” and “emerging market sectors.” Only one government organization (G4) provided a precise definition of a KBB as “... a business that

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<sup>7</sup> Codes are used in places where participants expressed concern for confidentiality.

generates the majority of its revenue from non-fixed assets or soft assets, such as patents and the like."

Interview results indicate there was little agreement on a definition of knowledge-based business or knowledge-based industry. However, there was some agreement on the characteristics exhibited by KBBs. Most agreed that KBBs possess some, if not all, of the following attributes: highly skilled/highly educated workforce, high level of research and development, strong export orientation, high percentage of intangible assets, and products/services with short life expectancies and high gross margins. In addition, KBBs were considered more likely to use and/or develop advanced technologies and to be innovative in their products, services or processes.

None of the banks and only one government agency, the BDC, indicated having a specific statement in their mission or mandate directed to knowledge-based businesses. However, all banks, except HSBC<sup>8</sup>, referred to KBBs on their websites and in promotional literature and offered products/services that were specifically designed to meet the needs of KBBs. One bank (B3) also reported that they communicated their KBI strategy via papers, presentations, bank Intranet, training forums and other communication pieces. Specialized product offerings included tax credit financing, contract financing, and research and development financing. Specialized services offered by the banks appeared to vary by industry sector, frequently involved public and private partnerships, and, in many cases, were designed to improve access to export services and advice<sup>9</sup>.

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<sup>8</sup> HSBC offers Practice and Capital Loans targeted to the needs of professionals, such as doctors, lawyers, dentists and accountants.

<sup>9</sup> One example is an alliance between the Royal Bank of Canada and the BDC targeted to knowledge-based and innovative manufacturers. Under this program, firms have access to financing of up to \$1 million for developing new products or technologies, for market development and for establishing new production and services capacity. Professional advice is also available under this program.

There was also a reference in the mandate of one government agency, the BDC, to supporting the growth of knowledge-based businesses. In addition, all four government agencies made reference to aspects of KBBs on their websites and in their promotional literature. Such references included the following: strategic growth industries, particularly those offering export potential, emerging non-resource based sectors, technology-based firms, innovative technical projects, and innovative, growth-oriented manufacturing and exporting businesses.

The BDC was the only government agency to offer products targeted specifically to KBBs. Interestingly, a number of their programs were delivered in collaboration with the chartered banks<sup>10</sup>. The ACOA also offered a limited range of programs designed for technology-based ventures and made some program adjustments to suit the needs of KBBs. Otherwise, government programs were not targeted specifically to KBBs.

Just as there was considerable variation in the terms used to refer to KBBs, there was also variation in the industry or sectoral focus that each of the banks and government agencies had chosen to pursue. Three banks (BMO, HSBC and TD), and all four government organizations take a more general or non-sectoral approach; although, two of the banks (BMO and TD) appear to place greater emphasis on high technology companies, particularly those operating in areas such as telecommunications and information technology. The other three banks (CIBC, RBC and SB) appeared to be pursuing similar foci in three main areas, namely, information technology, life sciences and health care, and media and entertainment. However, the

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<sup>10</sup> For example, the BDC has an agreement with Toronto Dominion Bank to offer joint loan packages to innovative manufacturing, knowledge-based and export oriented businesses. BDC also have partnered with Bank of Montreal through the Eastern Technology Seed Investment Fund to provide venture capital financing and management support for early-stage technology projects in Eastern Canada.

emphasis given to each of these areas and their subsectors varied among the three banks.

None of the banks reported having specific goals or objectives for knowledge-based sectors, at least not ones that differed from traditional sectors. However, in two cases (B1 and B3) banks employed sector limits designed to ensure that a balance or appropriate mix of industry sectors was maintained. Finally, three banks (B2, B3 and B5) reported that their strategies for dealing with KBBs were evolving and they were presently engaged in restructuring areas of their business that may affect their approach to the KBB market. Only one government organization (G4) indicated having a specific target or goal for KBBs, expressed as a percentage of their total portfolio.

#### **6.2.2 Organizational Structures**

All chartered banks, with the exception of HSBC, had established specialized lending units or centres to service KBBs, although none of these centres were located in Newfoundland and Labrador. The locations of these specialized centres tended to mirror the development of clusters of KBBs in areas such as Ottawa, Markham and Kitchener-Waterloo in Ontario, Calgary in Alberta, Saskatoon in Saskatchewan, and Vancouver in British Columbia. Three banks (BMO, Royal and CIBC) had KBB centres in Halifax, Nova Scotia that provided support to commercial account managers in Newfoundland and Labrador. One bank (B2) also reported having specially trained staff in seven branch locations to support their efforts at servicing innovative growth firms. Again, none of these branches were situated in Newfoundland and Labrador.

Only one government organization, the BDC, had centres catering specifically to the needs of the knowledge-based sector. At the time of the interviews, the BDC

was piloting a program of entrepreneurship centres in 12 areas of the country.<sup>4</sup> The centres, which included St. John's and Halifax, focused on lending to small technology and export-oriented firms. Two other government agencies, DIT and ACOA, employed individuals who devoted their primary attention to technology-based ventures, especially those in the information technology area. Otherwise, government organizations did not maintain structures with a specialized KBB focus.

Account managers with specific KBB responsibility in the chartered banks had been drawn principally from the ranks of experienced commercial lenders and provided with training to enable them to undertake the appropriate risk and technology assessments of KBBs. Training consisted mainly of a combination of in-house sessions supplemented, in some cases, with the use of outside consultants and attendance at various conferences. One bank (B3) reported that their KBI specialists undergo a three-month training program with extensive involvement of an outside consultant and become accredited on successful completion of the program. Two banks indicated a recent trend to hiring individuals with more industry experience and providing them with training in account management. However, they noted this approach was true across the bank and not specific to the KBB area. One bank indicated that they used a mentoring approach to training but again this was true for their training program in general. Similarly, a few banks stressed the use of a team approach to KBB lending with groups meeting frequently to share experiences.

There was wide variation in the recruitment strategies of the various government agencies reflecting the differing mandates of these organizations. However, with the exception of the BDC, they appeared to take a generalist approach emphasizing significant industry experience. They also placed much greater emphasis on the counselling role of staff than did the banks, reflecting their economic

development mandates. The BDC operated more like the chartered banks hiring individuals with lending or venture capital experience. They were also the only government organization engaged in formalized training of account managers. The training was offered twice a year at the BDC head office and involved the use of outside industry experts providing an overview of industry and market trends. The objective was to sensitize account managers to the risk assessment process that needed to be undertaken in the KBB context. The training also appeared to reflect the specialized nature of products and services that the BDC offers to KBBs. Training in the other government agencies, similar to the banks, consisted mainly of in-house sessions supplemented with the use of outside consultants and attendance at various conferences. Except as noted above, training in banks and government agencies did not have a specific KBB focus.

Overall, chartered bank commercial lending in the Province appeared to be a highly centralized and generalist activity. Interviewees indicated that loan evaluation was primarily the responsibility of commercial account managers operating from provincial offices located in St. John's. Branch managers at other locations engage in some small scale commercial lending, largely as part of their broader responsibilities and usually linked to the personal lending side of the business. Only one bank (B3) reported having someone in the Province with designated responsibility for KBB lending, although there was also some evidence of responsibilities being organized along sectoral lines. KBB lending activities of government organizations in the Province varied widely and, except for the BDC, tended to follow more traditional approaches.

### **6.2.3 Organizational Variables and Lending**

In order to determine the impact of organizational variables, such as strategies and structures, on lending decisions, it is necessary to examine the loan evaluation and decision-making processes of account managers. Information from all stages of the review process, in particular the verbal protocols at the initial review stage and follow-up requests by account managers for additional information, are useful to gaining insight into organizational effects.

A review of the transcripts of the verbal protocols provides initial insight into the potential impact of organizational variables on lending decisions at the earliest stage in the review process. A wide variety of factors were mentioned by all account managers during the initial review of the proposals; however, only a few related to organizational framework are noteworthy. The most frequent mentions by bank account managers included minimum equity requirements, required security, especially accounts receivable to support operating loans, and industry sectors and associated standards, most notably debt to equity ratios and gross margins. It was apparent bankers were operating from a fairly structured approach to assessment in each of these areas. In a number of cases, account managers calculated ratios and margins and referred specifically to limits or minimums, such as "... the operating loan can't exceed 10 percent of sales" and "... we will need to see that lower" (referring to the debt to equity ratio).

In other cases, account managers appeared sensitive to the industry sector, noting its importance with respect to policies. To quote one account manager, "I have to check what industry sector this is. I need to know for corporate policy guidance." Overall, the comments by the bank account managers did not differ depending on the

proposal under review (traditional or KBB) and there was little evidence of the influence of either institutional strategy or structure with respect to knowledge-based businesses.

Interestingly, government account managers also referred most frequently to equity requirements during the initial review, in a number of cases noting the requirement for a minimum percentage of total capital costs in order to meet program eligibility criteria. References to industry standards and security were also noted by the government group, although not as frequently as by bankers. In many cases these references reflected concern for the ability of the proponents to access operating credit from the bank. The most notable differences on the part of the government account managers were references to factors such as, competitive impact assessment, employment and export potential. These observations clearly reflected specific organizational strategies and mandates, as well as overall government support for economic development in the Atlantic Region and in the Province. Again, there was no evidence at the initial review stage by government account managers of differences between the KBB proposal and the traditional proposal with respect to organizational variables.

Relatively few account managers noted requirements for additional information during the initial review. Those that did were interested primarily in statements of personal net worth for the owners. One account manager actually made a list of missing information during the review process, and provided the list to the researcher immediately following the review. The list included the following: personal statements of net worth for the owners, financial pro formas covering two additional years, copies of sale and purchase agreements for equipment, copies of the lease and insurance policy for the premises, copies of sales agreements/contracts, and copies of any binding



agreements with unions, if applicable. In all other cases, participants were asked to identify additional information requirements during the due diligence process. Account managers conveyed those requirements to the researcher by mail, fax, e-mail, phone and in-person. Account managers identified a total of 25 items; however, only 12 received five or more mentions and only nine items were mentioned 10 or more times. A review of the results presented in Table 6.2 provides additional insight into the influence of organizational variables, especially policies and procedures, on loan evaluation and decision-making.

**Table 6.2**

**Information Requirements Identified by Account Managers  
n=23**

Nature of Information	n	%
Confirmation of other sources of financing	21	91.3
Statements of personal net worth	16	69.6
Details of market research and marketing strategy	14	60.8
Details of capital costs including supplier quotations	14	60.8
Copies of confirmed orders or sales contracts	13	56.5
Lists of shareholders, officers and directors	12	52.2
More detailed financial statements with sensitivity analysis	12	52.2
Resumes of the principals	10	43.5
Environmental/regulatory/legal clarification	10	43.5
Availability of security, including personal guarantees	7	30.4
Information on key employees	6	26.1
Copy of the lease	5	21.7
Confirmation of distribution agreements	4	17.4
Copy of insurance policy	3	13.0
Copy of union agreements	2	8.7
Identification of economic benefits	2	8.7
Previous bank and contact	1	4.3
Detailed sales breakdown	1	4.3
Competitive assessment	1	4.3
Copies of charter agreements for vessels	1	4.3
Schedule of critical timelines	1	4.3
Identify supplier	1	4.3
Details of technology	1	4.3
Tax returns for owners	1	4.3
Clarification of transportation issue	1	4.3

These results demonstrate a high degree of consistency among account managers regarding critical information requirements. Comparing the government group to the bank group revealed only one key difference: bank account managers were more likely to identify issues and information related to the financial aspects of the proposal, while the government account managers were more likely to identify information requirements related to the technology/production, marketing, and human resource areas. The vast majority of items mentioned less frequently appeared to be specific to the proposal under review and involved points of clarification and requests for elaboration. The consistency reflected in the items identified suggests the due diligence process is highly standardized, with account managers operating under structured guidelines. The difference in emphasis on the part of the government group compared to the bankers likely reflects the difference in mandates between the two groups discussed previously. No significant differences were found in information requested by those who reviewed the KBB proposal compared to those who reviewed the traditional proposal, indicating the presence of standardized policies and procedures regardless of the nature of the venture.

Overall, findings from the initial review of the proposals and subsequent due diligence indicate organizational variables help to explain differences in approach between account managers in banks and those in government but there is no evidence to indicate differential effects on loan evaluation and decision-making in the context of knowledge-based firms. As a result, in response to research question Q4<sup>11</sup>, it is possible to conclude that loan evaluation and decision-making are affected by organizational variables but the effects do not appear to be different for knowledge-based firms compared to less knowledge-intensive firms.

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<sup>11</sup> Q4: Are loan evaluation and decision-making affected by organizational variables and are the effects different for knowledge-based firms compared to less knowledge-intensive firms?

### 6.3 Decision-Making Process

In addition to strategic and structural approaches taken to serve the KBB market, the study also examined the decision-making processes of account managers and, in particular, their information acquisition strategies and use of internal and external support.

To explore the nature, extent and utilization of support for decision-making, account managers were asked to indicate both internal and external sources of information and assistance available and used, or referenced, as part of their business plan reviews. Results presented in Table 6.3 indicate account managers used or consulted an average of 3.00 internal sources of support and 2.13 external sources. While there were no significant differences between the various a priori groups based on t-tests for equality of means, three findings are noteworthy: government account managers consulted more external sources than bankers; account managers who reviewed the KBB proposal consulted fewer internal sources than those who reviewed

**Table 6.3**

**Internal and External Sources of Information and Support  
Used/Consulted by Account Managers**

Account Manager Group	Internal Sources		External Sources	
	n	Mean	n	Mean
All	23	3.00	23	2.13
Banks	13	3.00	13	1.77
Government	10	3.00	10	2.60
Traditional plan	11	3.27	11	2.36
KBB plan	12	2.41	12	2.33
KBB focus	5	1.80	5	2.60
Generalist	18	3.33	18	2.00

the traditional plan; and account managers with a KBB focus consulted fewer internal sources and more external sources than the more generalist account managers.

Types of internal support used were grouped into four primary categories as follows: colleagues in the same branch, office or department, including superiors; staff in other departments, branches or offices; internal databases, files, libraries and Intranets; and policies and procedures manuals. As indicated in Table 6.4, the vast majority of account managers (90.1%) turned to their colleagues for advice and support. In fact, there was evidence of a team-based approach to risk assessment in government agencies and banks. In a few cases, the level of consultation appeared to be dictated by policy. However, in the majority of cases, account managers appeared to consult because they needed specific advice, because they lacked confidence in dealing with certain aspects of the proposals or because this was a natural part of a team-based effort.

**Table 6.4**

**Types of Internal Support Used/Consulted by Account Managers  
(n=22)<sup>12</sup>**

<b>Category of Support</b>	<b>Number of Account Managers</b>	<b>Percent</b>
Colleagues	20	90.1
Staff in other locations	13	59.1
Databases, files, library and Intranet	13	59.1
Policies and procedures manuals	4	18.2
Other	1	4.5

The majority of account managers also relied on expertise available from staff in other departments, branches or offices (59.1%), and on a host of internal support systems that included customer files and databases, and in a few cases a resource

<sup>12</sup> One account manager did not consult/utilize any internal sources.

library (59.1%). One bank (B2) indicated using a process in several designated branches (none were located in Newfoundland and Labrador) involving a credit adjudication partnership between account managers in branches and credit specialists in a central credit division. A qualified consultant was also available in these branches to assist account managers with analyzing and structuring deals. The main purpose of this approach was to ensure good quality applicants were not turned away because of lender bias. Bank account managers in specialized lending centres were also provided with support, such as head office industry expertise and research, not widely available to those in traditional lending areas. Five of the banks also had an Intranet in place to facilitate access to information, such as corporate policies and directives. However, only four account managers referred specifically to policies and procedures manuals as part of their decision-making processes, indicating either they were very familiar with the guidelines or they did not consider them to be a source of information and support.

Government account managers and bankers were equally likely to consult with colleagues. However, bankers, especially those who reviewed the KBB proposal, were more likely to utilize other staff resources in bank departments such as credit, risk management, national accounts, and KBB centres for specialized expertise.

Government account managers relied primarily on other government departments to provide specialized assistance and advice. With the exception of the BDC, individual government departments did not appear to be as well served with internal resources, such as databases and Intranets, as the banks. However, this may be the result of the consolidation within the Provincial Government of similar information and support through the establishment of the Canada Newfoundland and Labrador Business Service

Network (CNLBSN)<sup>13</sup> and the Success Works database<sup>14</sup>.

Types of external support and information available to and utilized by account managers were considerably more varied than internal sources, although the Internet was mentioned most frequently by both bankers and government participants as a source of industry and market data (Table 6.5). The most notable difference between the two groups in terms of external sources was the significantly greater use of both Robert Morris Associates<sup>15</sup> credit information and credit bureau checks by bank account managers. Account managers in both groups were equally likely to turn to industry associations for information and also indicated they would normally contact potential customers with the client's permission.

**Table 6.5**

**Types of External Support Used/Consulted by Account Managers  
(n=22)<sup>16</sup>**

<b>Category of Support</b>	<b>Number of Account Managers</b>	<b>Percent</b>
Internet	14	63.6
Industry associations	6	27.3
External experts and consultants	6	27.3
Robert Morris Associates	5	22.7
Credit bureau	4	18.2
Other	4	18.2

<sup>13</sup> CNLBSN is a province-wide support network providing a full service lending library and information research assistance.

<sup>14</sup> The Success Works database, developed by the Department of Industry, Trade and Technology, includes information specific to business analysis, industry support, trade, and industrial benefits.

<sup>15</sup> In June, 2000 Robert Morris Associates changed its name to RMA – The Risk Management Association. RMA is a financial services trade association that provides member financial institutions with a variety of risk management services, including credit risk information, research and training.

<sup>16</sup> One bank account manager did not undertake any external due diligence indicating they “didn’t feel there was a deal here to warrant the effort.”

It is worth noting three government agencies made provisions to hire outside experts to assist with evaluation by conducting market research or even fine tuning the business plan for clients. Two banks also reported using external expertise extensively to validate the strength of some of the business plans and technologies, although this was not done for the present experiment. Bank use of external consultants was also mentioned in the context of specialized lending and KBB centres.

The government organizations also reported working fairly closely together, sometimes partnering on deals and sometimes relying on each other for expertise. As mentioned previously, partnerships had also been established between a number of banks and the BDC. Other than the potential use of outside consultants, there were no apparent differences between sources of external support used by those who reviewed the KBB proposal and sources used by those who reviewed the more traditional proposal.

Finally, on a more informal level, it appeared as though both groups of account managers used their internal and external connections and contacts to access required expertise and experience in dealing with the specific industry sectors. For example, one account manager indicated he knew someone at the Telemedicine Centre at Memorial University of Newfoundland who he could call upon for background and expertise in the telemedicine area. A second account manager mentioned a current client that could be helpful in assessing the technology associated with harvesting glacier ice. While a third account manager indicated she consulted with her spouse for input on the concept.

In summary, results indicate three notable differences between bankers and government account managers in terms of information acquisition to support loan evaluation and risk assessment. First, government account managers consulted more

external sources of support. Although the difference was not significant, this finding may indicate the internal support network available to account managers in government is not as strong as that available to bankers, necessitating greater reliance on external sources of assistance. Second, support for this finding is also provided by the fact that the bankers in this study, especially the ones who reviewed the KBB proposal, were more likely to utilize other staff resources in the bank, including expertise in credit and risk management departments and KBB centres. Third, bank account managers emphasized credit information and credit checks more than the government group, with five account managers specifically referring to data from Robert Morris Associates.

A number of findings are noteworthy in the context of lending to knowledge-based businesses. In theory, support available to account managers, both internally and externally, should address differences in the skills and knowledge needed to assess applications from knowledge-based firms. The banks, in particular, provide access to internal information and expertise specifically designed to facilitate loan evaluation and risk assessment of KBBs. In addition, the banks and government agencies make provision for the use of external consultants to assess business proposals and associated technologies. Nonetheless, in practice, this study found limited evidence of differences in approaches used by account managers when assessing the KBB proposal. Findings indicate this group consulted fewer internal sources, while the subgroup, comprised of account managers with a KBB focus, also consulted fewer internal sources but used more external sources. In both cases, the differences were not significant. Further, as indicated previously, bankers who reviewed the KBB proposal were more likely to use other staff resources in specialized departments. Finally, other than the potential use of outside consultants, there were no apparent differences between the types of external



support used by those reviewing the KBB proposal and the types of external support used by those reviewing the more traditional proposal.

In terms of research question Q5<sup>17</sup>, findings indicate government account managers rely more on external sources of support when making lending decisions to knowledge-based businesses. Bankers, on the other hand, are more likely to rely on their extensive internal network of information and expertise. Both groups have access to specialized expertise in the form of external consultants; however, the present study was not able to assess the extent to which that support is used in loan evaluation and risk assessment, either generally or specifically related to KBBs.

#### **6.4 Loan Evaluation**

The third and final supply-side component of the lending decision, examined in the present study, is loan evaluation. As indicated previously, loan evaluation is comprised of risk assessment, estimating borrower's needs, and loan structuring and management. The discussion of exploratory findings concerning loan evaluation integrates these components and addresses elements of both process and content.

##### **6.4.1 The Loan Evaluation Process and the Lending Decision**

In terms of process, all banks reported making some modifications to traditional risk assessment when evaluating loan applications from knowledge-based firms. In some cases, the approach consisted of little more than placing increased emphasis on

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<sup>17</sup> Q5: What are the information acquisition strategies employed by account managers to support credit decision-making and are there differences between the information acquisition strategies used by account managers in making lending decisions to knowledge-based businesses compared to less knowledge-intensive firms?

cash flow, management and market potential in lieu of tangible security. However, three banks (B1, B2, and B3) indicated having developed proprietary risk assessment models for use in KBB loan evaluation and decision making. The models were developed after extensive research and consultation with universities, technology centres and private companies. The approaches varied but generally consisted of refining conventional risk assessment models to evaluate firms with few tangible assets and of collateralizing loans on the basis of traditional intellectual property, such as patents. Overall, the due diligence process was purported to be much more extensive in the case of lending to KBBs.

The risk assessment processes employed by the government agencies were also purported to be more stringent and complex for KBBs than for traditional firms, reflecting the increased risk associated with the lack of tangible security. However, interviewees indicated the same basic due diligence process was followed in all cases. As well, only one of the government participants indicated using risk assessment tools developed specifically for KBBs.

There were marked differences between government account managers and bankers in terms of their decisions and recommendations concerning financial support. Six government account managers were prepared to recommend financial assistance consisting of a variety of packages, including term loans, working capital loans, cost-shared marketing assistance, third party consulting and counselling assistance, and direct equity contributions. The latter took the form of matching support. In addition, two government account managers were prepared to recommend indirect financial assistance, consisting of a tax holiday from provincial corporate income tax, health and post-secondary education tax and retail sales tax. One of the government group required more information before making a recommendation and another recommended

against providing financial assistance. Interestingly, the latter two account managers were with the same organization (G4).

Notwithstanding the willingness on the part of some individuals to provide various types and amounts of financial support, all government account managers were quick to point out that obtaining operating credit facilities from a bank was essential and could pose a major obstacle to start-up. In the vast majority of cases, government assistance was predicated on other financing being in place with disbursements being made accordingly. In almost all cases, the government account managers indicated a willingness to provide counselling assistance, either themselves or from other departmental staff. This assistance was intended to improve aspects of the proposal and in some cases, to address specific information gaps, most notably, market research.

The bank account managers were less enthusiastic about providing financing than their counterparts in government with only two of 13 willing to provide a term loan to support the purchase of equipment and only one prepared to recommend an operating line of credit to cover working capital requirements. In both cases, the term loans would be provided under the Canada Small Business Financing Act, which carries a federal government guarantee of 85 percent. Meanwhile, the operating line would be limited to \$450,000, far short of the required amount. Two bankers also made a point of mentioning that the best they could provide at this point in time was value-added advice. The offers of advice by the bank account managers were intended to cultivate a longer-term relationship with the client that could lead to potential future business, compared to the offers of advice by government account managers that were designed to enhance the likelihood of obtaining financing in the short term.

For the bankers, willingness to provide financial support appeared to be unrelated to the type of proposal reviewed, traditional or knowledge-based. The

government account managers, on the other hand, appeared to be more supportive of the KBB proposal. For both groups of account managers, the type of firm did not appear to influence recommendations as to the nature and amount of financing and associated terms and conditions. Given the few cases where bank account managers were prepared to recommend a loan, it was not possible to address research question Q7<sup>18</sup> concerning differences in the terms, conditions and monitoring of loans made to KBBs compared to traditional firms.

The data did permit analysis concerning Q8<sup>19</sup> and differences between lending decisions of banks and government agencies. Findings support the conclusion that the government agencies are more supportive of providing assistance to both types of firms than are the banks. However, preliminary analysis indicates these differences appear to be explained by differences in overall mandates and types of support available and not by differences in institutional structures and processes, even though such differences exist. Further, the type of firm, KBB or traditional, did not appear to be a factor in explaining differences between the two groups in terms of lending decisions and recommendations. The preference by government account managers to support the knowledge-based firm compared to the more traditional venture also appears to be related to mandate, since the KBB proposal fits well with the emphasis being placed by government on innovative growth sectors with significant export potential.

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<sup>18</sup> Q7: Do chartered banks attach different terms and conditions to loans made to knowledge-based businesses than to those made to less knowledge-intensive firms and are there differences between the loan monitoring processes employed for knowledge-based firms and those used for less knowledge-intensive businesses?

<sup>19</sup> Q8: Are there differences between lending decisions of chartered banks and lending decisions of government agencies? If differences exist, to what extent can they be explained by differences in institutional structures, loan evaluation and decision-making processes?

#### **6.4.2 Risk Assessment and Lending Culture**

The findings reported previously in section 6.2 of this chapter, as well as the literature on commercial lending, indicate the commercial lending process is highly standardized with account managers following structured guidelines, policies and procedures. This appears to be the case regardless of the nature of the proposal under review. Although there were differences in emphasis noted between account managers in government agencies and chartered banks, the loan evaluation process appears to be highly structured in both types of organizations. As a result, it is reasonable to expect a high level of agreement among bank account managers and among government account managers in terms of risk assessment.

To explore the nature and extent of agreement among various groups of account managers, the present study utilizes consensus analysis. The approach taken is to examine content, as well as process, to determine the relative importance of the factors underlying loan evaluation and risk assessment and to explore the existence of a shared lending culture. Risk assessment and lending culture are examined at two stages in the loan evaluation process: at the initial review stage based on account managers' ratings of the business proposals, and at the post review stage based on account managers' proposal ratings, risk ratings and related concerns.

Account managers conducted their initial review and provided assessments without using formal evaluation instruments and without the benefit of the full due diligence process. Risk assessment, as reflected in their proposal ratings at this stage, is more likely to indicate initial reactions and perceptions, presumably based on previous experience and preconceptions. On that basis, it is unlikely that a high level of agreement or consensus will emerge at this stage in the process. At the post review stage, account managers provided feedback based on a much more complete

assessment of the proposals, following the full due diligence process. As a result, there is more likely to be a higher level of agreement and potentially consensus at the post review stage.

Given the considerable volume of data and analyses concerning risk assessment and lending culture, results are presented for each stage (initial and post review) followed by discussion of the findings as they relate to the specified research questions. Comparisons to a priori groupings are made where appropriate. In addition, the analyses include comparisons between the two stages.

#### **6.4.2.1 Risk Assessment and Lending Culture at the Initial Review Stage**

As a first step in assessing the existence of a shared lending culture, data from the initial ratings of the proposals were analyzed using consensus analysis software available in ANTIROPAC<sup>20</sup> (Borgatti, 1996a). Results of the consensus analysis for all respondents at the initial review stage are presented in Table 6.6. According to Borgatti (1996b), the presence of two large eigenvalues is strong evidence of more than one culturally correct pattern of responses. A ratio of less than 3 to 1 between the eigenvalues for the first two factors indicates the assumption of one culture does not hold.

An examination of Table 6.6 indicates the data resemble the pattern of weak agreement identified by Caulkins and Hyatt (1999). The ratio between the first and second eigenvalues is less than three-times, indicating no clear common culture of lending. The first factor explains a majority of the variance and “a plot of the eigenvalues shows an ‘elbow’ between the first and second factors, flattening out

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<sup>20</sup> In performing consensus analysis, the ANTIROPOAC program creates and factor analyzes a matrix of agreement among respondents.

between the second and third factors” (Caulkins and Hyatt, 1999; 15), results consistent with a pattern of weak agreement.

**Table 6.6**  
**Consensus Analysis – Initial Review**  
**All Account Managers**  
**(n=20)**

Factor	Eigenvalue	Percent	Cum. %	Ratio
1	7.120	56.9	56.9	2.199
2	3.327	25.9	82.8	1.502
3	2.156	17.2	100.0	
Total	12.513	100.0		

Mean Knowledge Score - .547      Respondent Reliability<sup>21</sup> - .896

A review of the knowledge scores<sup>22</sup> generated by ANTHROPAC for respondents (Table 6.7) reveals one account manager had a negative cultural knowledge score. According to Caulkins and Hyatt (1999), the existence of a negative cultural knowledge score indicates an individual holds a very dissimilar view of the domain in question, likely the result of a very different set of experiences. Further examination of the data revealed this account manager was significantly more positive than the group on most aspects of the proposal but more negative on others. Analysis provided no explanation for the negative knowledge score. Following Caulkins and Hyatt’s (1999) treatment of such an outlier, data for this account manager were omitted

<sup>21</sup> Respondent reliability is a measure of the average amount of agreement among respondents computed by calculating Cronbach’s alpha on the person-by-person agreement matrix.

<sup>22</sup> Knowledge scores indicate the percentage of culturally correct responses for each respondent. They are computed by comparing each respondent’s answers to the culturally correct answer as determined by the group consensus.

from subsequent analysis at the initial review stage, thereby permitting a closer and more focused examination of the remaining account managers.

**Table 6.7**

**Knowledge Scores of Account Managers – Initial Review Stage**

<b>Participant</b>	<b>Knowledge Score</b>
BT2	.20
BT3	.71
GT4	.29
GT5	.60
BK6	.46
<b>GK8</b>	<b>-.09</b>
BK9	.61
GK10	.57
BK12	.79
BT13	.72
BT14	.62
BT15	.64
BT16	.65
GT17	.45
BK18	.61
GK19	.75
BK20	.90
BK21	.15
GT22	.58
GK23	.72

At the second stage of analysis, the initial review data were analyzed using non-metric multi-dimensional scaling. MDS provides a visual representation of the pattern of similarities or distances among a set of objects that can be scanned at a glance (Borgatti, 1996b). According to Borgatti (1996b) euclidean distances<sup>23</sup> are typically computed instead of correlations when comparing profiles of respondents across

<sup>23</sup> Euclidean distance is the square root of the sum of the squared differences between corresponding elements of two vectors, where a vector is a row consisting of *n* numbers or variables.

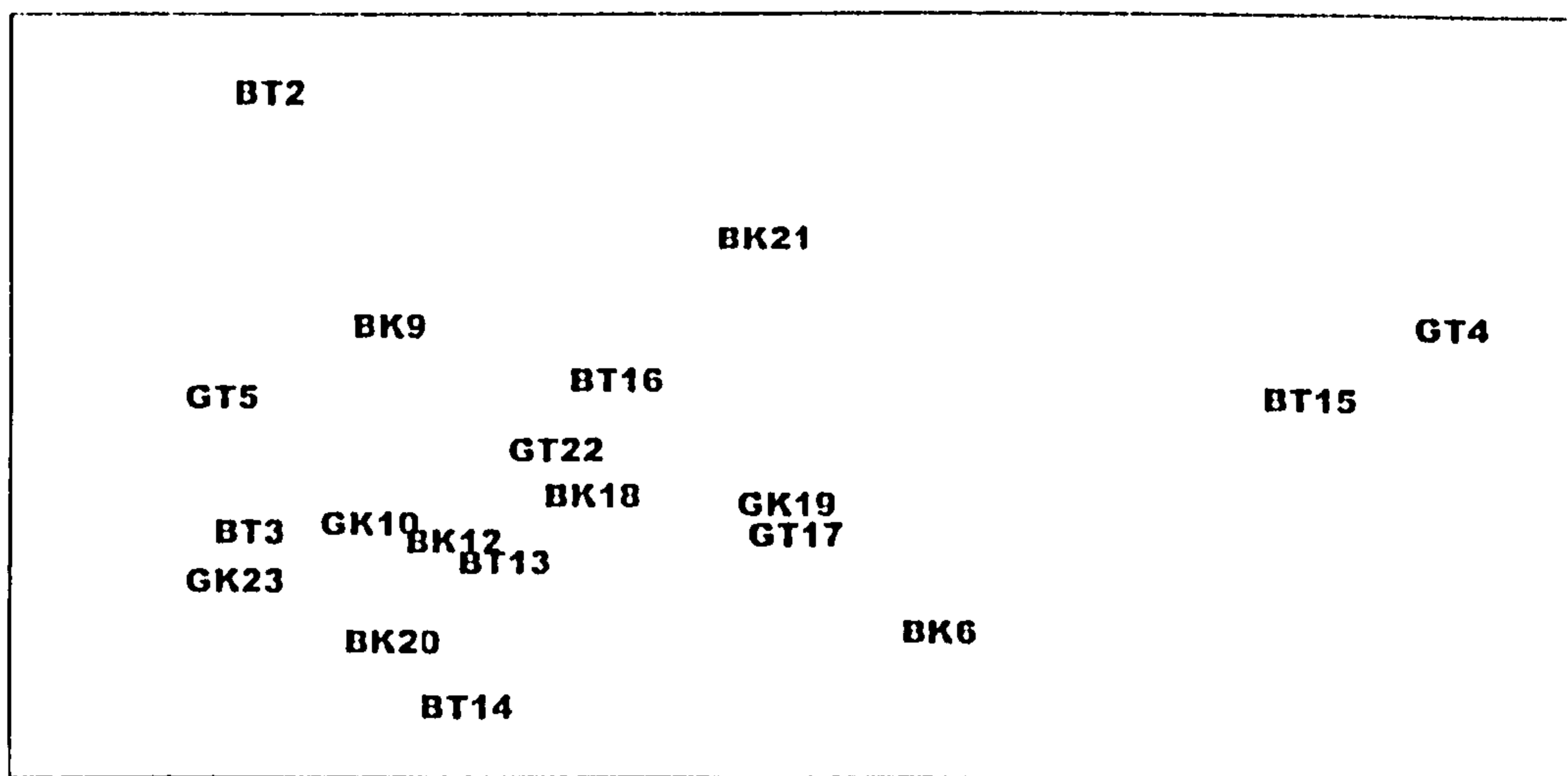


variables. As the interest here is in comparing patterns of responses among account managers, euclidean distance was selected as input to MDS. Results of the MDS for the initial review are presented in Figure 6.1.

Given the high stress level<sup>24</sup> noted in the MDS diagram, hierarchical clustering was employed to examine the grouping patterns in greater detail. The cluster diagram (Figure 6.2) reinforces the results of the MDS, revealing two small but dominant clusters of account managers.<sup>25</sup> Taken together these groupings are consistent with the results of the CA that pointed to a single factor explaining the majority (56.9%) of the

**Figure 6.1**

**Multidimensional Scaling - Initial Review  
All Account Managers**



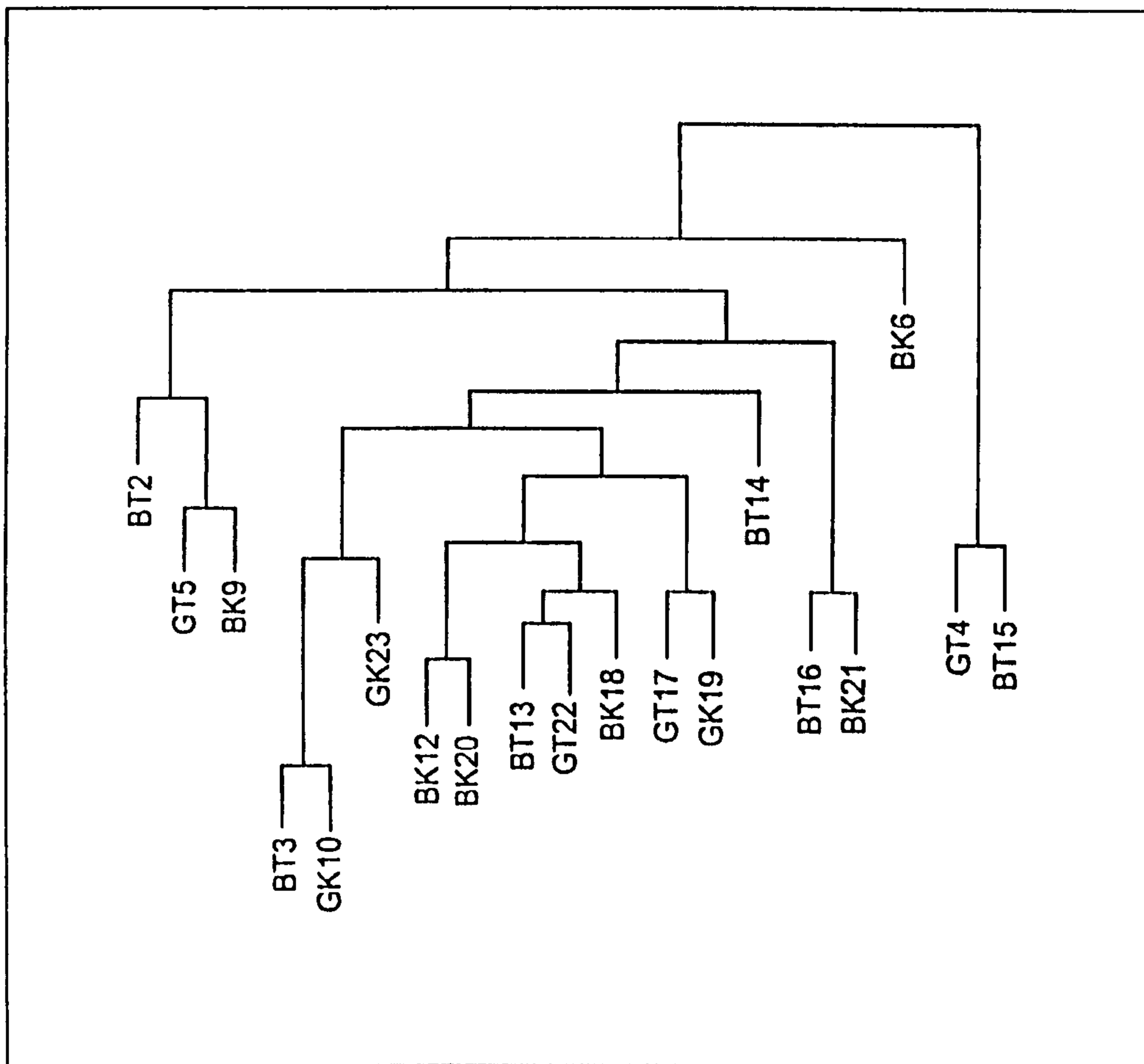
Stress in 2 dimensions is 0.165

<sup>24</sup> The stress level is an indication of how well the MDS map reproduces and represents the input data. The smaller the stress level, the better the representation. According to Borgatti (1996b), a stress level under 0.1 is excellent and over 0.15 is unacceptable.

<sup>25</sup> One group consists of BK12, BK20, BT13, GT22, BK18, GT17, and GK19, while the second is comprised of BT3, GK10, and GK23.

variance, even though not representing consensus. The makeup of these groups is also noteworthy in that they are comprised of a mix of account managers from banks and from government agencies and a mix of those who reviewed the traditional plan and those who reviewed the KBB plan, although the latter group is slightly more dominant. The lack of agreement among the overall group at this stage is not surprising given the diversity of organizations and the fact that not all account managers reviewed the same proposal.

**Figure 6.2**  
**Hierarchical Clustering<sup>26</sup> - Initial Review**  
**All Account Managers**



<sup>26</sup> Based on Agglomerative Hierarchical Clustering Average Linkage Method.

At a third stage of analysis, the initial review data were segmented into a priori groups of account managers as indicated previously: account manager type (government and bank), type of plan reviewed (traditional and KBB), and account manager focus (generalist and KBB). Each of these groups was subjected to consensus analysis to determine whether new patterns of agreement or disagreement emerged. Non-metric multidimensional scaling was used to display consensus patterns. An examination of the data for the government account managers (Table 6.8) reveals a lack of consensus, most closely resembling a case of weak agreement with some evidence of subcultural groupings.

**Table 6.8**  
**Consensus Analysis – Initial Review**  
**Government Account Managers**  
**(n=7)**

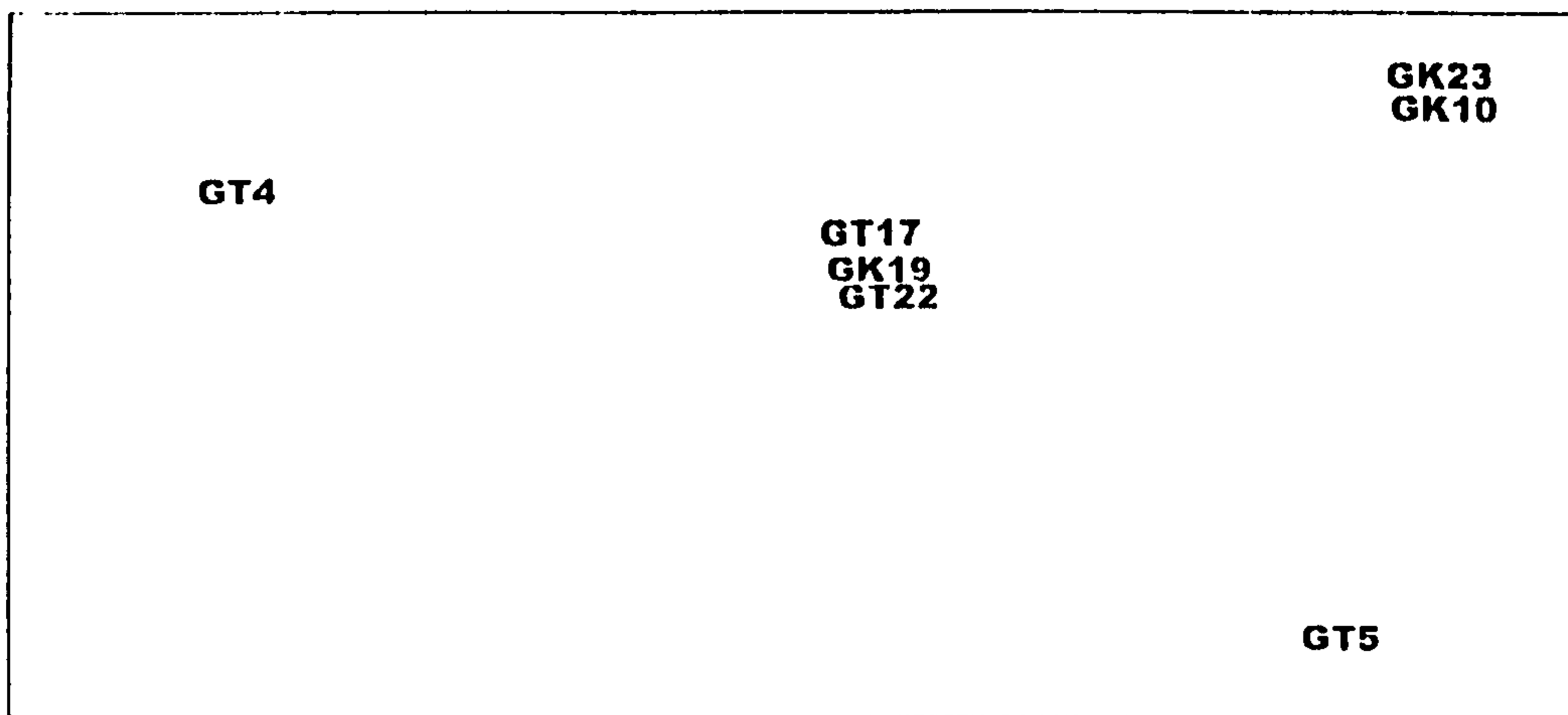
<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	2.315	44.8	44.8	1.536
2	1.507	29.2	74.0	1.125
3	1.340	26.0	100.0	
Total	5.162	100.0		

Mean Knowledge Score - .508

Respondent Reliability - .706

The pattern of weak agreement and two small subgroups of account managers are evident on examination of the MDS diagram presented in Figure 6.3.

**Figure 6.3**  
**Multidimensional Scaling - Initial Review**  
**Government Account Managers**



Stress in 2 dimensions is 0.006

As can be seen in Table 6.9 and Figure 6.4, the bank account managers at this stage also display a lack of consensus. As with the government group, the bankers show signs of weak agreement, but in their case, tending more toward a turbulent domain.

**Table 6.9**  
**Consensus Analysis – Initial Review**  
**Bank Account Managers**  
**(n=12)**

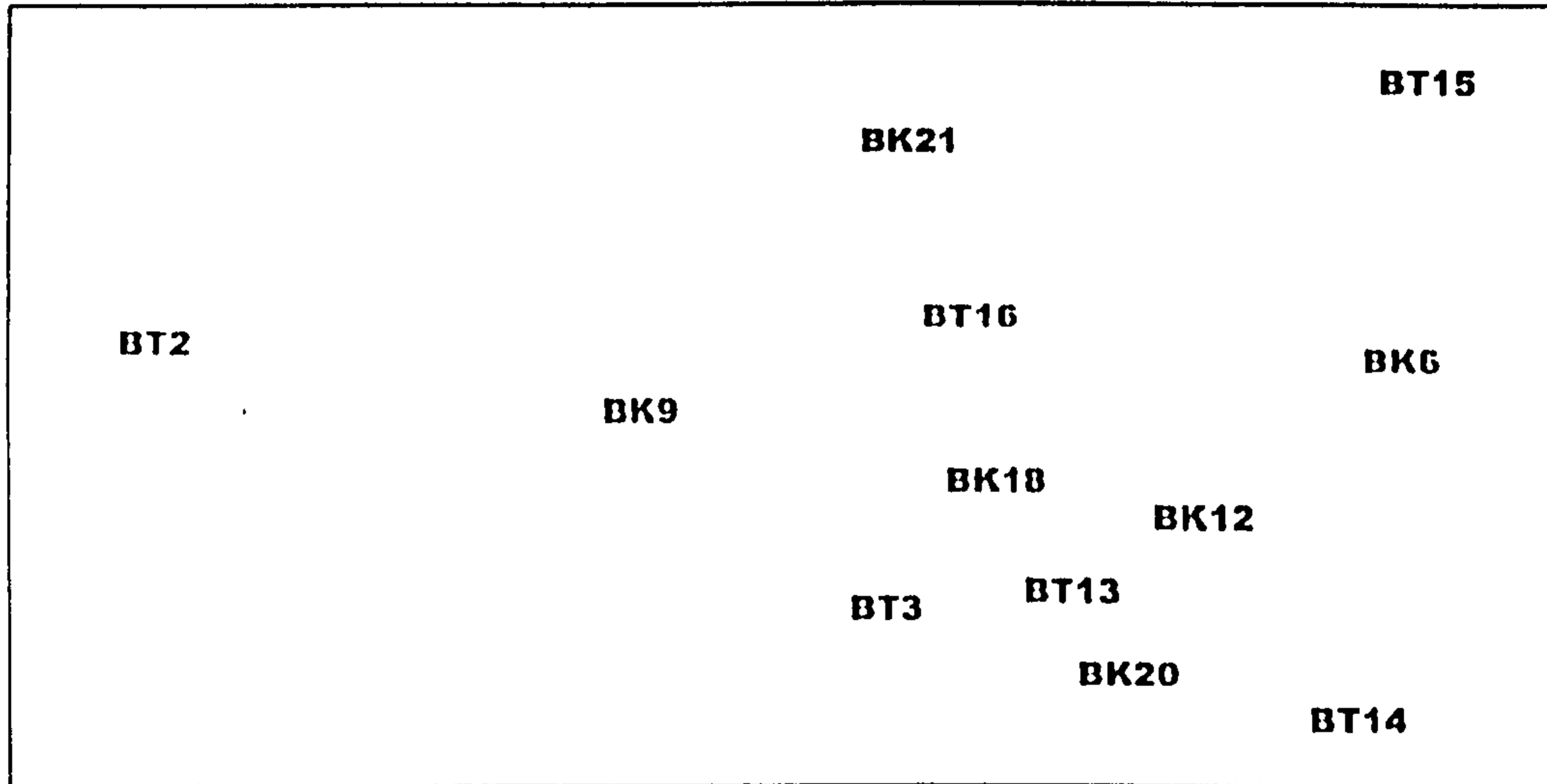
<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	4.579	50.5	50.5	1.678
2	2.728	30.1	80.5	1.543
3	1.768	19.5	100.0	
Total	9.075	100.0		

Mean Knowledge Score - .579

Respondent Reliability - .859

**Figure 6.4**

**Multidimensional Scaling - Initial Review  
Bank Account Managers**



Stress in 2 dimensions is 0.147

The analysis of the data by type of proposal suggests a lack of consensus among the group that reviewed the traditional proposal (Table 6.10), as indicated by the eigenvalue ratio of 1.494. Further, the straight-line descending plot of eigenvalues is an indication of considerable heterogeneity. The pattern of agreement, or more

**Table 6.10**

**Consensus Analysis – Initial Review  
Traditional Business Plan  
(n=10)**

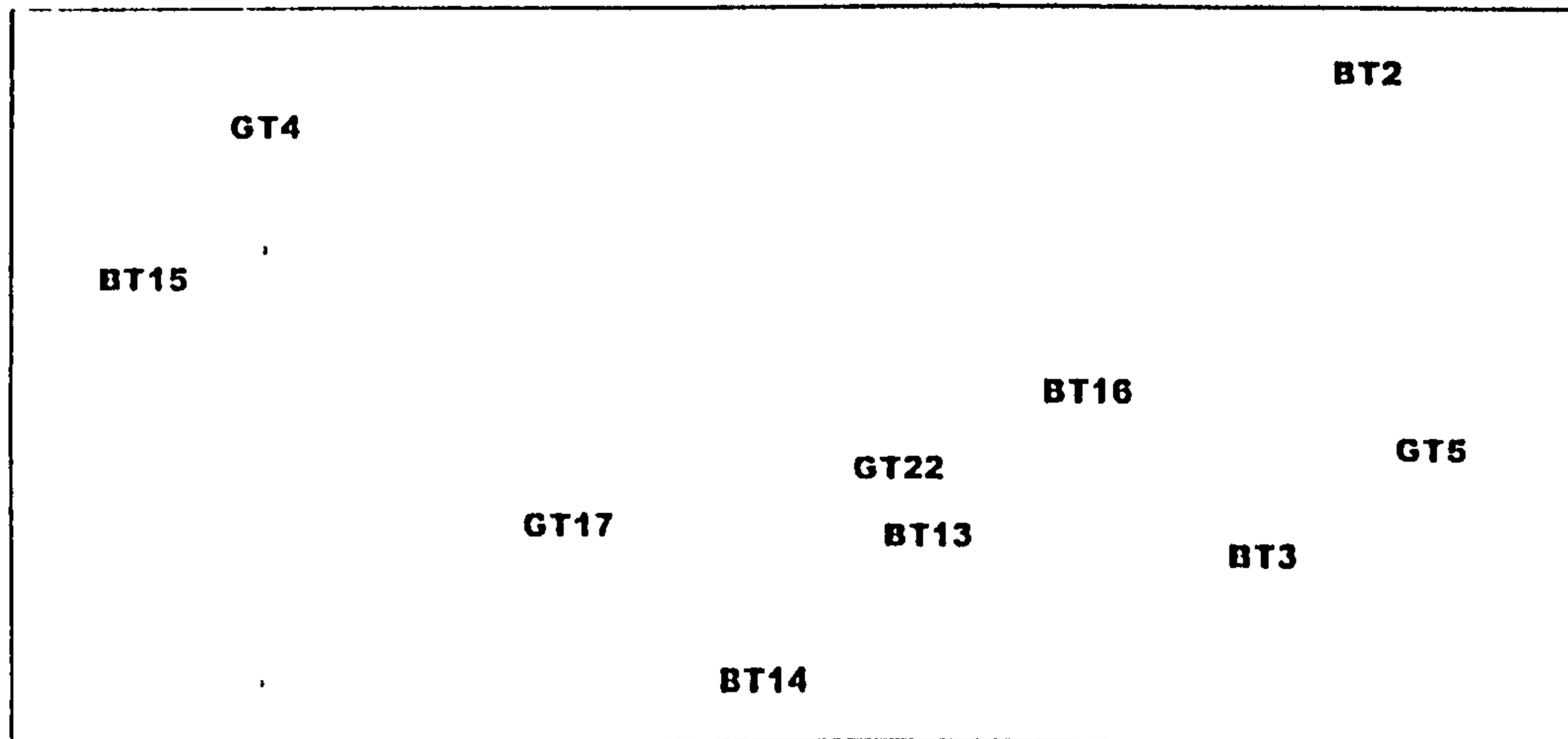
<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	3.382	50.0	50.0	1.494
2	2.264	33.4	83.4	2.016
3	1.123	16.6	100.0	
Total	6.769	100.0		

Mean Knowledge Score - .553

Respondent Reliability - .807

4

**Figure 6.5**  
**Multidimensional Scaling - Initial Review**  
**Traditional Business Proposal**



Stress in 2 dimensions is 0.046

appropriately disagreement, among members of this group is presented in Figure 6.5 and clearly resembles the turbulent domain described by Caulkins and Hyatt (1999).

A very different picture emerged from the review of the data for the account managers that reviewed the knowledge-based business proposal. There is evidence of a high level of agreement among account managers in this group as indicated by the ratio of 3.687 between the eigenvalues for the first and second factors and by the fact that the first factor accounts for 68.1 percent of the variance (Table 6.11). It is also noteworthy that the mean knowledge score for this group is noticeably higher, and in some cases significantly higher, than for the other groups.

**Table 6.11**

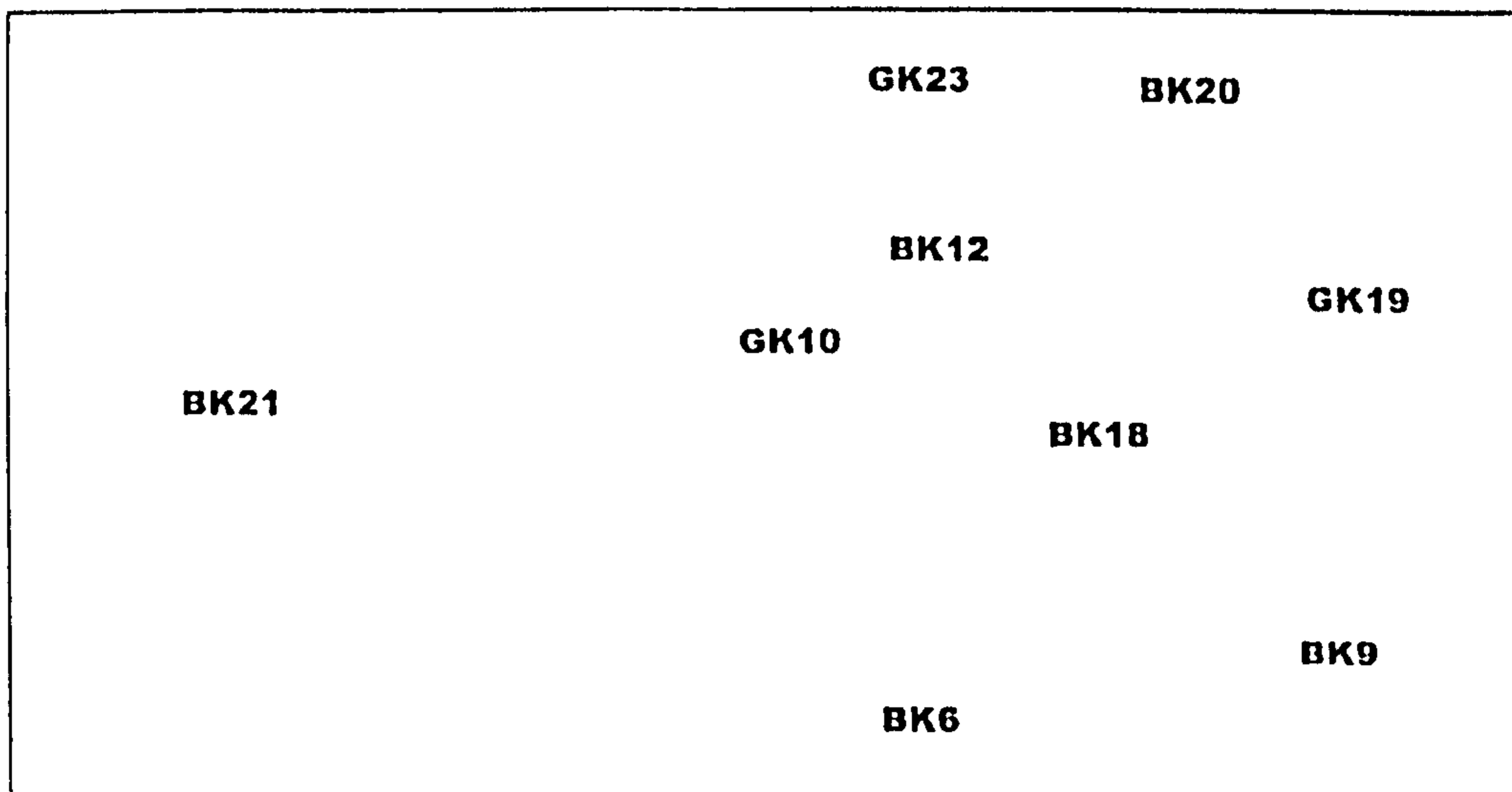
**Consensus Analysis – Initial Review  
Knowledge-Based Business Plan  
(n=9)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	3.829	68.1	68.1	3.687
2	1.039	18.5	86.6	1.381
3	0.752	13.4	100.0	
Total	5.620	100.0		

Mean Knowledge Score - .623      Respondent Reliability - .849

The clustering among members of this group is quite noticeable in the MDS diagram (Figure 6.6) and supports the finding of consensus. Once again, the primary cluster is comprised of a mix of government and bank account managers.

**Figure 6.6**  
**Multidimensional Scaling - Initial Review**  
**Knowledge-Based Business Proposal**



Stress in 2 dimensions is 0.101

A review of the CA results for account managers with a KBB focus (Table 6.12) also indicates consensus, as evidenced by the ratio of 4.587 between the eigenvalues of the first two factors and by the fact that the first factor accounts for a very high percentage of the variance (82.1%). Even though Weller and Romney (1988) provide support for using CA with small groups, a note of caution is in order given the relatively small size of this particular group. Consequently, the MDS diagram has not been included.

**Table 6.12**  
**Consensus Analysis – Initial Review**  
**Account Managers with a KBB Focus**  
**(n=4)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	1.426	82.1	82.1	4.587
2	0.311	17.9	100.0	
Total	1.737	100.0		

Mean Knowledge Score - .574      Respondent Reliability - .653

Analysis of the final group, account managers with a non-KBB focus, indicates another non-consensus and weak agreement domain that, much like the bankers, tends more towards a turbulent domain exhibiting considerable diversity (Table 6.13).



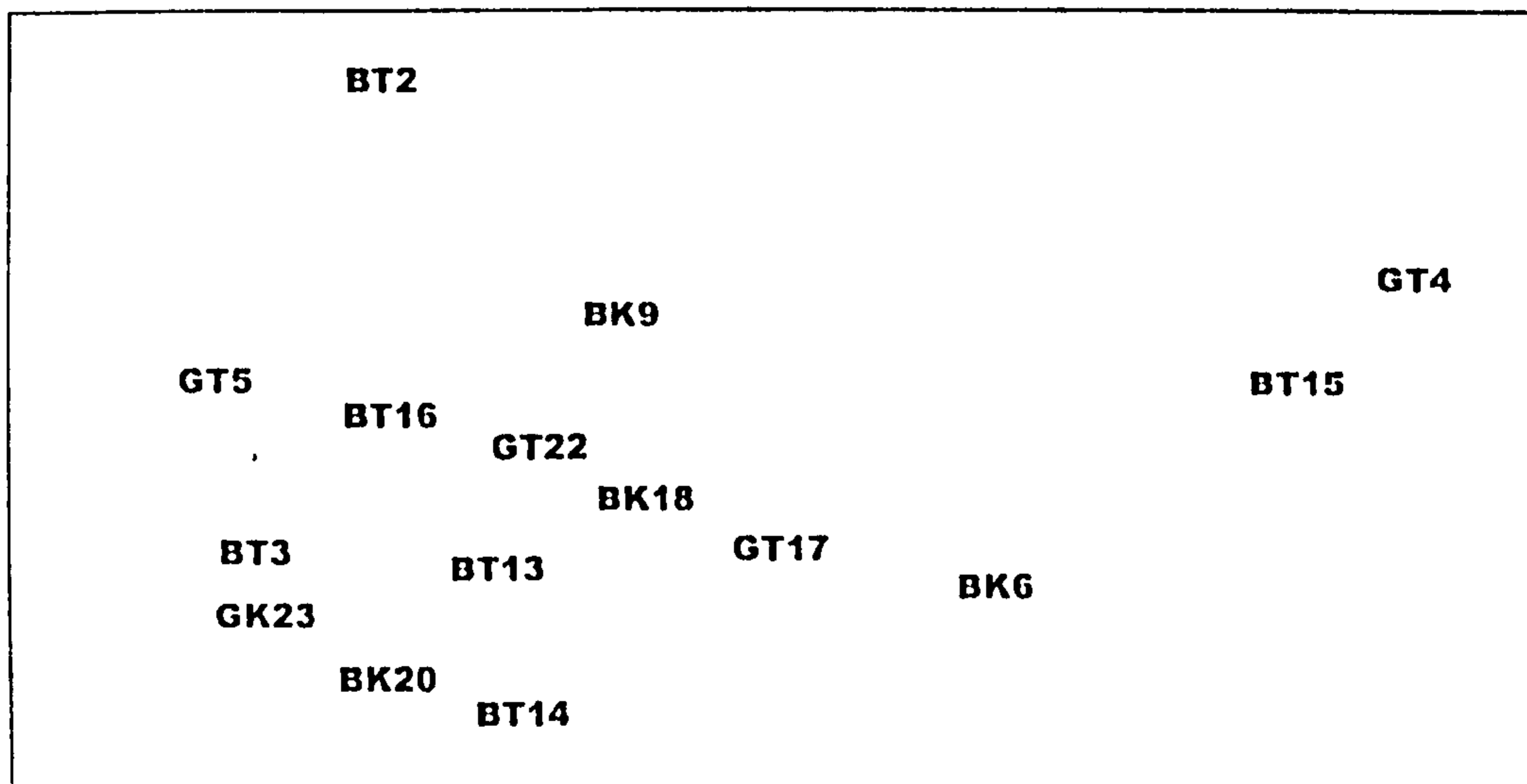
**Table 6.13**  
**Consensus Analysis – Initial Review**  
**Account Managers with a Non-KBB Focus**  
**(n=15)**

Factor	Eigenvalue	Percent	Cum. %	Ratio
1	5.564	57.4	57.4	2.100
2	2.649	27.3	84.6	1.788
3	1.482	15.3	100.0	
Total	9.695	100.0		

Mean Knowledge Score - .590      Respondent Reliability - .888

The lack of agreement among the members of this group is clearly visible in the pattern displayed in the MDS diagram (Figure 6.7).

**Figure 6.7**  
**Multidimensional Scaling - Initial Review**  
**Account Managers with a Non-KBB Focus**



Stress in 2 dimensions is 0.136

One additional output from consensus analysis that is useful to the present study is the culturally correct response key or answer key generated by ANTIROPAC. The predicted answer keys for the various subgroups, as well as the key for the overall group, are presented in Table 6.14. Caulkins and Hyatt (1999) argue for the usefulness of the answer key as a diagnostic tool, even in cases where the domain is non-coherent or where consensus does not exist.

**Table 6.14**  
**Culturally Correct Response Keys<sup>27</sup> - Initial Review**

Variable	Bank	Govt	Trad	KBB	Spec	Gen	All
Market potential	4.75	4.39	4.85	4.53	4.64	4.62	4.62
Business plan	<b>5.08</b>	<b>3.74</b>	4.46	4.95	4.36	4.69	4.63
Collateral/security	1.88	2.02	1.92	2.00	2.17	1.91	1.97
Proven product/service	2.86	3.03	2.66	3.34	<b>3.73</b>	<b>2.75</b>	2.87
Potential funding available	3.81	4.27	3.87	3.78	<b>5.20*</b>	<b>3.41</b>	3.88
Stage of development of firm	3.03	3.32	3.07	2.93	2.78	2.99	2.98
Track record of entrepreneurs	4.51	4.99	4.72	4.59	4.35	4.61	4.59
Uniqueness of product/service	5.61	6.08	5.38	5.91	4.93	5.72	5.67
Potential cash flow	3.47	2.76	3.27	3.50	3.11	3.37	3.21
Management team	4.56	4.77	4.83	4.63	4.46	4.61	4.58
Demonstrated market acceptance	3.25	3.76	3.80	3.25	3.58	3.47	3.44
Logistics and facilities	3.45	3.35	4.06	3.13	3.66	3.56	3.46
General economic conditions	5.28	5.22	<b>4.10</b>	<b>6.15**</b>	5.55	5.04	5.20

Spec = account manager with a KBB focus; Gen = account manager with a non-KBB focus  
sig. \*  $p > .01 < .05$ ; \*\*  $p < .001$  – based on t-tests of means, not weighted averages.

A review of the data in Table 6.14 reveals a number of notable differences (highlighted in bold) among the various subgroups of account managers in terms of their ratings of the two business proposals. First, account managers in banks were more favourably impressed with the overall business plans than their counterparts in

<sup>27</sup> According to Borgatti (1996b), the answer key is the model's best guess as to the culturally correct answer to each question, and is based on a weighted average of respondents' answers with weights corresponding to level of knowledge. The numbers in this table represent the predicted answers for each group of account managers based on weighting respondents' ratings of the variables using the original 7 point Likert scale, where 1 = well below average, 4 = average and 7 = well above average.

government. Second, those who reviewed the proposal from the knowledge-based business felt general economic conditions were more conducive to start-up than did the account managers that reviewed the proposal from the traditional venture. Third, account managers with a focus on KBBs saw better prospects for the knowledge-based business to obtain other potential funding than did the more generalist account managers that reviewed the traditional plan. Finally, the KBB specialists rated the proven nature of the proposed knowledge-based service more highly than the generalist account managers rated the proven nature of the proposed traditional product.

Finally, the ratings at the initial review stage were subjected to discriminant analysis in an effort to identify potential explanatory variables underlying the assessments by the various subgroups, namely, account manager type, plan type and account manager focus. Results indicated no significant differences.

In summary, there is limited evidence at the initial review stage of a shared lending or risk assessment culture. In combination, results from the CA and the MDS suggest account managers are a diverse group of individuals. This is not surprising at the overall level, given differing mandates, policies and procedures, especially between banks and government agencies. The lack of consensus within the subgroups, particularly the banks, is more surprising given the structured processes generally associated with commercial lending activity. However, lack of agreement may reflect the fact that account managers have not used formal evaluation instruments and have not engaged in formal due diligence at this stage in the review process. As a result, risk assessment, at this stage, may not reflect structured policies and procedures.

Subgroup consensus, at the initial review stage, emerged only among account managers that reviewed the KBB proposal and among the smaller subset of account managers with a KBB focus. Interestingly, in the case of both these groups, consensus

is reflected in a very mixed view of the 13 proposal variables with approximately half being viewed more positively by these groups and half being viewed more negatively.

In addition, the review of the culturally correct response keys identified relatively few significant differences between the groups for the 13 variables rated. Similarly, results of the discriminant analysis provided little insight into potential explanatory variables underlying assessments by various subgroups, as no significant differences were found.

In terms of research question Q9<sup>28</sup>, a common or shared lending culture does not appear to exist among account managers in banks or government agencies at the initial review stage. In terms of research question Q10<sup>29</sup>, there is evidence of a shared culture among account managers with respect to risk assessment of knowledge-based businesses; however, the culture is not necessarily supportive of the needs of KBBs. To the contrary, agreement may reflect account managers' negative perceptions of the KBB proposal.

#### **6.4.2.2 Risk Assessment and Lending Culture at the Post Review Stage**

At the post review stage, account managers were interviewed to obtain a decision on the financing application, to obtain risk ratings and second-stage proposal ratings, to discuss the loan evaluation, risk assessment and decision-making processes, and to identify any additional concerns with the proposals. By this stage, account managers had completed their due diligence, had identified requirements for additional information and had conducted more in-depth assessment. Consequently, it was

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<sup>28</sup> Q9: Does a common or shared lending culture exist among account managers in chartered banks and government agencies?

<sup>29</sup> Q10: To what extent does the lending culture within chartered banks and government agencies reflect the needs of KBBs?

reasonable to expect changes in proposal ratings from the initial review stage. It was also anticipated that a higher level of agreement or consensus might emerge at the post review stage from the use of formal evaluation instruments and the application of structured policies and procedures.

As with the initial review, data from the post review ratings were subjected to consensus analysis. Results for all account managers are presented in Table 6.15 and provide a very similar picture to the initial review stage. The ratio of 2.761 between the first and second factors and the plot of the eigenvalues indicate low consensus and demonstrate a situation of weak agreement within the group, even though the first factor accounts for 60.1 percent of the variance. The CA results for the overall group are remarkably similar to those at the initial review stage, demonstrating lack of clear consensus.

**Table 6.15**  
**Consensus Analysis – Post Review**  
**All Account Managers**  
**(n=23)<sup>10</sup>**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	7.673	60.1	60.1	2.761
2	2.779	21.8	81.9	1.203
3	2.311	18.1	100.0	
Total	12.763	100.0		

Mean Knowledge Score - .533      Respondent Reliability - .901

A review of the knowledge scores generated by ANTIROPAC for respondents at the post review stage (Table 6.16) revealed one account manager had a negative

<sup>10</sup> It should be remembered that data for the initial review were based on 20 respondents.

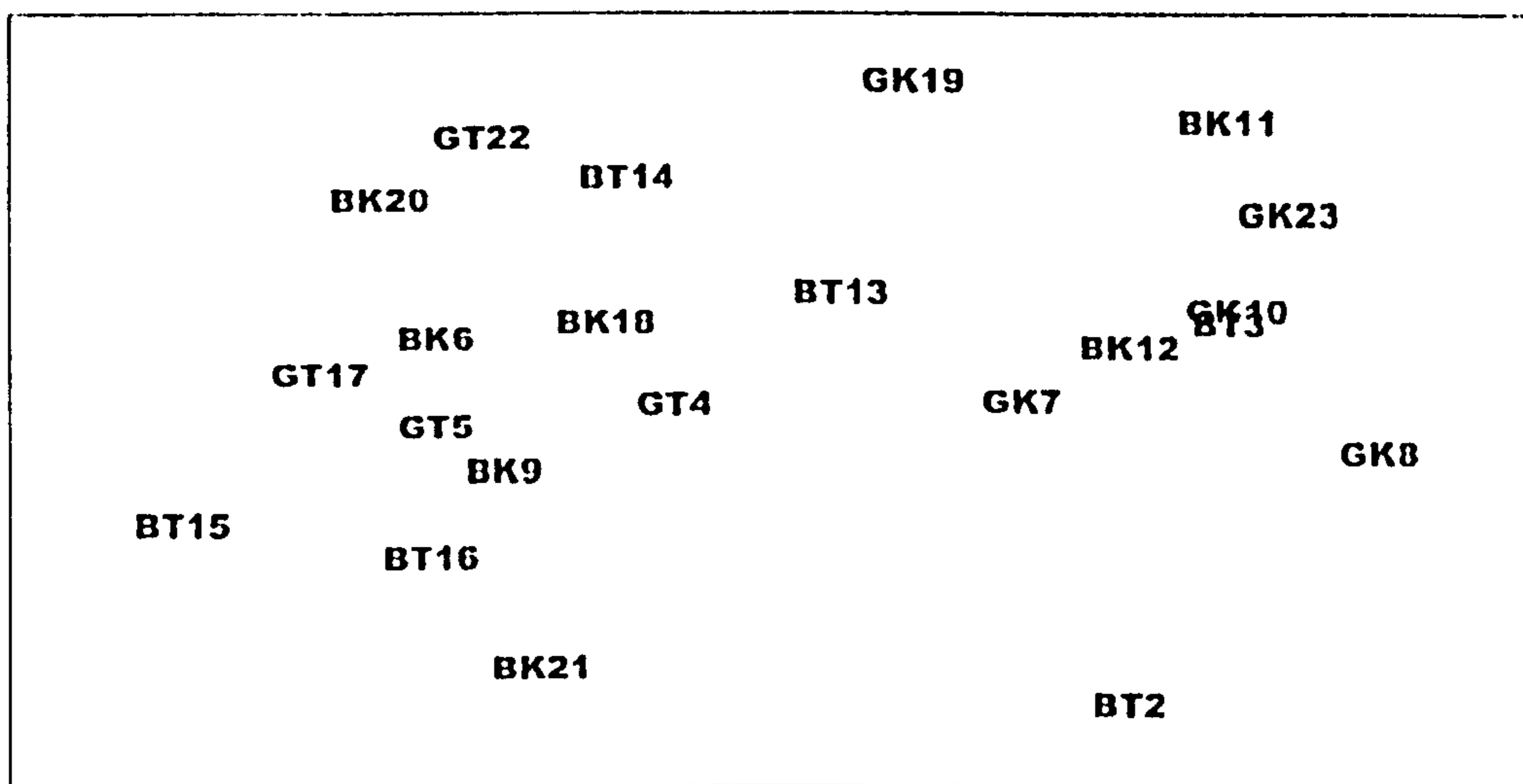
cultural knowledge score, as was the case at the initial review stage. Further examination of the data indicated this account manager was significantly more positive than the group on all aspects of the proposal with the exception of the overall business plan. A review of information obtained from the interviews revealed this individual had a significantly shorter tenure in the commercial lending and risk assessment areas (three years compared to a mean of 10). This may explain, at least in part, the very different perspective of this account manager. Again, following Caulkins and Hyatt's (1999) treatment of outliers, data for this account manager were omitted from subsequent analysis, thereby permitting a closer and more focused examination of the remaining account managers.

**Table 6.16**  
**Knowledge Scores of Account Managers – Post Review Stage**

<b>Participant</b>	<b>Knowledge Score</b>
GT1	-.02
BT2	.17
BT3	.65
GT4	.72
GT5	.73
BK6	.67
GK7	.18
GK8	.30
BK9	.58
GK10	.63
BK11	.79
BK12	.76
BT13	.77
BT14	.64
BT15	.74
BT16	.43
GT17	.63
BK18	.67
GK19	.59
BK20	.60
BK21	.29
GT22	.25
GK23	.50

The post review data for all account managers were also analyzed using non-metric multidimensional scaling. Figure 6.8 presents the results of the MDS confirming the pattern of weak agreement identified in the consensus analysis.

**Figure 6.8**  
**Multidimensional Scaling - Post Review**  
**All Account Managers**



Stress in 2 dimensions is 0.130

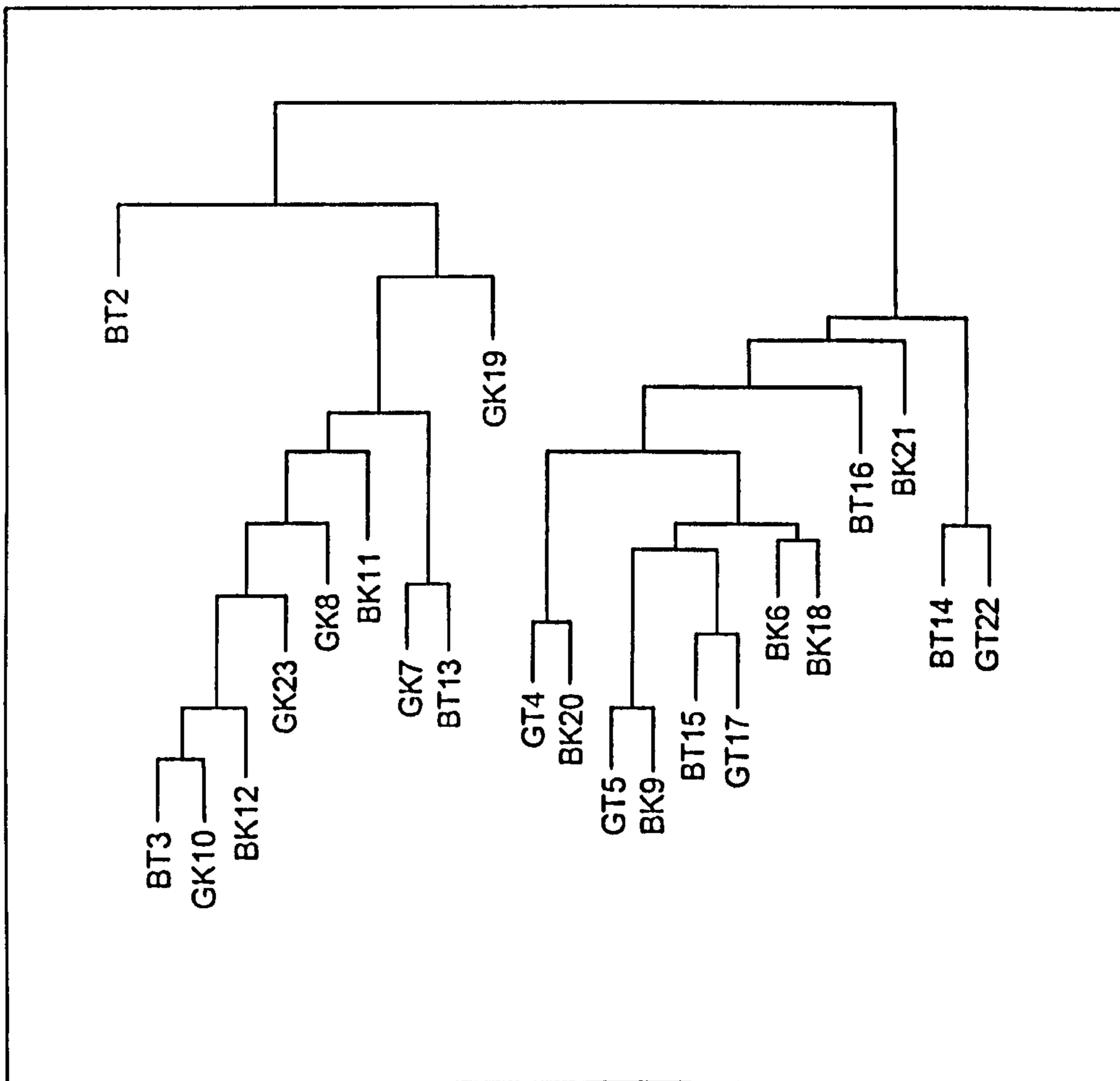
Hierarchical clustering was also employed at this stage to identify groups more clearly and to examine grouping patterns in greater detail. The results of the cluster analysis are presented in Figure 6.9 and reveal the formation of two almost equal size clusters<sup>31</sup>, each of which is comprised of a mix of account managers from banks and government agencies and a mix of account managers that reviewed each of the two proposals. Further, one cluster is situated entirely in the left portion of the MDS diagram (Figure 6.8), while the second group appears to the right.

<sup>31</sup> One group is comprised of BT2, BT3, GK10, BK12, GK23, GK8, BK11, GK7, BT13, and GK19. The other is comprised of GT4, BK20, GT5, BK9, BT15, GT17, BK6, BK18, BT16, BK21, BT14 and GT22.

These results demonstrate a higher level of agreement among the members of the overall group compared to the initial review stage, possibly resulting from a more formal and structured review process. Again, the lack of consensus at this stage is not surprising given the diversity of organizations and the fact that all account managers did not review the same proposal.

**Figure 6.9**

**Hierarchical Clustering – Post Review  
All Account Managers**



Consensus analysis and non-metric multidimensional scaling were also employed at the post review stage to examine patterns of agreement among the same



three a priori groupings of account managers as at the initial review stage, namely, account manager type, type of plan reviewed, and account manager focus.

The government account manager group again fails to reach consensus as evidenced by the ratio of 2.398 between the eigenvalues for the first two factors (Table 6.17). Further, a domain that indicates a highly turbulent perspective among its members has replaced the subcultural groupings that were evident at the initial review stage.

**Table 6.17**  
**Consensus Analysis – Post Review**  
**All Government Account Managers**  
**(n=9)**

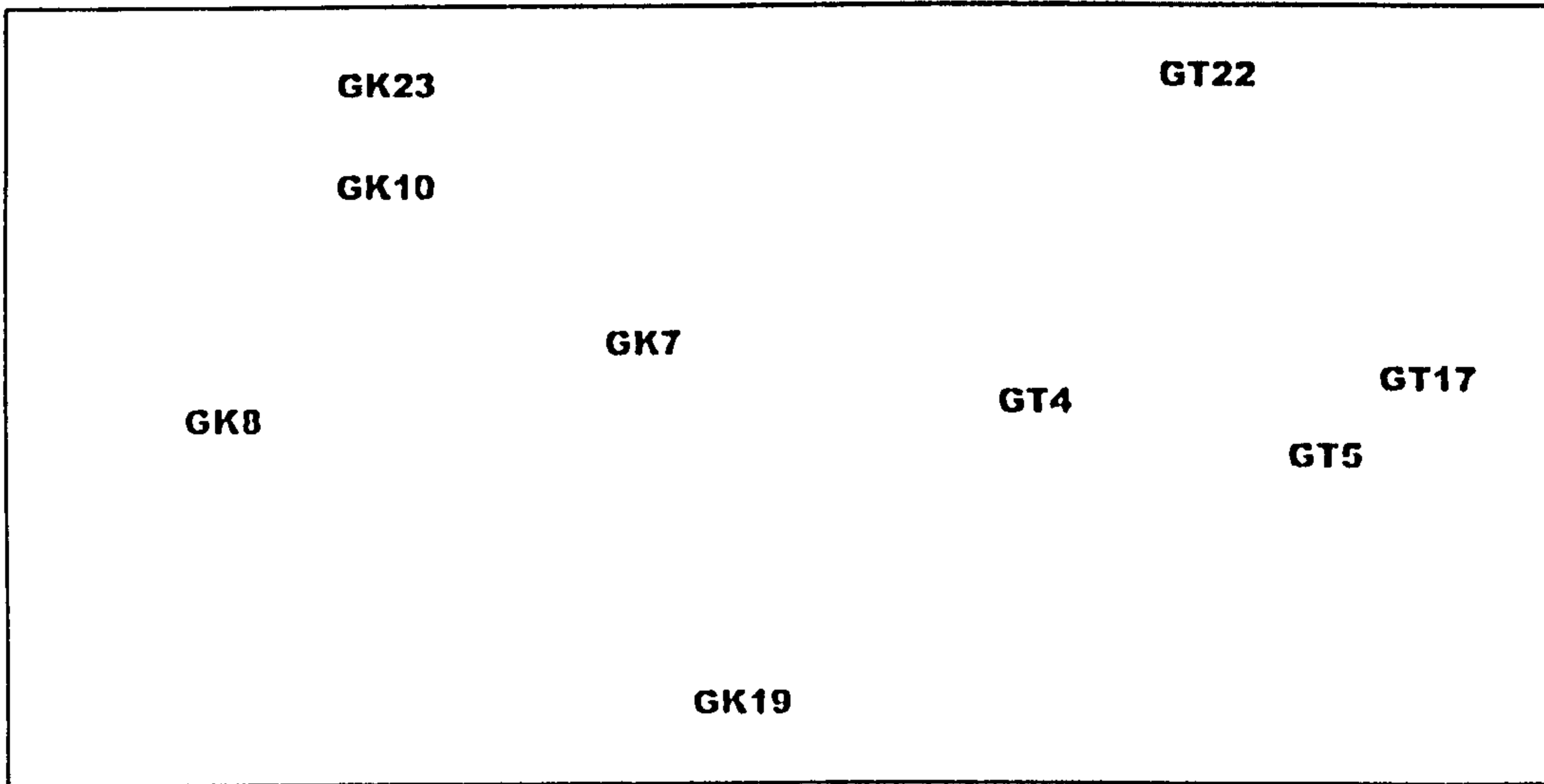
<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	2.407	59.4	59.4	2.398
2	1.004	24.8	84.1	1.562
3	0.643	15.9	100.0	
Total	4.054	100.0		

Mean Knowledge Score - .482      Respondent Reliability - .727

The diversity of opinion among members of the government account manager group is clearly evident in the MDS diagram presented in Figure 6.10. However, on closer examination a rather unique clustering pattern is visible. The account managers that reviewed the traditional proposal are all clustered to the right in the diagram, while those that reviewed the KBB proposal are all grouped to the left. Hierarchical clustering was used to examine this phenomenon in more detail. The results of the cluster analysis, presented in Figure 6.11, confirm the presence of the two primary clusters and their unique composition, suggesting higher levels of agreement within groups of account managers reviewing the same proposal.

Figure 6.10

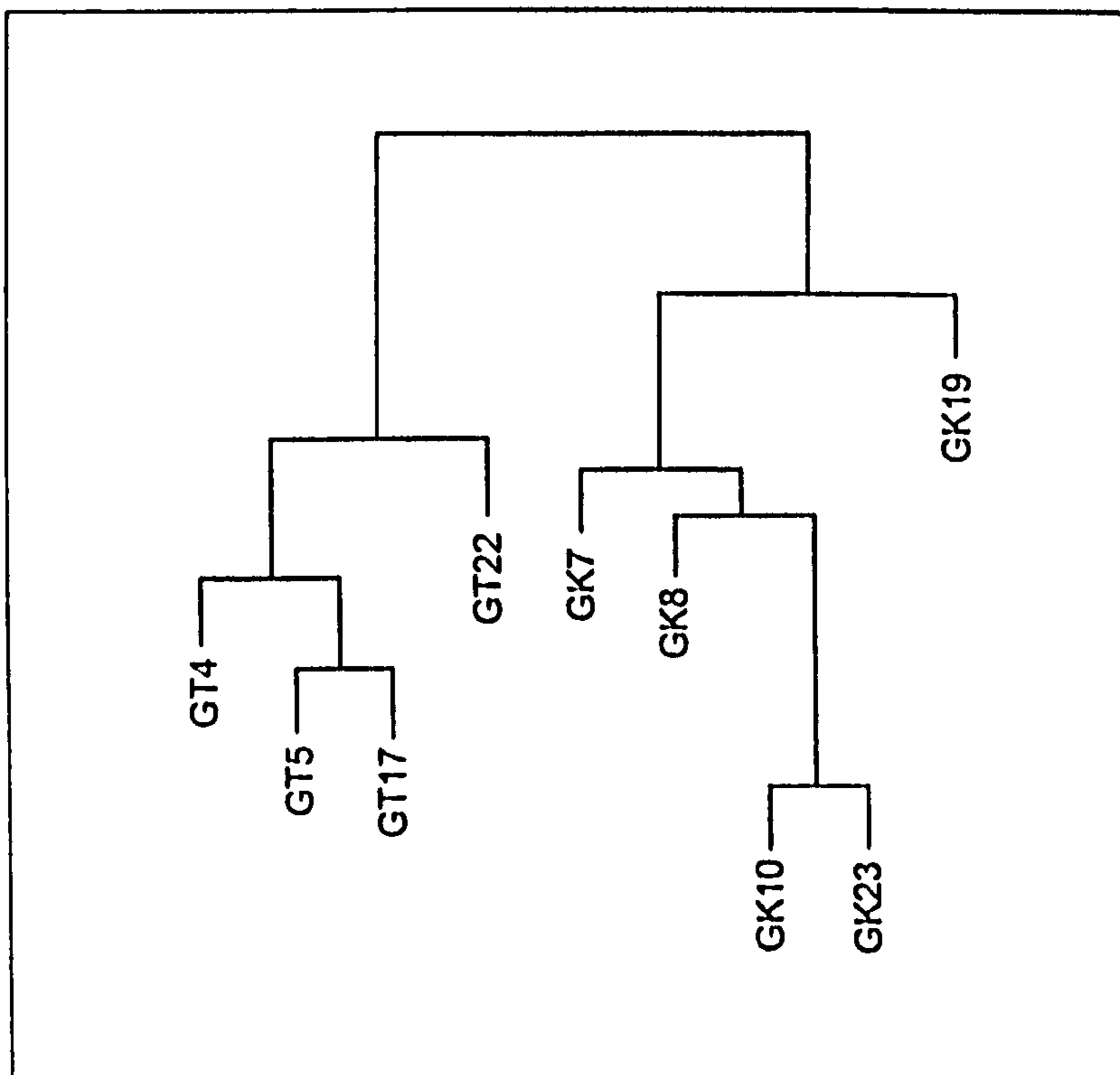
Multidimensional Scaling - Post Review  
All Government Account Managers



Stress in 2 dimensions is 0.023.

Figure 6.11

Hierarchical Clustering – Post Review  
All Government Account Managers



One further modification was made to the government category to enable additional analysis; the three account managers from the Business Development Bank of Canada were extracted from the group. Interviews with BDC staff and the review of secondary material confirm the organization's mandate<sup>12</sup> is more closely aligned with the chartered banks than it is with the other three government agencies. As a result, it may be unreasonable to consider BDC account managers in the same light as other government account managers. Subsequent consensus analysis, performed on the remaining group members, revealed a high agreement domain with 100 percent of the variance accounted for by a single factor (Table 6.18). These results confirm the existence of differences between BDC account managers and the rest of the group. CA performed on the same subset of government account managers at the initial review stage produced considerably different results. An eigenvalue ratio of 1.119 between the first two factors indicates an extremely low level of agreement, providing support for previous findings at the initial review stage.

**Table 6.18**

**Consensus Analysis – Post Review  
Government Account Managers (not including BDC)  
(n=6)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	1.959	100.0	100.0	
Total	1.959	100.0		

Mean Knowledge Score - .552

Respondent Reliability - .722

<sup>12</sup> In July of 1995, legislation governing the BDC was updated reaffirming its role as a complementary lender rather than its previous mandate as a lender of last resort.

The diversity of opinion, exhibited by bankers at the initial review stage, is even more apparent from the analysis of their post review ratings. Results of the consensus analysis, presented in Table 6.19, confirm the lack of consensus among the group (eigenvalue ratio of 2.450), while the straight-line plot of the eigenvalues signals a shift to a highly turbulent and diverse domain. It is worth noting that consensus analysis, performed on the bank group with the addition of the three BDC account managers, resulted in virtually no change in the level of agreement<sup>33</sup>. A reasonable interpretation of this result is that the BDC group fit well with the bankers, reinforcing the previous conclusion concerning the differences between the BDC and the other government agencies.

**Table 6.19**

**Consensus Analysis – Post Review  
All Bank Account Managers  
(n=13)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	4.945	59.5	59.5	<b>2.450</b>
2	2.019	24.3	83.8	1.496
3	1.350	16.2	100.0	
Total	8.314	100.0		

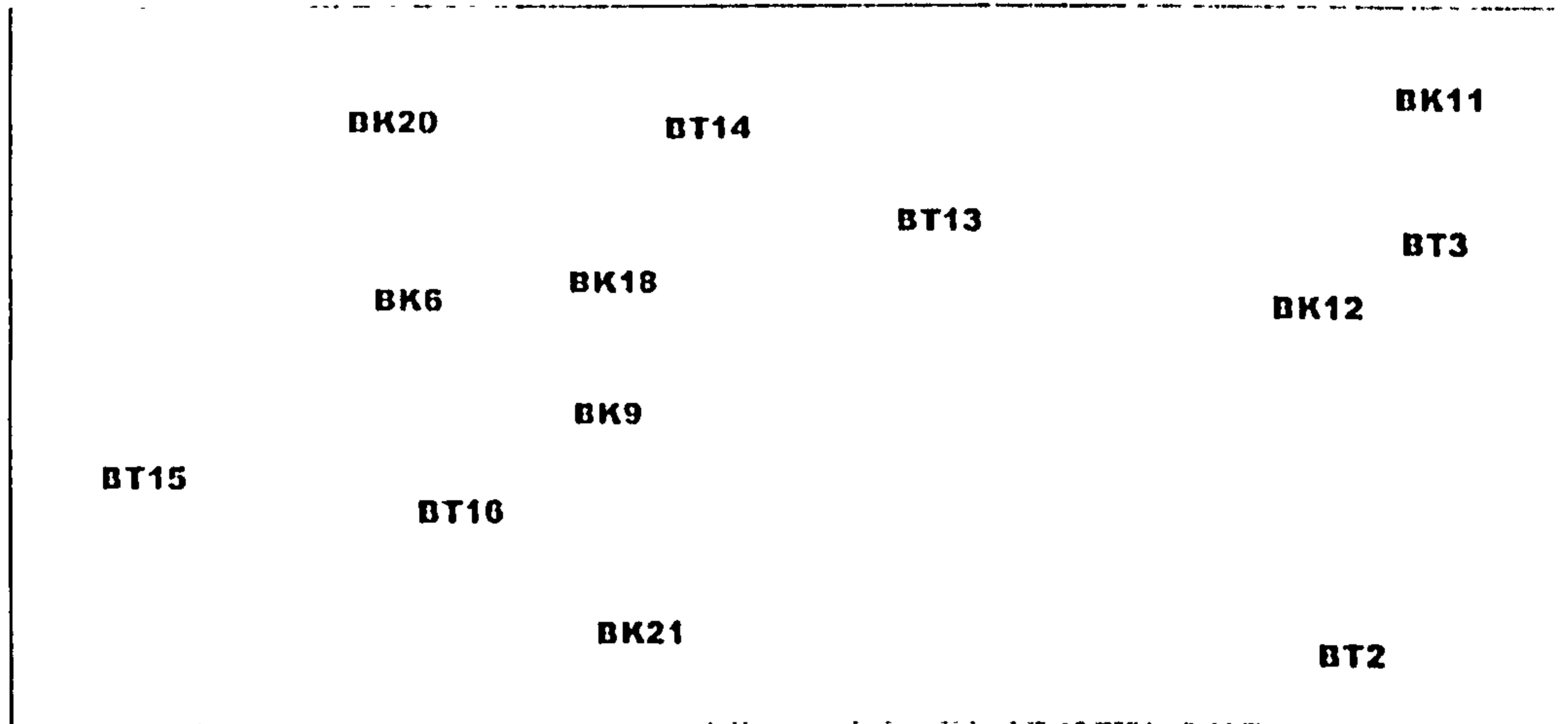
Mean Knowledge Score - .589      Respondent Reliability - .874

Results of non-metric multidimensional scaling, presented in Figure 6.12, provide a clear picture of the diversity and turbulence existing among the bankers at the post review stage.

<sup>33</sup>The eigenvalue ratio between the first two factors is 2.438 with the first factor accounting for 56.3 percent of the variance and the second factor explaining 23.1 percent of the variance.

Figure 6.12

**Multidimensional Scaling - Post Review  
All Bank Account Managers**



Stress in 2 dimensions is 0.108.

The finding of such diversity of opinion among the bank account manager group at this stage is somewhat surprising. Bankers were expected to be more structured and consistent in their approach to risk assessment and commercial lending, especially following the due diligence process. As a result, one further modification was made to the bank group at the post review stage; the two KBB specialists were removed from the group to permit an assessment of the level of consensus among the more traditional lenders. As indicated previously, discussions with bank staff and the review of secondary support material confirm five of the chartered banks take a different approach to knowledge-based businesses, utilizing KBB lending centres and employing KBB specialists. As a result, it is reasonable to expect some intra-cultural variability within a group comprised of both KBB specialists and traditional commercial lenders. Table 6.20 includes the CA results for the bank account managers with the KBB specialists removed and indicates a very different picture, one of a high level of agreement among the more traditional group of lenders.

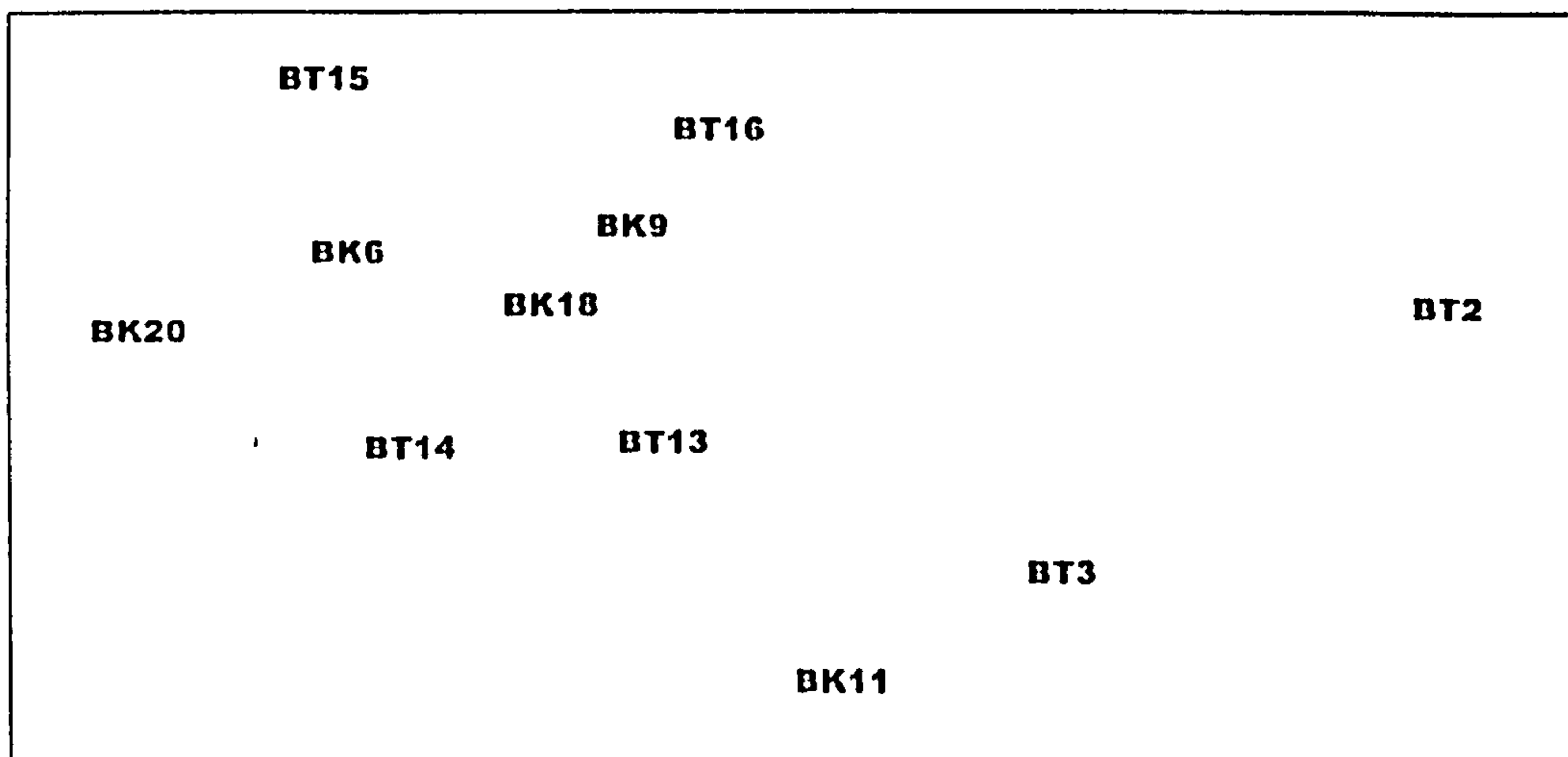
**Table 6.20**  
**Consensus Analysis – Post Review**  
**Traditional Bank Account Managers**  
**(n=11)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	4.324	64.5	64.5	3.494
2	1.238	18.5	83.0	1.088
3	1.138	17.0	100.0	
Total	6.700	100.0		

Mean Knowledge Score - .595      Respondent Reliability - .857

Figure 6.13 presents the results of the MDS for this subgroup of bank account managers, providing a picture of consensus among the traditional commercial lenders, a sharp contrast to the results for the overall group of bankers presented in Figure 6.12.

**Figure 6.13**  
**Multidimensional Scaling – Post Review**  
**Traditional Bank Account Managers**



Stress in 2 dimensions is 0.100.

It is noteworthy that CA performed on the same subset of traditional bank account managers at the initial review stage indicates little change (eigenvalue ratio of 1.028) from the low level of agreement reported previously for findings at the initial stage.

Results of the CA at the post review stage for the group of account managers that reviewed the traditional business plan are presented in Table 6.21. The eigenvalue ratio of 3.301 confirms a high level of agreement within the group with the first factor explaining 64.9 percent of the variance. This is a significant change from the highly turbulent low agreement domain evident for this group at the initial review stage.

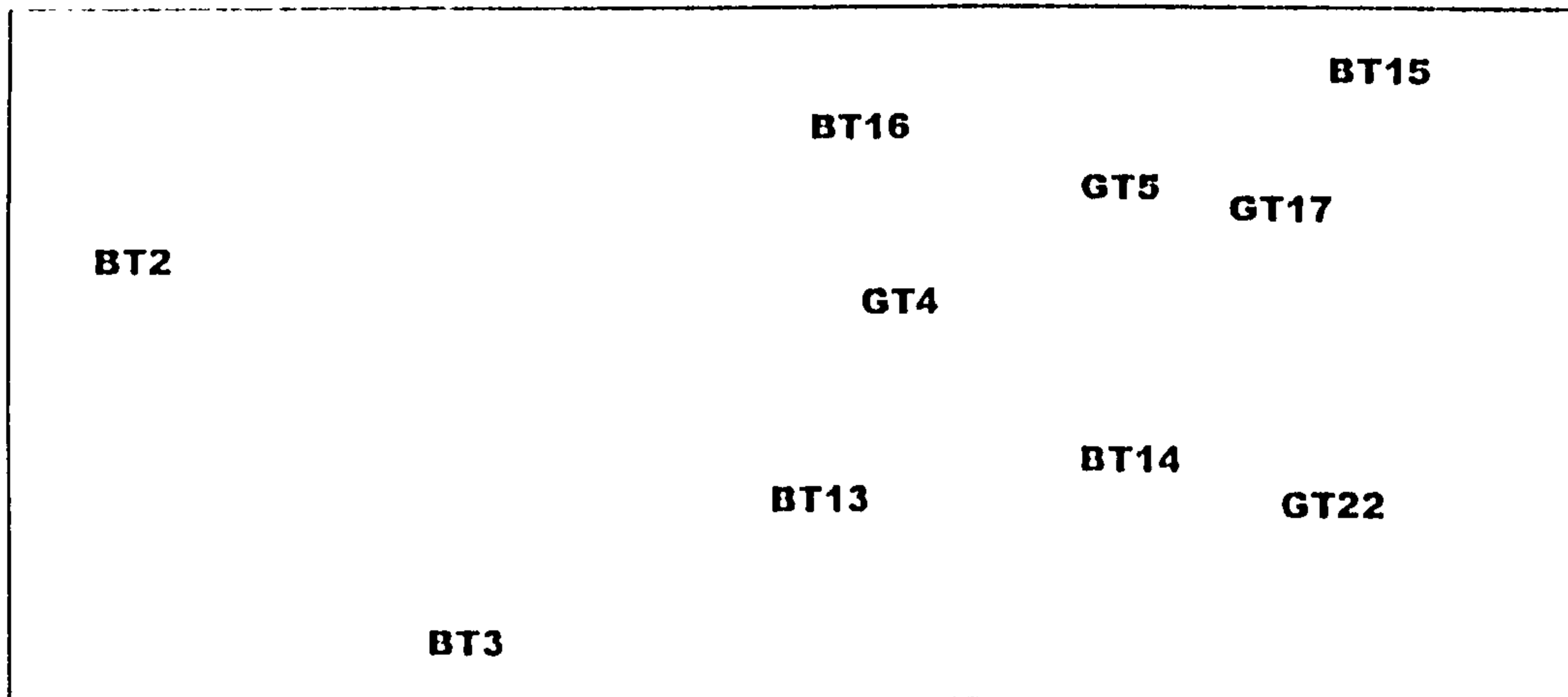
**Table 6.21**  
**Consensus Analysis – Post Review**  
**Traditional Business Plan**  
**(n=10)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	3.593	64.9	64.9	<b>3.301</b>
2	1.089	19.7	84.6	1.278
3	0.852	15.4	100.0	
Total	5.534	100.0		

Mean Knowledge Score - .565      Respondent Reliability - .821

The high level of agreement among members of this group is clearly visible from the review of the MDS results presented in Figure 6.14. The mix of account managers from the banks and government agencies is also quite noticeable in the primary cluster at the right of the diagram. Two outliers (BT2 and BT3) are also quite obvious in the MDS representation. These two bank account managers apparently hold considerably different views from the rest of this group.

**Figure 6.14**  
**Multidimensional Scaling - Post Review**  
**Traditional Business Plan**



Stress in 2 dimensions is 0.065.

CA results for those reviewing the KBB proposal, presented in Table 6.22, also reveal a different picture from the initial review. Consensus evident at the previous stage has been replaced by a pattern of weak agreement with an indication of two

**Table 6.22**  
**Consensus Analysis – Post Review**  
**Knowledge-Based Business Plan**  
**(n=12)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	3.930	57.8	57.8	2.272
2	1.730	25.4	83.2	1.517
3	1.140	16.8	100.0	
Total	6.800	100.0		

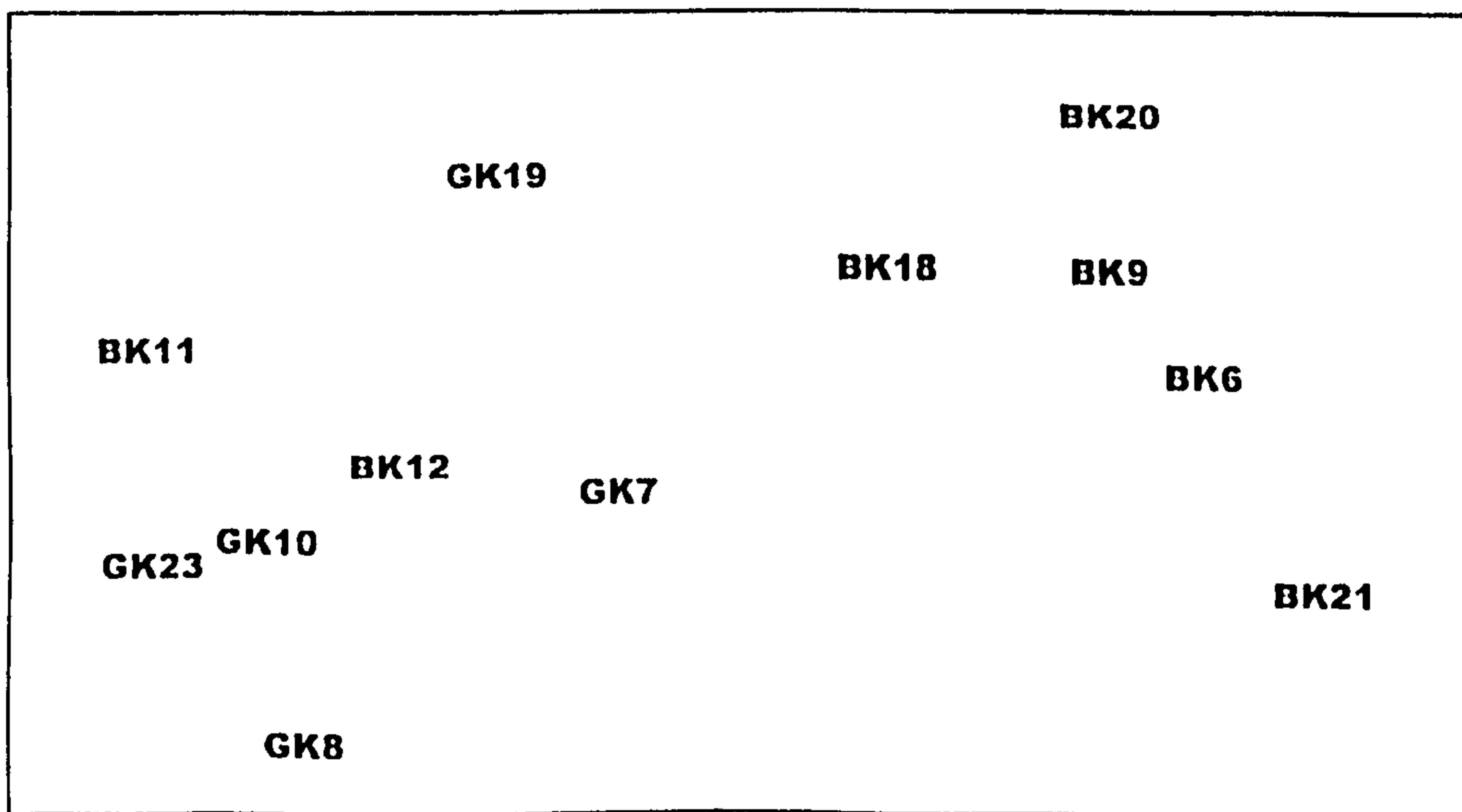
Mean Knowledge Score - .535      Respondent Reliability - .828



subcultural groupings. The two groups are depicted quite clearly in the MDS results presented in Figure 6.15. A review of these results also reveals that, with two exceptions (BK11 and BK12), one group<sup>34</sup> is comprised entirely of bank account managers, while the other is comprised primarily of government account managers. It would appear there is a higher level of agreement within each of the two groups than exists for the entire group that reviewed the KBB proposal.

**Figure 6.15**

**Multidimensional Scaling - Post Review  
Knowledge-Based Business Proposal**



Stress in 2 dimensions is 0.082.

The final a priori grouping contrasts account managers with a KBB focus with the more generalist account managers or those with a non-KBB focus. Results of the CA for those with a KBB focus indicate the presence of high agreement, as was the

<sup>34</sup> The group on the right is comprised of BK18, BK20, BK9, BK6 and BK21, while the group on the left is comprised of GK23, GK10, GK8, GK7 and GK19.

case at the initial review stage. A review of the results, presented in Table 6.23, reveals that 100.0 percent of the variance is accounted for by a single factor.

**Table 6.23**  
**Consensus Analysis– Post Review**  
**Account Managers with a KBB Focus**  
**(n=5)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	1.950	100.0	100.0	
Total	1.950	100.0		

Mean Knowledge Score - .590      Respondent Reliability - .712

Results of CA for the final group of account managers, those with a non-KBB or more general focus, also indicate consensus. As can be seen in Table 6.24, the eigenvalue ratio between the first two factors is 3.221. This is a marked contrast to

**Table 6.24**  
**Consensus Analysis – Post Review**  
**Account Managers with a Non-KBB Focus**  
**(n=17)**

<b>Factor</b>	<b>Eigenvalue</b>	<b>Percent</b>	<b>Cum. %</b>	<b>Ratio</b>
1	6.233	65.3	65.3	3.221
2	1.935	20.3	85.5	1.399
3	1.383	14.5	100.0	
Total	9.551	100.0		

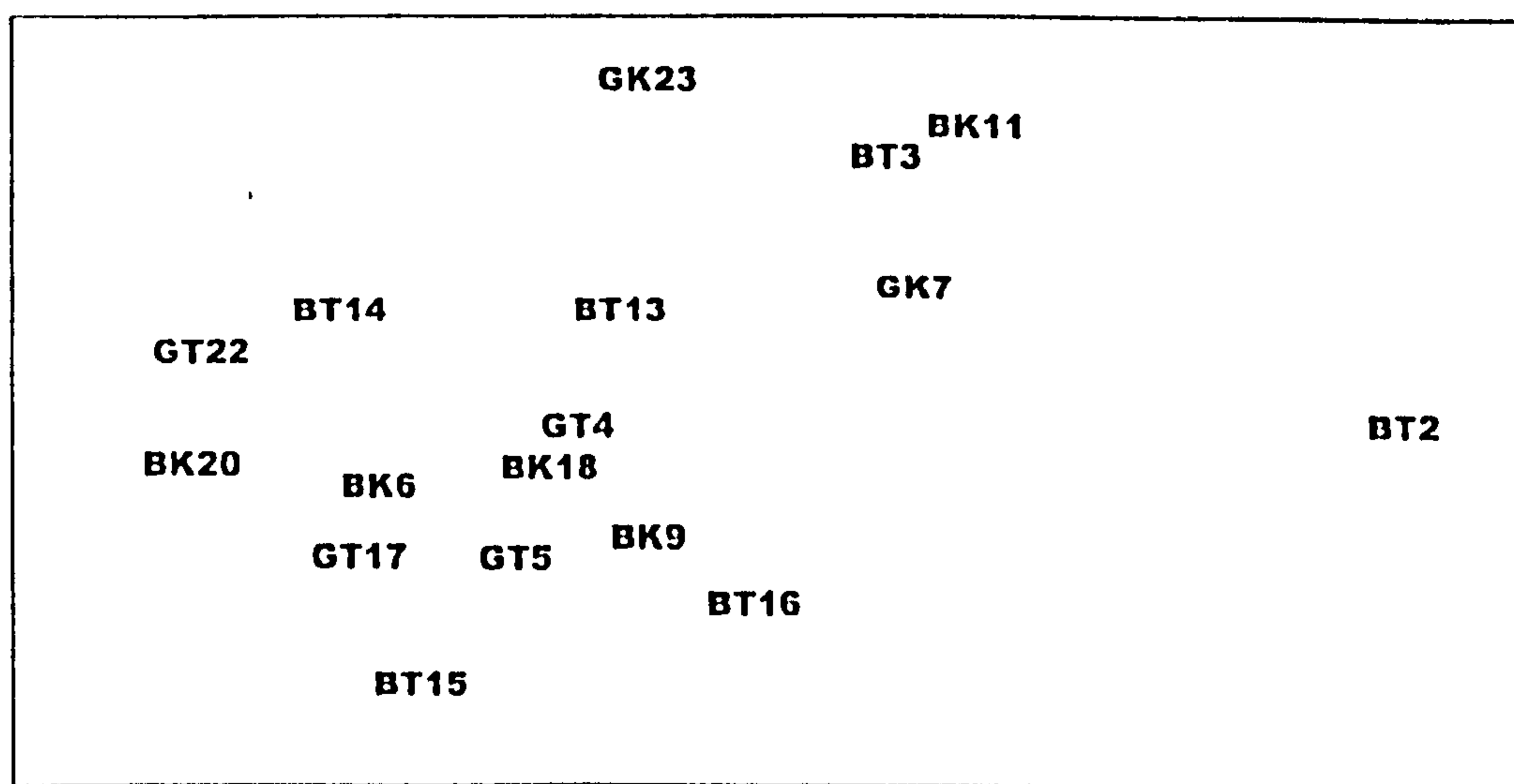
Mean Knowledge Score - .568      Respondent Reliability - .889

results at the initial review stage that not only indicated non-agreement, but also pointed to a turbulent domain. The pattern of agreement at the post review stage is

evident on review of the MDS results presented in Figure 6.16. Also noteworthy is the makeup of the core group depicted in the lower left of the diagram that consists of account managers from banks and government agencies and account managers that reviewed both types of proposals.

Figure 6.16

**Multidimensional Scaling - Post Review  
Account Managers with a Non-KBB Focus**



Stress in 2 dimensions is 0.113

Results of the consensus analysis at the post review stage provide a very different picture from the initial review stage. Post review results not only confirm a shift towards a greater level of agreement among account managers in all groups but also confirm the existence of consensus among a significantly greater number of groups. In some cases, these groups are comprised of a mixture of account managers in terms of both organizational affiliation and type of plan reviewed. However, subgroups comprised exclusively of bankers, government account managers, generalists, those with a KBB focus, and those that reviewed the traditional proposal also demonstrate

**Table 6.25****Culturally Correct Response Keys - Post Review**

<b>Variable</b>	<b>Bank</b>	<b>Govt</b>	<b>Trad</b>	<b>KBB</b>	<b>Spec</b>	<b>Gen</b>	<b>All</b>
Market potential	4.25	4.47	3.74	4.77	5.08	4.01	4.31
Business plan	4.17	4.11	3.95	4.34	5.02	3.84	4.14
Collateral/security	2.03	2.65	2.07	2.40	2.29	2.16	2.24
Proven product/service	2.37	2.81	2.13	2.78	4.11*	2.06	2.50
Potential funding available	4.15	3.92	3.49	4.47	4.88	3.59	4.03
Stage of development of firm	2.92	2.79	2.45	3.19	2.72	2.75	2.83
Track record of entrepreneurs	2.66	4.02*	3.05	3.22	4.27	2.79	3.14
Uniqueness of product/service	5.08	5.16	5.19	5.06	4.65	5.13	5.13
Potential cash flow	3.54	3.49	2.81	3.91	5.12	3.03	3.47
Management team	4.26	4.14	3.90	4.54	4.45	4.15	4.20
Demonstrated market acceptance	2.64	2.90	2.29	3.03	4.17	2.35	2.73
Logistics and facilities	2.85	3.05	2.38	3.55	3.79	2.50	2.95
General economic conditions	4.07	4.25	3.24	4.82*	3.95	4.05	4.13

Spec - account manager with a KBB focus; Gen - account manager with a non-KBB focus

\* sig.  $p < .05$  - based on t-tests of means, not weighted averages.

indicates significant differences in eight of the 13 variables with the ratings of the KBB specialists higher for all eight of these variables.

Comparing the post response keys to those generated at the initial review stage also reveals some interesting differences. Overall, perceptions appear to be less favourable at the later stage, following the due diligence process, except in the case of collateral/security, potential funding available and cash flow. In terms of specific subgroups, bankers, government account managers, and those who reviewed the traditional proposal have generally become more negative, while account managers who reviewed the KBB proposal and those with a KBB focus have generally become more positive.

In addition to ratings of the business plans at the post review stage, account managers were asked to indicate whether or not they had concerns with the proposals in the following areas: insufficient collateral/security, insufficient cash flow, insufficient income or revenue, business too risky, limited management expertise, and fit with their

organization's rules/requirements. Interviewees were also asked to identify any additional concerns. Table 6.26 includes a summary of affirmative responses.

**Table 6.26**  
**Account Manager Concerns with Business Proposals**  
**Affirmative Responses**  
**(n=23)**

Issue	Number	Percent
Insufficient collateral/security	17	73.9
Insufficient cash flow	13	56.5
Insufficient income or revenue	10	43.5
Business too risky	15	65.2
Limited management expertise	13	56.5
Didn't fit my organization's rules/requirements	12	52.2
Other	17	73.9

It is apparent from a review of Table 6.26 that, with the exception of insufficient revenue or income, the majority of account managers had concerns with all six aspects of the proposals. Although insufficient income was not identified as an issue by the majority of respondents, there were significant concerns expressed that the revenue projections were overly optimistic. As one account manager suggested "sensitivity analysis with a more conservative approach would strengthen the proposal."

In addition, almost three-quarters of the group identified additional concerns with the proposals, including insufficient equity, too highly leveraged, difficulty accessing other financing (especially from the banks), and a host of marketing, human resource and technical issues. It is noteworthy that seven account managers (30 percent) identified insufficient equity as a problem and six of these were bankers. A cross tabulation between type of account manager and identified issues with the proposals revealed three significant differences (based on Pearson chi-square) as

follows: insufficient collateral/security (92.3% vs. 50.0%:  $p < .05$ )<sup>17</sup>, business too risky (84.6% vs. 40.0%:  $p < .05$ )<sup>18</sup>, and did not fit organization's rules/requirements (76.9% vs. 20.0%:  $p < .01$ )<sup>19</sup>. In all three cases, affirmative responses by bank account managers were significantly greater than the government group. A comparison between type of proposal reviewed and identified issues revealed no significant differences.

To determine the relative importance of identified issues and concerns, account managers were asked to indicate the three most important, in order of importance. A number of observations can be made concerning the summary results presented in Table 6.27. First, collateral/security and cash flow are the major concerns followed by business risk and management. Second, insufficient income and fit with organizational requirements were not considered to be major issues. Third, additional issues, identified by account managers as one of the three most important, accounted for 30 percent of the total number of mentions. Again, lack of equity topped the list of additional concerns followed by issues related to marketing and access to operating credit.

Bankers were much more likely than government account managers to identify collateral/security, cash flow and business risk as major issues, while the government group were more concerned with marketing and technical issues and economic benefit to the Province. These findings reinforce results presented earlier with respect to additional information requests, indicating bankers place greater emphasis on financial aspects of the proposals, while the government group place more emphasis on the non-financial areas. The concern with economic benefits expressed by government account managers also reinforces previous conclusions with respect to differences between the

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<sup>17</sup> Pearson chi-square = 5.247 (1df)  $p = .022$

<sup>18</sup> Pearson chi-square = 4.960 (1df)  $p = .026$

<sup>19</sup> Pearson chi-square = 7.340 (1df)  $p = .007$

mandates of government agencies and banks.

**Table 6.27**

**Most Important Concerns with Business Proposals  
(n=23)<sup>40</sup>**

Issue	Most Important		Second Most Important		Third Most Important	
	n	%	n	%	n	%
Insufficient collateral/security	6	26.1	2	8.7	2	8.7
Insufficient cash flow	4	17.4	5	21.7	2	8.7
Insufficient income or revenue	1	4.3	1	4.3	1	4.3
Business too risky	3	13.0	3	13.0	1	4.3
Limited management expertise	2	8.7	4	17.4	1	4.3
Didn't fit organization's rules	1	4.3	1	4.3	3	13.0
Other	6	26.1	6	26.1	7	30.4

The issue of risk was explored further with account managers by asking them to rate the overall level of industry risk and the overall level of firm risk (on a scale of 1 to 7, where 1 = well below average and 7 = well above average) for the proposal they reviewed. In both cases, the comparison was to all loans/investments in their individual portfolios. Results indicate perceptions of high levels of risk for both the industry (mean = 5.59) and the firm (mean = 5.98). T-tests for equality of means for the various a priori groups (account manager type, plan type and account manager focus) revealed no significant differences in terms of industry risk. However, there were significant differences in terms of perceived firm-level risk between government account managers (mean = 5.40) and bankers (mean = 6.42)<sup>41</sup> and between account managers with a KBB focus (mean = 4.70) and generalist account managers (mean = 6.33)<sup>42</sup>. The perception of significantly lower risk levels by account managers in government is not surprising

<sup>40</sup> Not all respondents indicated a second and/or third most important issue.

<sup>41</sup> Mean difference = 1.02 sig. (2-tailed) p = .035

<sup>42</sup> Mean difference = 1.63 sig. (2-tailed) p = .003

and is consistent with the previously reported finding that they did not consider risk to be a major issue. This finding is also consistent with the previous discussion concerning the mandates of the various government agencies (except as noted for BDC) to facilitate economic development and thus emphasize net economic benefit to the Province.

More noteworthy, and certainly more interesting in the context of lending to KBBs, is the finding that account managers with a KBB focus perceive a significantly lower level of risk with the knowledge-based firm than do the more traditional account managers for risk associated with the traditional firm. This was true even though the comparison by type of proposal revealed no significant differences in perceptions of firm risk. These findings suggest account managers with a KBB focus do not place as much weight on traditional risk assessment practices and support previous findings of a shared lending culture in the context of KBBs.

In summary, analysis of the culturally correct responses keys and account managers' concerns and risk ratings at the post review stage provide a number of additional insights into risk assessment by account managers. First, account managers in banks are more concerned with financial aspects of the proposals, especially collateral, equity, cash flow, leverage and risk, while the government group is more concerned with non-financial issues related to the marketing and technical aspects of the ventures. Bankers also expressed more concern with the fit with organizational rules and requirements, while government account managers focused more on net economic benefit to the area. Overall, collateral/security and cash flow are the two most important concerns identified by account managers.

Second, account managers who reviewed the KBB proposal and those with a KBB focus are significantly more positive in their perceptions of the proposal than are



other groups of account managers.

Third, account managers' perceptions of industry and firm-level risk are generally high for both proposals. However, bankers perceive a significantly higher level of firm risk than do government account managers and KBB specialists perceive a significantly lower level of firm risk than generalist account managers. The latter was true even though there were no significant differences between account managers' risk perceptions of the two plans.

Results indicating more positive ratings by those who reviewed the KBB proposal and by those with a KBB focus, combined with the finding that the latter group also perceive a significantly lower level of firm risk than the traditional account manager group, indicate differences in risk assessment of KBBs. Thus, in terms of research question Q6<sup>43</sup>, it would appear that account managers with a KBB focus do not follow traditional risk assessment practices exclusively. Findings concerning risk ratings and risk assessment also help to explain differences in lending decisions between banks and government agencies as posited in research question Q8<sup>44</sup>. The findings of higher levels of risk perception by bankers and their emphasis on financial aspects of the proposals support and explain results, reported previously, indicating account managers in banks were less supportive of financing both ventures than were government account managers. It would appear loan evaluation and risk assessment by account managers in banks are influenced more by financial variables, especially collateral and cash flow, and that concerns in these areas may explain their perceptions of higher risk levels. The finding that account managers in banks place more emphasis

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<sup>43</sup> Q6: Does risk assessment of knowledge-based firms differ from risk assessment of less knowledge-intensive firms and, if so, how?

<sup>44</sup> Q8: Are there differences between lending decisions of chartered banks and lending decisions of government agencies? If differences exist, to what extent can they be explained by differences in institutional structures, loan evaluation and decision-making processes?

on the financial aspects of the proposed venture confirms Fletcher's (1995a) finding of dependence on financial information in risk assessment by Scottish bankers.

### 6.4.2.3 Comparison between Initial and Post Reviews

In addition to comparisons that have already been made on the basis of the results of the CA, the MDS and the IIC, the initial and post review data were compared using factor analysis and correlation analysis. Factor analysis was employed initially to gain additional insight into key variables. Table 6.28 includes the results of the factor analysis for the initial review data and Table 6.29 presents the post review results.

**Table 6.28**

#### **Factor Analysis – Initial Review Rotated Component Matrix**

Variable	Component				
	1	2	3	4	5
Market potential	2.258E-02	.196	<b>.934</b>	7.723E-02	-8.763E-02
Business plan	.130	.254	<b>.756</b>	8.446E-02	4.284E-02
Collateral/security	-5.160E-02	<b>.813</b>	.266	-.128	-1.229E-02
Proven product/service	.207	<b>.883</b>	.206	-1.985E-02	-.238
Potential funding	7.682E-02	-2.463E-03	.371	-.132	<b>.708</b>
Stage of development	<b>.935</b>	.202	3.963E-02	-.232	5.937E-02
Entrepreneurs' track record	.311	.561	2.050E-02	<b>.631</b>	.334
Unique product/service	-.603	-.306	-1.474E-02	-.193	<b>.646</b>
Cash flow	-.159	3.580E-02	<b>.419</b>	1.222E-02	-.831
Management team	.271	.522	<b>.527</b>	.251	.111
Market acceptance	-.119	-.218	.337	<b>.840</b>	-6.946E-02
Logistics and facilities	2.892E-02	3.935E-02	-4.105E-02	<b>.891</b>	-.204
Economic conditions	-.958	<b>2.968E-02</b>	-.163	-.176	-.105

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations.

The variables group into four factors at the initial review stage and only three at the post review stage. The four groupings at the initial stage are as follows:

1. Factor 1: collateral/security, proven product/service, and general economic conditions<sup>45</sup>
2. Factor 2: market potential, business plan, cash flow, and management team
3. Factor 3: track record of the entrepreneurs, market acceptance, and logistics and facilities
4. Factor 4: potential funding available and uniqueness of product/service

In addition, the variable stage of development of the firm loaded separately at the initial review stage.

**Table 6.29**

**Factor Analysis – Post Review  
Rotated Component Matrix**

Variable	Component		
	1	2	3
Market potential	.655	.223	.177
Business plan	.346	.711	-5.577E-02
Collateral/security	-4.627E-02	.704	.280
Proven product/service	.832	.190	-7.838E-02
Potential funding available	.839	-7.233E-02	.185
Stage of development of firm	.320	.416	.554
Entrepreneurs' track record	.364	.743	.256
Uniqueness of product/service	-.131	.270	.632
Cash flow	.789	.379	-.225
Management team	8.279E-02	.794	.275
Market acceptance	.652	.513	-4.989E-02
Logistics and facilities	.643	-1.643E-02	.487
General economic conditions	9.699E-02	9.198E-02	.819

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 11 iterations.

The three groupings at the post review stage are:

1. Factor 1: market potential, proven product/service, potential funding available, cash flow, market acceptance, and logistics and facilities

<sup>45</sup> The reader should note the extremely low loading of the variable general economic conditions.

2. **Factor 2: the business plan, collateral/security, track record of the entrepreneurs, and the management team**
3. **Factor 3: stage of development of the firm, uniqueness of product/service, and general economic conditions**

A number of observations can be made concerning the results of the factor analysis and the comparison between the two stages. Groupings at the initial review stage reflect considerable diversity. An examination of the four factors in the context of the literature on risk assessment by commercial lenders and venture capitalists provides little insight into the basis for the groupings. This is consistent with the findings of the consensus analysis and multidimensional scaling which indicated low levels of agreement and a significant degree of heterogeneity and turbulence among all groups at the initial review stage, except the two related to the knowledge-based business proposal (Tables 6.11 and 6.12).

Post review results indicate account managers perceive a greater degree of similarity among the variables, as evidenced by the loadings onto fewer factors. Further, post review groupings appear to more closely resemble elements of the risk assessment models identified in the literature which focus on variations of the traditional "Cs" of credit – capital, capacity, collateral, character, and conditions. Capital and capacity are clearly evident in factor 1 variables, potential funding and cash flow. Market related variables, such as market potential, market acceptance, and proven product/service, also fit well in this category since they represent the capacity to generate cash flow. Factor 2 encompasses collateral and aspects of character and management, such as the track record of the entrepreneurs, the management team and the overall business plan. The third factor includes a combination of internal and external conditions, such as the stage of development of the firm, uniqueness of the

product/service, general economic conditions, and to a lesser extent, logistics and facilities. Although the latter variable loads more heavily onto the first factor (.643), it also loads well onto factor 3 (.487). Overall, post review factor analysis results are consistent with the findings of the CA and MDS which confirmed a shift in the direction of more agreement and consensus among all groups of account managers.

As a final step in the analysis of the ratings of the business proposals, initial ratings were compared to post review ratings by computing correlations. A review of the results presented in Table 6.30 indicates the correlation between ratings at the two stages was significant on six of the 13 variables as follows: proven product/service, track record of the entrepreneurs, the management team, the business plan, collateral/security, and general economic conditions.

**Table 6.30**  
**Correlation Between Initial and Post Review Ratings**

Variable	n	Pearson Correlation	Sig. (2-tailed)
Market potential	19	.035	.886
Business plan	20	.492*	.027
Collateral/security	18	.517*	.028
Proven product/service	18	.610**	.007
Potential funding available	20	-.061	.799
Stage of development of firm	20	.309	.184
Entrepreneurs' track record	17	.677**	.003
Uniqueness of product/service	19	.384	.105
Cash flow	18	.411	.091
Management team	20	.667**	.001
Market acceptance	18	-.005	.984
Logistics and facilities	20	.412	.071
General economic conditions	20	.493*	.027

\*\* Correlation is significant at the 0.01 level (2 tailed)

\* Correlation is significant at the 0.05 level (2 tailed)

It would appear initial perceptions of the proposals in these six areas are confirmed on further deliberation. However, the low correlation on the remaining

variables suggests subsequent due diligence has a significant impact on account managers' perceptions and likely plays an important role in overall risk assessment and loan evaluation.

In summary, results of the factor analysis and the correlations indicate some very significant differences between initial review and post review ratings. Factor analysis indicates convergence among the variables at the post review stage and supports findings from the consensus analysis and multidimensional scaling indicating a shift in direction towards increased agreement among account managers in all groups. Also noteworthy is the low correlation between the ratings at the two stages on seven variables, suggesting initial perceptions of account managers in these areas are modified significantly after further due diligence and risk assessment.

## **6.5 Summary of Supply-Side Findings**

This chapter presented results and discussed findings in the three primary supply-side areas of the study, namely, organizational framework, decision-making and loan evaluation.

Research question Q4 raised the issue of the impact of organizational framework on loan evaluation and decision-making by account managers. Findings based on an analysis of interviews, verbal protocols and account manager information requests indicate organizational variables, such as strategies, structures, and policies and procedures affect lending decisions. However, there was no evidence the effects are different for knowledge-based firms compared to less knowledge-intensive firms.

To address research question Q5 concerning the information acquisition strategies employed by account managers to support decision-making, interview data

related to the availability and utilization of internal and external resources were<sup>4</sup> analyzed. Findings concerning support for decision-making indicate the existence of a range of internal and external resources specifically designed to facilitate loan evaluation and risk assessment of KBBs, particularly in banks. Notwithstanding the availability of such support, there was limited evidence of differences in approach taken by account managers when assessing the proposal from the knowledge-based firm. Account managers in government rely more on external resources when assessing the KBB proposal, while bankers rely more heavily on internal sources of assistance. The latter clearly are more developed in banks than in government.

The third, and arguably most critical supply-side component of the study, was loan evaluation, more specifically, risk assessment. The remaining research questions focused on loan evaluation and risk assessment in an attempt to determine the following:

- Does risk assessment of KBBs differ from risk assessment of less knowledge-intensive firms?
- Does loan structuring and loan management by banks differ in the context of KBBs?
- Are there differences in lending decisions between banks and government agencies, and if so, why do they differ?
- Is there a shared lending culture among account managers in banks and government?
- Does the lending culture in banks and government reflect the needs of KBBs?

To investigate process and content elements of loan evaluation and to address these specific questions, it was necessary to examine account managers' lending

decisions and recommendations, proposal ratings, risk ratings and identified concerns. The analysis of lending decisions and recommendations in light of research question Q8 indicates government account managers were more favourably disposed to both proposals than the bankers. The reasons for this relate more to the mandates of government agencies and the types of support available than to any differences in institutional structures and processes. Similarly, there was no evidence the type of firm, whether KBB or traditional, was an explanatory factor in the lending decisions and recommendations. Unfortunately, it was not possible to address research question Q7 concerning loan structuring and loan management by banks in the context of KBBs, since there were too few cases where bank account managers were prepared to recommend financial assistance.

Results of the analysis of the business plan reviews and associated ratings confirm it is possible to measure culture using consensus analysis. ANTIROPAC software was able to assess the extent of intra-cultural variability within the various groups of account managers and to determine whether or not a common lending culture exists. A summary of CA findings is included in Table 6.31. Results of the analysis of ratings at the initial review stage indicate account managers are a diverse group of individuals but also provide limited evidence of a shared lending culture among account managers that reviewed the KBB proposal and among the small group of account managers with a KBB focus. A high level of agreement among the members of these groups provides an initial indication of the existence of a lending culture in the context of knowledge-based businesses. However, the underlying basis for agreement is somewhat mixed reflecting account managers' negative perceptions, as much, if not more than support for the KBB proposal.



**Table 6.31**  
**Consensus Analysis Summary Findings**

<b>Analysis of Account Manager Group</b>	<b>Eigenvalue Ratio</b>	<b>Level of Agreement Found</b>
<b>Initial review stage:</b>		
All account managers	2.199	Weak agreement
Government account managers	1.536	Weak agreement with subcultural groupings
Government minus BDC	1.119	Low agreement
Bank account managers	1.678	Weak agreement and turbulent domain
Traditional bankers	1.028	Low agreement and turbulent domain
Traditional Proposal	1.494	Turbulent domain
KBB Proposal	3.687	Consensus
KBB Specialists	4.687	Consensus
Generalists	2.100	Weak agreement and turbulent domain
<b>Post review stage:</b>		
All account managers	2.761	Weak agreement
Government account managers	2.398	Turbulent domain
Government minus BDC	100.0% <sup>46</sup>	Consensus
Bank account managers	2.450	Turbulent domain
Traditional bankers	3.494	Consensus
Traditional Proposal	3.301	Consensus
KBB Proposal	2.272	Weak agreement with subcultural groupings
KBB Specialists	100.0%	Consensus
Generalists	3.221	Consensus

Results at the post review stage confirm an overall increase in the level of agreement among all account managers and an increase in the number of subgroups demonstrating consensus. In a number of cases, these groups are comprised of a mixture of account managers in terms of both organizational affiliation and type of plan reviewed, indicating the influence of the due diligence process on all account managers. However, there is also an indication of high levels of agreement within a number of notable subgroups, such as government agencies with a shared economic development

<sup>46</sup> Indicates all of the variance is explained by one factor.

mandate, traditional commercial bank account managers, and account managers with a KBB focus. In response to research question Q9, findings support the conclusion of a shared lending and risk assessment culture at the post review stage but, in response to research question Q10, findings provide only limited evidence among the small group of account managers with a KBB focus of a culture that reflects the needs of KBBs.

To explore the underlying basis of consensus among groups of account managers and to determine differences in risk assessment as posited in research question Q6, the study analyzed account managers' proposal ratings and related concerns, and risk ratings at the post review stage. Findings confirm bankers are more concerned with financial aspects of the ventures, especially collateral, cash flow, and equity and perceive higher levels of firm risk than government account managers. More significant, in the context of knowledge-based businesses, are the findings that those who reviewed the KBB proposal and those with a KBB focus were more positive in their ratings at the post review stage than other groups and that the KBB specialists perceived significantly lower levels of risk. Thus in response to research question Q6, it appears risk assessment of KBBs does differ from risk assessment of more traditional firms.

Finally, there were two significant findings resulting from the comparisons between the initial and post review data using factor analysis and correlations. First, factor analysis demonstrates convergence among the rating variables at the post review stage compared to the initial review, providing support for the finding of an emerging lending culture. Second, the very low correlations between the initial and post review ratings for seven of the 13 variables, indicates initial ratings are modified significantly, suggesting subsequent due diligence has a significant impact on account managers' overall risk assessment.

## CHAPTER 7

### CONCLUSIONS

#### 7.0 Introduction

This thesis is an exploratory study of institutional lending to knowledge-based businesses in Newfoundland and Labrador. It draws upon literature from several cognate areas, including capital structure, credit rationing, commercial lending, venture capital and intellectual capital. A research framework and supporting research questions were developed from the literature to facilitate the study of institutional lending from both the demand-side perspective of knowledge-based businesses and the supply-side perspective of lending institutions.

The demand-side perspective, based primarily on a mail survey to entrepreneurs, addresses the roles played by the chartered banks and government agencies in financing the start-up of knowledge-based businesses, as well as the experiences and perceptions of entrepreneurs in terms of their dealings with financial institutions. Survey data enabled a comparison between high knowledge-firms and less knowledge-intensive firms to determine differences in their borrowing experiences and in their perceptions of lending by chartered banks and government agencies.

The study explores supply-side perspectives by examining lending decisions of chartered banks and government agencies using an exploratory model comprised of three main components: organizational framework, decision-making process and loan evaluation. Simultaneous verbal protocols and semi-structured interviews are utilized to examine lending processes and decision criteria of account managers at two stages of assessment: during the initial review of the business plan and following the due

diligence and loan evaluation process. Account managers also identified information gaps in the two business proposals designed for the study. In addition, interviews with senior managers provide details of institutional strategies aimed at the knowledge-based sector and institutional structures designed to serve the needs of KBBs. Consensus analysis from the field of cognitive anthropology is used to explore the existence and pervasiveness of a lending culture within chartered banks and government agencies and among various subgroups of account managers.

The remainder of this chapter presents the key findings from the study, identifies the limitations of the research, discusses the implications of the work for theory, management practice, and policy making, and makes recommendations for future research.

## **7.1 Summary of Findings**

The key findings are organized and presented according to the two main components of the study: the demand-side perspectives of knowledge-based businesses and the supply-side perspectives of lending institutions.

### **7.1.1 Summary of Demand-Side Findings**

The mail survey was undertaken to collect data necessary to address three critical research questions concerning the demand-side as follows:

- Q1:** What roles have the chartered banks and government agencies played in financing knowledge-based firms and how do they differ from the roles played in financing less knowledge-intensive firms?
- Q2:** What have been the experiences of KBBs with obtaining debt financing from chartered banks and government agencies and how do they compare to the experiences of less knowledge-intensive firms?
- Q3:** What are the perceptions of KBBs with respect to chartered bank and government financing and how do they compare with the perceptions of less knowledge-intensive firms?

To address the first research question, survey data related to sources of start-up capital were analyzed. Results indicate three significant differences between high knowledge firms and less knowledge-intensive firms:

- High knowledge firms rely more heavily on personal sources of capital than less knowledge-intensive firms (mean difference = 20.4,  $p < .001$ ).
- Less knowledge-intensive businesses make greater use of chartered bank financing than high knowledge firms (mean difference = 10.3,  $p < .05$ ).
- Less knowledge-intensive businesses make greater use of government loans than high knowledge firms (mean difference = 7.4,  $p < .01$ ).

These findings are consistent with results of prior research indicating KBBs rely more heavily on equity and use less debt from financial institutions (Thompson, Lightstone and Company, 1998). On the basis of these findings, it appears chartered

banks and government agencies do not play as significant a role in financing high knowledge firms at start-up as they do in financing less knowledge-intensive firms.

To address the second question concerning experiences dealing with chartered banks and government agencies, it was necessary to analyze survey data on the timing, nature and outcome of attempts to access financing from chartered banks and government agencies. The following notable differences were found between KBBs and less knowledge-intensive firms in these areas:

- A significantly lower percentage of high knowledge firms seek financing from government agencies at the idea/start-up stage than less knowledge-intensive firms (Pearson chi-square = 16.504 (5df)  $p=.006$ ).
- High knowledge firms are more likely to seek operating credit and less likely to request term financing from chartered banks than less knowledge-intensive firms (Pearson chi-square = 10.348 (7df)  $p=.170$ ).
- High knowledge firms request significantly lower amounts of operating credit from banks than less knowledge-intensive firms (mean difference = 73663  $p=.033$ ).
- High knowledge firms request lower amounts of term financing from banks than less knowledge-intensive firms (mean difference = 161995  $p=.142$ ).
- High knowledge firms are more likely to request R and D financing and less likely to request term financing from government agencies than less knowledge-intensive firms (Pearson chi-square = 11.155  $p=.084$ ).
- High knowledge firms are less successful obtaining chartered bank financing than less knowledge-intensive firms (Pearson chi-square = 4.430 (2df)  $p=.109$ ).
- High knowledge firms are more successful obtaining financing from government agencies than less knowledge-intensive firms.

Although not all these findings are statistically significant, they combine to provide an overall picture of KBBs compared to less knowledge-intensive firms in terms of access to chartered bank and government financing. The picture that emerges is one of a knowledge-based business that is more likely to need operating credit to finance working capital and research and development costs compared to a traditional firm that is more likely to need term financing to purchase tangible assets. While chartered banks appear to be the choice of KBBs for operating credit, KBBs turn to government agencies to finance research and development costs. Financial theory concerning capital structure suggests there should be independence between asset selection and choice of financing. This is clearly not the case with the small firms in this study.

KBB attempts to secure financing also have achieved different results than more traditional firms. On the one hand, KBBs have experienced greater difficulty obtaining financing from chartered banks, suggesting efforts by banks to cater to their needs have been less than successful. On the other hand, KBBs have been more successful obtaining financing from government agencies than traditional businesses. Government support of KBBs may be an indication the knowledge-based sector is seen as a strategic growth area, one that is considered to be more consistent with government's emphasis on economic development.

It is also apparent from these findings that KBBs request significantly lower amounts of operating credit and lower (although not significant) amounts of term financing from chartered banks than less knowledge-intensive firms. However, it is not clear whether these differences reflect different needs or different expectations. In other words, do KBBs require less financing in these areas or do they request less because they assume they will encounter difficulty obtaining larger amounts? The

former explanation appears reasonable for term financing given the intangible nature of many of the assets of these firms. However, the latter explanation also seems plausible in light of the findings that KBBs experience more difficulty obtaining financing and given the perceived emphasis placed on collateral by the chartered banks.

In terms of the third and final research question concerning demand-side perspectives, study findings reveal only one notable difference between the high knowledge group and firms in the medium and low knowledge category as follows:

- KBBs perceive chartered banks place greater weight on collateral and security than less knowledge-intensive firms (Pearson chi-square = 15.393 (11df)  $p = .165$ ).

As just discussed, this finding has implications not only for risk assessment by banks, but also in terms of the potential impact on the borrowing behaviour of prospective clients. Notwithstanding initiatives undertaken by chartered banks to better serve the needs of KBBs, this finding suggests chartered banks continue to take a traditional approach to risk assessment. Further, the perception by KBBs that chartered banks emphasize collateral could contribute to fewer requests from KBBs for support or to requests for reduced levels of support. Binks *et al.* reached a similar conclusion in their study of banks in the United Kingdom.

Overall, survey findings provide considerable insight into the experiences and perceptions of KBBs compared to less knowledge-intensive firms concerning access to chartered bank and government financing. However, future research is required to determine if the trends identified in this survey yield statistically significant results.



## **7.1.2 Summary of Supply-Side Findings**

On the supply-side, the study examined three primary components of institutional lending, namely, organizational framework, decision-making and loan evaluation. The specific research questions and summary of related findings are presented in each of these areas.

### **7.1.2.1 Organizational Framework**

The study examined organizational strategies and structures of chartered banks and government agencies in an attempt to answer the following question:

**Q4** Are loan evaluation and decision-making affected by organizational variables and are the effects different for knowledge-based firms compared to less knowledge-intensive firms?

Findings, based primarily on a review of verbal protocols and follow-up information requests by account managers, indicate loan evaluation and decision-making are affected by organizational variables, such as strategies, structures, policies and procedures. These findings are consistent with those of McNamara and Bromiley (1997) indicating standardization of the loan review process sensitizes account managers to the risk presented by borrowers. While the effects in the present study are evident in the differing approaches taken by bank account managers compared to those taken by account managers in government agencies, there was no evidence to indicate any differential effects by type of firm. On the contrary, standardized policies and

procedures were evident in the review and assessment of the KBB proposal, as well as the proposal from the traditional firm. This was true, even though lending institutions, especially banks, had established strategies and structures to cater specifically to the knowledge-based sector.

#### **7.1.2.2 Decision-Making Process**

To address the following research question, the study examined the decision-making processes of account managers, including information acquisition strategies and use of resources:

**Q5** What are the information acquisition strategies employed by account managers to support credit decision-making and are there differences between the information acquisition strategies used by account managers in making lending decisions to knowledge-based businesses compared to less knowledge-intensive firms?

Findings indicate a number of differences between government account managers and account managers in banks, in terms of both frequency and types of support used. Government account managers consult more external sources, while bankers rely more on internal resources available in specialized departments. Bank account managers also place more emphasis on client credit information. The more noteworthy findings, however, concern decision-making in the context of KBBs. Study findings confirm the existence of a well-established network, especially in the case of the chartered banks, to support risk assessment of KBBs. However, the study found only limited evidence of differences in approaches utilized by account managers who

reviewed the KBB proposal. It may be that using hypothetical business cases<sup>1</sup> limited account managers from taking full advantage of available resources in this experiment.

### **7.1.2.3 Loan Evaluation**

The final supply-side component examined in the study was loan evaluation, in particular, risk assessment. The remaining research questions<sup>1</sup> deal primarily with loan evaluation and risk assessment and the extent to which they differ between knowledge-based businesses and more traditional firms.

**Q6** Does risk assessment of knowledge-based firms differ from risk assessment of less knowledge-intensive firms and, if so, how?

**Q8** Are there differences between lending decisions of chartered banks and lending decisions of government agencies? If differences exist, to what extent can they be explained by differences in institutional structures, loan evaluation and decision-making processes?

**Q9** Does a common or shared lending culture exist among account managers in chartered banks and government agencies?

**Q10** To what extent does the lending culture within chartered banks and government agencies reflect the needs of KBBs?

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<sup>1</sup> Research question Q7 is not included since data limitations prevented the analysis necessary to address this issue.

To determine whether or not differences in risk assessment exist between KBBs and less knowledge-intensive firms, the study analyzed account managers' risk ratings and proposal ratings. Findings indicate there are significant differences in risk assessment between bank account managers and account managers in government agencies. Bank account managers perceive higher levels of firm risk (mean difference = 1.02,  $p < .05$ ) and are more concerned with the financial aspects of the proposals, namely collateral, cash flow, and equity. Findings also indicate differences in risk assessment of KBBs. Specifically, KBB specialists perceived significantly lower levels of risk with the KBB proposal than the generalist account managers who reviewed the more traditional proposal (mean difference = -1.63,  $p < .01$ ). Further, those who reviewed the KBB proposal and those with a KBB focus were significantly more positive in their ratings than were account managers who reviewed the traditional plan. On the basis of these findings, it is reasonable to conclude risk assessment of KBBs differs from risk assessment of more traditional firms.

The review of the decisions and recommendations of account managers indicates government account managers were more favourably disposed to both proposals than bank account managers. This is consistent with the survey findings indicating entrepreneurs have been more successful obtaining financing from government agencies than from chartered banks. Further investigation also confirms that the basis for government support relates largely to institutional mandates of, and types of financial assistance available from, government agencies compared to chartered banks. There was no evidence to indicate that differences in support between chartered banks and government agencies had anything to do with differences in institutional structures and processes. Similarly, there was no evidence lending decisions and recommendations were influenced by the nature of the proposal. Thus,

based on the findings of this study, differences in lending decisions cannot be explained by differences in institutional structures, loan evaluation and decision-making processes.

This thesis also attempted to determine whether or not a common lending culture exists within financial institutions and to assess the extent to which the lending culture reflects the needs of KBBs. To do this, the study employed consensus analysis to assess the extent of intra-cultural variability within various a priori groups of account managers at two stages of assessment, initial review and post review. Summary results of the consensus analysis at both stages are presented in Table 7.1.

**Table 7.1**  
**Consensus Analysis Results – Initial and Post Reviews**  
**All Account Manager Groups**

Group	Initial Review		Post Review	
	Ratio	n	Ratio	n
Overall	2.199	20	2.761	23
Government	1.536	7	2.398	9
Banks	1.678	12	2.450	13
Traditional Proposal	1.494	10	<b>3.301</b>	10
KBB Proposal	<b>3.687</b>	9	2.272	12
KBB Specialists	<b>4.687</b>	4	<b>100.0%<sup>2</sup></b>	5
Generalists	2.100	15	<b>3.221</b>	17
Gov't minus BDC	1.119	5	<b>100.0%</b>	6
Banks minus KBB	1.028	10	<b>3.494</b>	11

Note: cases highlighted in bold indicate consensus.

Results at the initial review stage indicate considerable diversity among account managers, with the exception of two groups, those that reviewed the KBB proposal (eigenvalue ratio = 3.687) and those with a KBB focus (eigenvalue ratio = 4.687). A high level of agreement among the members of these groups is an indication of

<sup>2</sup> Indicates all of the variance is explained by one factor.

consensus. However, agreement does not necessarily imply a lending culture reflective of the needs of KBBs. Findings based on further investigation of the factors underlying consensus at the initial review stage indicate consensus is reflected in a very mixed view of proposal attributes with approximately half of the variables viewed more positively by these two groups of account managers and half viewed more negatively. As a result, although there is agreement, the lending culture at this stage is not supportive of the needs of KBBs.

A review of Table 7.1 confirms the level of agreement among all groups of account managers, except those that reviewed the KBB proposal, increased from the initial review to the post review stage. In addition, findings indicate consensus at the post review stage among account managers in a number of notable groups, such as government agencies with a shared economic development mandate (100%), traditional commercial bank account managers (eigenvalue ratio = 3.494), and account managers with a KBB focus (100%). Results of the factor analysis, demonstrating convergence among the rating variables at the post review stage compared to the initial review, also provide support for the finding of an increased level of agreement and consensus. Overall, these findings provide strong support for the conclusion of a shared lending and risk assessment culture at the post review stage. Again, further investigation of the factors underlying consensus reveals mixed results among the groups concerning the extent to which the culture reflects the needs of KBBs. Nonetheless, the positive perceptions of specialist account managers, those with a KBB focus, provide some support for the existence of a KBB lending culture.

Finally, study results confirmed very low correlations between account managers' initial and post review ratings of the majority of proposal attributes. This finding indicates account managers modify their perceptions of certain aspects of the

proposals significantly based on the results of their due diligence. In cases where there are significant correlations between ratings at the two stages, at least two explanations are possible. On the one hand, it may be that subsequent due diligence confirms initial perceptions. On the other hand, it is entirely possible that account managers are predisposed to particular views and are reluctant to modify initial perceptions, for whatever reasons. In any event, it is reasonable to conclude that, at least in some areas, subsequent due diligence has a significant impact on loan evaluation and risk assessment.

## **7.2 Limitations**

A study of this magnitude is bound to have limitations and this thesis is no exception. As with the findings, limitations are presented and discussed under the two main components of the study: the demand-side survey and the supply-side interviews and verbal protocols.

### **7.2.1 The Survey**

Three interrelated issues concerning the sampling procedure and representativeness of respondents were identified. First, sampling was done on a purposeful rather than random basis. The database chosen for the mail survey was intended to ensure adequate representation of high knowledge firms or KBBs. The firm population in Newfoundland and Labrador was 17,776 firms in December of 1999. Random sampling from a population this size would require an extremely large sample size to mitigate the risk of inadequate representation of critical cases necessary to the

investigation.

The second issue concerns the response rate of 16 percent, low by survey standards and certainly less than ideal for statistical inference. The issue of the representativeness of respondents was discussed previously but deserves mention again. No data were available on the database used for the mailing. Thus, it is not possible to determine the extent to which respondents are representative of firms surveyed. The comparison of respondents to firm population data using number of employees, geographic location and industry sector confirms survey respondents are not representative of the entire population of firms in this Province. This is not surprising since the primary objective of the sample selection was to ensure critical cases were included to facilitate comparison among firms by level of knowledge-intensity. The study achieved the desired heterogeneity in terms of level of knowledge-intensity. Nonetheless, potential response bias and generalizability are limitations to the external validity of the survey findings.

The third issue regarding the sample concerns the exclusion of certain cases, specifically non-starts, which include entrepreneurs that attempted to access financing but were unsuccessful, and businesses that have closed. None of these groups were included in the survey. As a result, study findings concerning access to institutional financing do not consider differences that may exist between KBBs and traditional firms that do not make it to the start-up stage or that subsequently cease operations.

A final issue concerns the data and the impact of large outliers that distort means for some of the financial figures. High standard deviations are a clue to this problem and have been noted in Table 5.11 and Table 5.21 for the amounts of financing requested from chartered banks and government agencies. Medians, as well as means, have been reported in both instances to provide a more complete picture of the data. A



review of the data indicates outliers are represented in the high knowledge group and in the medium and low knowledge group. As a result, the impact of these outliers on comparisons between groups is likely to be minimal.

### **7.2.2 Interviews and Verbal Protocols**

There are also a number of limitations concerning the supply-side interviews and verbal protocols used in the study. First, the volume of data posed a significant challenge to analyze. While considerable effort was made to systematically describe, interpret and link various qualitative data, there is always the potential for researcher bias. Second, interviewer bias can also be a problem with the collection of data. The use of verbatim transcripts for interviews and verbal protocols, and the use of semi-structured interview protocols mitigated the potential errors resulting from noninteractional effects, such as errors in observation. The more problematic bias, involving the potential effects of the researcher on the behaviour of account managers during the conduct of the simultaneous verbal protocols, was minimized by ensuring the researcher did not intervene in the process. Further, as indicated in the methodology chapter, Schweiger (1983) and Ericsson and Simon (1980) addressed the obtrusive nature of the simultaneous verbal protocol and concluded their use is unlikely to have any effects on participant performance.

Third, the time frame over which the interviews and business plan experiments were conducted is a limitation that poses a potential threat to the internal validity of the study. Interviews with senior managers took place in March and April, 2000. Verbal protocols and interviews with account managers were completed over the period from November 2000 to May 2001. Two developments occurred during that timeframe that

may have affected institutional lending decisions. As indicated previously, three chartered banks reported that their strategies for dealing with KBBs were evolving and that restructuring underway during this time period might affect their approach to the KBB market. A number of changes at the senior management levels within the chartered banks and government agencies over the study period compounded this issue. Post review interviews with account managers who reviewed the KBB proposal provided a check on these developments. Nonetheless, it is possible that changes in organizational frameworks, including strategies and structures, occurred that are not reported here.

The second development of some concern was the significant market decline of publicly traded technology-based firms that occurred during the period when the business plan reviews took place. This is unlikely to have affected ratings of the vast majority of account managers from the initial to the post review stage, since the process with each individual took place over a relatively short time frame. However, it may be a factor explaining differences among account managers, especially those participating in November 2000 compared to those who completed their reviews in April 2001.

A fourth limitation with the supply-side component of the study is the relatively small sample size. As indicated previously, Weller and Romney (1988) provide support for using consensus analysis with small groups. Nonetheless, there are a number of subgroups of account managers, most notably the KBB specialists, where the number of participants is extremely small and where caution should be exercised in interpretation as a result. The small sample size is also a limitation to the use of standard multivariate analysis and statistical tests. In some cases, for example when using discriminant analysis to identify potential explanatory variables underlying the business plan assessments by various subgroups, no statistical differences were found.

In these cases, the absence of differences may be explained by the low power of the statistical tests. Thus it is not possible to state conclusively that significant differences do not exist. Conversely, low power increases confidence in findings where significant differences were found.

Small sample size is also a limitation to generalizability. As an exploratory study, findings from this thesis must be interpreted in the context of institutional lending in Newfoundland and Labrador. Thus, not only are there limitations associated with the small sample size but there are also limitations arising from the geographic setting. The research confirmed there are other locations where institutional approaches to KBB lending are more highly developed than in this Province. Findings from this study would not apply in those situations. However, a more reasonable question is the extent to which findings from this study are generalizable to other peripheral locations, where KBB lending is less highly developed?

A fifth limitation concerns the experimental nature of the business plan review process and the use of hypothetical cases. Observation in a field setting through the use of simultaneous verbal protocols was designed to increase reliability and to provide details of the lending process. This was achieved in the present study. However, as mentioned previously, the hypothetical nature of the business plans may have limited account managers from engaging in the full due diligence and decision-making process. It also prevented consideration of the role of the entrepreneurs and their relationships with financial institutions in the lending decision. Given the importance accorded the entrepreneur in previous research dealing with risk assessment criteria (Petty and Upton, 1997; Thompson, Lightstone and Co. Ltd., 1998), the absence of the entrepreneurial element must be acknowledged as a limitation of this thesis. Otherwise, conclusions are based on the assumption all account managers treated the experiment in

a professional manner and acted, insofar as possible, in accordance with their normal credit decision-making processes.

### **7.3 Implications**

In any research endeavour, it is important to identify the implications of the findings and their contribution to the development of theory, management practice and policy making. Each of these is addressed below for this thesis.

#### **7.3.1 Implications for Theory**

The exploratory framework utilized in this study builds on previous research in the venture capital area by recognizing the potential multi-dimensional and multi-stage nature of institutional lending. The framework explores the importance of interrelationships within and among the various components of the lending process by integrating the supply-side dimensions of organizational frameworks, decision-making processes, and loan evaluation processes of lending institutions with the demand-side experiences of entrepreneurs. This thesis makes an important contribution by using this framework to examine lending decisions in context and with reference to specific proposals, rather than in isolation and retrospectively, as has been the case with the vast majority of previous studies dealing with institutional lending. The study is also one of very few to explore lending and borrowing in the context of knowledge-based businesses. Similarly, no prior studies have examined risk assessment from the perspective of government agencies.

In terms of the demand-side, the findings from this research provide additional empirical evidence of the experiences of knowledge-based businesses with obtaining financing from chartered banks and government agencies. To date, research in this area has been extremely limited. Findings concerning the roles played by the chartered banks and government agencies provide confirmation of previous research (Thompson, Lightstone and Company, 1998; Industry Canada, 1994a), indicating the role of financial institutions has not been as prominent in financing KBBs as it has been in financing more traditional firms. Findings concerning the experiences of KBBs with obtaining financing from chartered banks and government agencies and with KBB perceptions of lending institutions provide new insights fundamental to understanding the needs of knowledge-based firms. Evidence indicates KBBs have experienced greater difficulty obtaining chartered bank financing and attribute much of that difficulty to the banks' emphasis on collateral. Previous studies by Binks *et al.* (1992) and Thompson, Lightstone and Company (1998) report similar problems for KBBs in their dealings with banks. Given the growing importance of the KBB sector to the economy, these findings provide both confirmation and valuable insights.

Survey findings also raise important questions concerning the financing needs of KBBs and the extent to which requests for financing may be influenced by assumed outcomes and by expectations of how they will be received by financial institutions, especially chartered banks. Recent work by Levenson and Willard (2000), measuring credit rationing experienced by small firms in the United States, similarly argues for the need to include creditworthy firms that decide not to apply for desired external financing for a variety of reasons. Unfortunately, their study was unable to distinguish empirically between creditworthy and non-creditworthy firms. Questions concerning the financing needs and expectations of SMEs generally, and KBBs in particular,

require additional research.

Notwithstanding the importance of demand-side findings, this thesis makes its most significant contribution to understanding the supply-side of institutional lending, especially loan evaluation and risk assessment. The literature review identified only three previous studies (Leblebici and Salancik, 1981; Fletcher, 1995; McNamara and Bromiley, 1997) that use a grounded approach, as in this study, to examine lending processes of banks. The study by Fletcher (1995) is the only one of these that investigates lending decisions at two-stages, as done in this thesis. Further, none of the previous studies examined lending in the context of KBBs and no studies were identified that deal with the lending processes of government agencies. As a result, this exploratory study represents an important step in developing theory on lending to knowledge-based businesses.

In terms of contribution to the wider body of knowledge, findings from this thesis confirm the multi-dimensional nature of the lending process in terms of multi-stages, multi-persons and multi-criteria. Findings also support the need to integrate multiple theoretical perspectives from financial theory, credit rationing theory and commercial lending to understand lending and financing processes. As suggested recently by Zingales (2000: 1623), "... although existing theories have delivered very important and useful insights, they seem quite ineffective in helping us cope with the new type of firms that is emerging." To Zingales, these new firms are human capital-intensive entities where financing and governance choices can easily change organizational boundaries, thus necessitating new theoretical perspectives.

Thesis findings confirm the existence and importance of information asymmetry and adverse selection (Akerlof, 1970) to the lending decision. However, the information asymmetry problems do not relate to issues such as moral hazard, incentive

effects and monitoring and bonding costs as posited by agency theory (Jensen and Meckling, 1976) but rather to the uncertainties and differing expectations associated with predicting future outcomes (Philpott, 1995). Although not limited to knowledge-based businesses, these uncertainties are more evident and more problematic for new firms operating in innovative growth sectors, as is the case for many KBBs. Given the research design and the fact banks were unwilling to extend credit to either of the two proposed ventures, the study was not able to determine the influence of agency costs and the associated problems of moral hazard.

Findings also support credit rationing theory, as posited by Jaffe and Russell (1976), confirming that banks ration credit in response to information asymmetry and adverse selection. Collateral is necessary but not sufficient, except perhaps at the extreme, and does not mitigate the need to ration credit as suggested by Stiglitz and Weiss (1981) and others (Bester, 1987; Chan and Kanatas, 1985). Banks rely on organizational frameworks, especially structures and processes, to deal with information asymmetry. Study findings confirm the work of McNamara and Bromiley (1997) indicating the importance of such organizational variables to loan evaluation and decision-making, although not specifically to KBBs. While the influence of cognitive factors, such as the fads-and-fashions effect (McNamara and Bromiley, 1997) cannot be ruled out, the research design likely would have minimized such effects on lending decisions, especially between the two proposals.

This study also makes a noteworthy contribution to research methodology. Perhaps, the most significant contribution concerns the use of cultural consensus theory to describe and measure the extent to which there is shared knowledge and a lending culture among account managers in chartered banks and government agencies and the extent to which the lending culture differs for knowledge-based businesses. The

literature review indicates no similar application of consensus analysis has been attempted by others.

The use of consensus analysis in this study reveals significant findings concerning loan evaluation and risk assessment. While the consensus model cannot confirm the existence of common culture, it can demonstrate when data are inconsistent with its existence. At the overall level, data from this study are inconsistent with the existence of a common lending culture among all account managers. However, at the more critical subgroup level, findings demonstrate the data are not inconsistent with consensus and a shared lending culture. There are groups of account managers that demonstrate a high level of agreement in terms of risk assessment. This is the case for account managers in government agencies that have a shared mandate to support economic development in the Province. The same is true for traditional account managers in chartered banks where lending policies and procedures are well established. Finally, and most importantly to KBBs, findings provide some support for consensus among the specialist account managers, and for the existence of a lending culture that is consistent with the needs of knowledge-based businesses. This consensus is reflected in perceptions of lower risk levels by KBB specialists and by significantly more positive ratings of the KBB proposal, findings that indicate risk assessment of KBBs differs from risk assessment of more traditional firms.

Findings concerning risk assessment by bank account managers also provide confirmation of results from previous research (Fletcher, 1995) indicating the importance of financial variables, especially collateral, cash flow and equity (leverage). In contrast, government account managers emphasize non-financial variables, appear to be less risk averse, and are generally more forthcoming with financial assistance. Although somewhat intuitive, the findings concerning government account managers



provide new insights into risk assessment in the context of government agencies.

Finally, use of the two-stage approach to risk assessment in this study revealed important findings concerning the due diligence process and its impact on loan evaluation and risk assessment. Low correlations between ratings at the two stages for some variables confirm the importance of subsequent due diligence. On the other hand, there are a number of potential explanations for high correlations between ratings for other variables. One possibility is the due diligence process confirms initial perceptions. A second possibility is the initial assessment of certain attributes is more heavily influenced by predispositions. Still a third explanation is that account managers, for whatever reasons, are hesitant to modify initial perceptions, even when due diligence might suggest otherwise. Further research is needed to explore each of these, as well as other potential explanations for variations in risk assessment at various stages of loan evaluation.

### **7.3.2 Implications for Management Practice**

The research findings also have significant implications for lending institutions and for entrepreneurs in knowledge-based businesses in search of debt financing. Lending institutions, particularly chartered banks, have made efforts to modify lending practices to accommodate the needs of knowledge-based businesses. Most offer products and services designed specifically to meet the needs of KBBs. In some jurisdictions, they also have established lending centres with account managers trained to handle specialist aspects of loan evaluation, such as technology assessment and intellectual capital valuation.

Notwithstanding these efforts, KBBs in this study report a number of significant differences in their dealings with chartered banks compared to more traditional firms that should be of particular interest to the banks. Specifically, KBBs rely less on chartered banks for financing, experience more difficulty obtaining financing from chartered banks, and perceive the banks to place greater emphasis on collateral. These findings suggest the banks have been less than successful in their efforts to cater to the needs of KBBs, at least in the opinion of this sample of clients. Assuming these findings represent the experiences and perceptions of KBBs generally, the banks may wish to examine the extent to which they practice what they preach in terms of lending to the knowledge-based sector in this Province.

Study findings also have a number of important implications for entrepreneurs in knowledge-based businesses in search of financing in this Province. First, chartered banks are low risk lenders that emphasize financial criteria, especially, collateral, cash flow and equity. As a result, they are unlikely to represent a significant source of start-up capital, especially for KBBs. Second, while KBBs are more likely to be successful obtaining financing from government agencies, the types of financing available usually are not appropriate or not sufficient to meet operating requirements. Some government agencies are excellent sources of financing for soft costs, such as research and development expenditures but government agencies generally are not potential sources of financing for working capital or operating capital requirements. Thus, personal sources and chartered banks continue to be important to KBBs. Alternatively, small firms are forced to rely on financial bootstrapping methods<sup>3</sup> as outlined by Winborg and Landstrom (2001). To date, there has been limited research on the role and importance of financial bootstrapping to small firms.

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<sup>3</sup> The authors identify 32 bootstrapping methods consisting of internally oriented and socially oriented resource acquisition strategies used in lieu of external long-term finance.

Third, the lending practices of chartered banks and government agencies are evolving to meet the needs of KBBs. This study has provided evidence that risk assessment of KBBs differs from that of traditional firms. The study also demonstrated support for the existence of a lending culture consistent with the needs of KBBs. Unfortunately for entrepreneurs, there is limited evidence to date that these practices and this culture have been successful in meeting the needs of KBBs, likely because the culture is confined to a very select group of account managers. This study was able to confirm only three account managers in this Province with a focus on knowledge-based businesses. Entrepreneurs in KBBs are well advised to ensure their proposals garner the attention of these specialists.

### **7.3.3 Implications for Policy**

Considering the importance of knowledge-based businesses to the economy, findings from this study also have important implications for the development of public policy. As indicated previously, knowledge-based businesses are especially important to peripheral regions and areas with marginal economies, such as Newfoundland and Labrador, since they offer the potential to overcome many of the barriers to entry and competitive disadvantages faced by traditional businesses. Nonetheless, it is apparent from the findings of this study that access to financing, especially operating capital from chartered banks, presents a major challenge to KBBs, particularly at the start-up stage. Since the Province is not in the mainstream of economic activity, it is unlikely to see the chartered banks respond by establishing specialized lending centres, as they have in other locations where there are significant clusters of KBBs. Thus, alternative approaches are needed. Government should continue to encourage the chartered banks

to extend efforts to provide the specialized expertise needed to deal with financing applications from knowledge-based businesses. Initiatives need not be as grandiose as establishing dedicated lending centres. They could consist of merely providing specialized training to a few select account managers. However, at a minimum, the objective should be to ensure specialized expertise is available in the Province to meet the needs of KBBs.

Second, government should also take steps to ensure the availability of similar requisite expertise among account managers in the various agencies that provide assistance to knowledge-based businesses. While there is some limited specialization and focus on KBBs in government agencies, only one provides specialized training to account managers to support their dealings with knowledge-based businesses.

Finally, government should identify and address supply-side financing gaps to support the start-up of knowledge-based businesses. Such efforts should not be limited to the direct provision of financing but should include ways of supporting and encouraging the flow of private capital to this critical sector of the economy. Guarantee mechanisms<sup>4</sup>, such as the Canada Small Business Financing Program (formerly the Small Business Loans Act) in Canada, have been shown to be an effective means of supporting the start-up, growth and survival of new and risky ventures (Riding and Haines, 2001) and should be continued.

#### **7.4 Future Research**

As an exploratory study, it is not surprising that this thesis raises numerous questions in the process of providing answers to others. Some of these represent new

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<sup>4</sup> Under the terms of the Canada Small Business Financing Program, the federal government guarantees 85% of term loans by designated financial institutions to small firms to a maximum of \$250,000.

but related opportunities for inquiry. Others represent issues addressed in this thesis but requiring further study, largely as a result of limitations identified previously. It is this latter area that is the focus of the following discussion of future research. As a result, these suggestions are designed primarily to enhance the present study or to provide confirmation of its findings.

Given the low response rate to the mail survey, replicating the study, especially in other peripheral regions, could not only provide confirmation of findings but also enhance generalizability. Also, it would be most useful to conduct some follow-up interviews or possibly case studies to explore financing issues and perceptions in greater depth. For example, the question of the potential impact of perceived outcome on amount of financing requested, mentioned previously, would be an ideal issue to explore further in an interview with entrepreneurs. Including some non-starts and some cases where firms have ceased operations also would be useful but often impractical, given the difficulties of contacting the principals involved and of obtaining their co-operation.

Replication of the supply-side of the study is also necessary to confirm findings and address generalizability. It is especially important to conduct the business plan experiments with a larger group of specialist account managers, since findings concerning this group are critical to establishing whether or not consensus and a lending culture exist in the context of knowledge-based businesses. Including more KBB specialists from chartered banks would be particularly helpful, since only two participated in the present study.

A final suggestion concerns methodology. In this study, the risk assessment criteria, or elements of the lending domain, were drawn from the literature. Ideally, the cultural domain should be defined by the study participants. Doing so ensures the

dimensions reflect the experience and reality of account managers. Respondents were given the opportunity to add to the list of variables, however, few chose to do so. Thus, it is unlikely that there are critical omissions. Nonetheless, utilizing an approach, such as the Free List technique<sup>5</sup>, to elicit risk assessment criteria from account managers would strengthen this aspect of the study.

## 7.5 Conclusion

A major goal of this research has been to increase our understanding of lending to knowledge-based businesses. Given the lack of a theoretical framework, an exploratory research approach was utilized to examine the supply-side perspectives of lending institutions and the demand-side perspectives of entrepreneurs. The study employed a mix of qualitative and quantitative research methods, including field observations using simultaneous verbal protocols, semi-structured interviews and a mail survey. As with any exploratory study, there are limitations but, overall, study findings provide important insights into institutional lending and have significant implications for theory, management practice and public policy. However, these findings are by no means definitive. The challenge is to continue the research undertaken in this study to provide confirmation of results and to increase generalizability of study findings.

Small firms have traditionally faced problems accessing financing, especially at the start-up stage. It appears those problems may have grown with the shift to a knowledge-based economy. Part of the problem is traditional lending models are no longer appropriate. At the same time, these new economy firms offer significant

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<sup>5</sup> According to Borgatti, "The technique basically consists of asking a small set of respondents (say 30) to name (or, ideally, write down) all items matching a given description" (1996b: 1).

potential for economic development, especially in peripheral locations, such as Newfoundland and Labrador. To stimulate growth of these knowledge-based businesses, it is essential for lending institutions to increase their activity in this sector. Research, such as that undertaken in this study, provides the foundation fundamental to achieving this goal.

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**APPENDIX 4.1**

**SURVEY OF THE FINANCING EXPERIENCES OF  
SMALL AND MEDIUM-SIZED FIRMS  
IN NEWFOUNDLAND AND LABRADOR**

**A SURVEY OF THE FINANCING  
EXPERIENCES OF SMALL AND MEDIUM-  
SIZED FIRMS IN NEWFOUNDLAND AND  
LABRADOR**



**PLEASE CONSIDER PARTICIPATING IN THIS RESEARCH PROJECT BY  
COMPLETING THE ENCLOSED SURVEY. YOUR INPUT IS ESSENTIAL TO  
UNDERSTANDING THE NEEDS OF SMALL AND MEDIUM-SIZED FIRMS**

**THE INFORMATION PROVIDED IN THIS SURVEY WILL BE HELD IN  
STRICTEST CONFIDENCE**

**Part I. This section includes questions about you and your business.**

1. Please briefly describe the primary type of business that you operate.

\_\_\_\_\_

\_\_\_\_\_

2. Please indicate the Standard Industrial Classification (SIC) or the North American Industrial Classification System (NAICS) codes for your business in order of importance.

i. \_\_\_\_\_

ii. \_\_\_\_\_ Check here if you are not aware of the applicable codes.

iii. \_\_\_\_\_

3. In what year was this business established? \_\_\_\_\_

4. Are you the principal owner of this business? Yes  No  (If no, please specify your position \_\_\_\_\_ and go to question 6)

5. Did you start  or buy  or inherit  this business?

6. How long have you been involved in this business? \_\_\_\_\_

7. What is your gender and age? Male  Female  Age: \_\_\_\_\_

8. How many years of previous business experience did you have before getting involved in this business? \_\_\_\_\_

9. How many years of previous experience did you have in this type of industry (or related industry) before getting involved in this business? \_\_\_\_\_

10. Please indicate your educational background at the time of getting involved in this business.

- did not complete high school
- high school graduate
- trade school or college graduate
- university undergraduate degree
- university graduate degree
- professional designation  (specify: \_\_\_\_\_)

11. Please indicate the ownership structure of this company.

- corporation  (year incorporated \_\_\_\_\_)
- partnership
- proprietorship
- other  (specify: \_\_\_\_\_)

12. What is the postal code in your business address? \_\_\_\_\_

13. How many people did you employ during your last fiscal year and during your first fiscal year?

<u>Last Year</u>		<u>First Year</u>
_____ full-time people		_____ full-time people
_____ part-time people		_____ part-time people

14. Please indicate the firm's approximate gross sales or revenues for the last fiscal year.

No revenues	Γ	>\$500,000 to \$1,000,000	Γ
Less than \$250,000	Γ	>\$1,000,000 to \$5,000,000	Γ
\$250,000 to \$500,000	Γ	over \$5,000,000	Γ

15. Please provide the following information for this business for the last fiscal year:

- a. the dollar amount of research & development (R & D) expenditures \_\_\_\_\_
- b. research & development expenditures as a percent of gross sales or revenues \_\_\_\_\_
- c. the percent of all employees employed in the research & development area \_\_\_\_\_
- d. percent of R & D employees with university-level degrees \_\_\_\_\_
- e. scientists and engineers as a percent of the total number of employees \_\_\_\_\_
- f. percent of all employees with bachelors degrees \_\_\_\_\_
- g. percent of all employees with graduate degrees (masters & PhDs) \_\_\_\_\_
- h. percent of all employees with post-secondary diplomas \_\_\_\_\_

16. In your opinion how important is each of the following to success in this type of industry?

	1=not important			5=very important	
a. research & development activity	1	2	3	4	5
b. patents obtained	1	2	3	4	5
c. innovative products and processes	1	2	3	4	5
d. intangible assets (whether or not they appear on the balance sheet)	1	2	3	4	5
e. highly educated work force	1	2	3	4	5
f. ability to compete internationally	1	2	3	4	5

17. Please indicate the extent to which each of the following statements applies to your firm.

	1=does not apply			5=applies very well	
a. invests heavily in R & D	1	2	3	4	5
b. exhibits a high level of innovation	1	2	3	4	5
c. depends heavily on human capital	1	2	3	4	5
d. has the potential to grow rapidly	1	2	3	4	5
e. has a high proportion of intangible assets	1	2	3	4	5
f. success is based primarily on knowledge	1	2	3	4	5

**Part II. This section includes questions about your firm's access to financing, in particular financing from chartered banks and government departments and agencies.**

18. What was the initial capitalization (the amount of capital borrowed and invested, including assets transferred to the business) of this business at start-up? \_\_\_\_\_

19. Please indicate the dollar amount or percent of total start-up capital (including assets transferred to the business) obtained from each of the following sources:

	\$	OR	%
personal sources	_____		_____
loans from friends and relatives	_____		_____
investment by friends and relatives	_____		_____
chartered bank loans	_____		_____
loans from government departments or agencies	_____		_____
grants from government departments or agencies	_____		_____
venture capital	_____		_____
other private investors	_____		_____
other (specify: _____)	_____		_____

20. Have you attempted to access chartered bank financing for this business at any time?

Yes

No  (if no, please explain why not and then go to question 39)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## FINANCING FROM CHARTERED BANKS

**PLEASE RESPOND TO QUESTIONS 21-38 ON THE BASIS OF THE FIRST TIME THAT YOU ATTEMPTED TO ACCESS BANK FINANCING FOR THIS BUSINESS.**

21. Please indicate the age of this business at the time you first attempted to access bank financing for the business. \_\_\_\_\_

22. Please indicate the firm's approximate annual gross sales or revenues at the time you first attempted to access bank financing for the business.

No revenues	<input type="checkbox"/>	>\$500,000 to \$1,000,000	<input type="checkbox"/>
Less than \$250,000	<input type="checkbox"/>	>\$1,000,000 to \$5,000,000	<input type="checkbox"/>
\$250,000 to \$500,000	<input type="checkbox"/>	over \$5,000,000	<input type="checkbox"/>

23. Please indicate the stage of development of this business at the time you first attempted to access bank financing for this business.

idea/startup  product/market development  growth/expansion  mature/stable

24. How many banks did you contact in the attempt to obtain financing? \_\_\_\_\_

25. Were any of the bank branches and account managers you dealt with located outside Newfoundland & Labrador?

Yes  (please indicate location \_\_\_\_\_)  
No

26. Please indicate the types and amounts of financing requested.

	Amount		Amount
Operating line of credit	<input type="checkbox"/> _____	Export financing	<input type="checkbox"/> _____
Term financing	<input type="checkbox"/> _____	R & D financing	<input type="checkbox"/> _____
Contract financing	<input type="checkbox"/> _____	SBLA financing	<input type="checkbox"/> _____
Commercial mortgage	<input type="checkbox"/> _____	Other	<input type="checkbox"/> _____
		(specify: _____)	

27. How many banks were willing to provide financing? \_\_\_\_\_



28. In your opinion how important were the following factors to the bank(s) in making a decision on your application for financing?

	1=not important			5=very important	
a. past relationship with the bank	1	2	3	4	5
b. market potential	1	2	3	4	5
c. completed business plan	1	2	3	4	5
d. type of industry	1	2	3	4	5
e. collateral/security available	1	2	3	4	5
f. proven product/service	1	2	3	4	5
g. other funding available	1	2	3	4	5
h. stage of development of the business	1	2	3	4	5
i. track record of the entrepreneur	1	2	3	4	5
j. uniqueness of product/service	1	2	3	4	5
k. potential cash flow	1	2	3	4	5
l. management team	1	2	3	4	5
m. demonstrated market acceptance	1	2	3	4	5
n. general economic conditions	1	2	3	4	5
o. other (specify _____ _____)	1	2	3	4	5

29. From the previous list, please indicate the two most important factors (insert letters).

1. \_\_\_\_\_ 2. \_\_\_\_\_

30. Please indicate which statement best describes your first attempt to access bank financing.

- Eventually obtained the full amount requested
- Eventually obtained some financing but less than requested  (% obtained: \_\_\_\_\_)
- Was not successful at obtaining any bank financing  (go to question 38)

31. Please indicate which bank provided financing. \_\_\_\_\_

32. Are you still dealing with this bank? Yes  No   
(if no, please indicate the reason for the change) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## FINANCING FROM GOVERNMENT DEPARTMENTS AND AGENCIES

39. Please indicate which of the following organizations you have approached for financing.

- |  |                          |
|--|--------------------------|
| Atlantic Canada Opportunities Agency (ACOA)  | <input type="checkbox"/> |
| Business Development Bank of Canada (BDC)<br>(formerly Federal Business Development Bank - FBDB)               | <input type="checkbox"/> |
| Department of Development and Rural Renewal (DDRR)<br>(or the former Enterprise Newfoundland & Labrador - ENL) | <input type="checkbox"/> |
| Department of Industry, Trade & Technology (DITT)  | <input type="checkbox"/> |
| Industry Canada  | <input type="checkbox"/> |
| National Research Council (NRC)  | <input type="checkbox"/> |
| Other (specify _____)  | <input type="checkbox"/> |

If you did not seek funding from any of these organizations, please indicate why not and then please go to question 53.

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**PLEASE RESPOND TO QUESTIONS 40-52 ON THE BASIS OF THE FIRST TIME THAT YOU ATTEMPTED TO ACCESS FINANCING FROM ANY OF THESE ORGANIZATIONS.**

40. Please indicate the age of this business at the time you first attempted to access financing from any of these organizations. \_\_\_\_\_

41. Please indicate the stage of development of this business at the time you first attempted to access financing from any of these organizations.

idea/startup     product/market development     growth/expansion     mature/stable

42. Please indicate the firm's approximate annual gross sales or revenues at the time you first attempted to access financing from any of these organizations.

No revenues	<input type="checkbox"/>	>\$500,000 to \$1,000,000	<input type="checkbox"/>
Less than \$250,000	<input type="checkbox"/>	>\$1,000,000 to \$5,000,000	<input type="checkbox"/>
\$250,000 to \$500,000	<input type="checkbox"/>	over \$5,000,000	<input type="checkbox"/>

43. Please indicate the types and amounts of financing requested.

Amount		Amount	
Operating line of credit	<input type="checkbox"/> _____	Export financing	<input type="checkbox"/> _____
Term financing	<input type="checkbox"/> _____	R & D financing	<input type="checkbox"/> _____
Contract financing	<input type="checkbox"/> _____	SBLA financing	<input type="checkbox"/> _____
Commercial mortgage	<input type="checkbox"/> _____	Other	<input type="checkbox"/> _____
		(specify: _____)	

44. For those organizations contacted, please indicate which statement best describes your attempt to access funding.

	received full funding requested	received partial funding	did not receive funding
Atlantic Canada Opportunities Agency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business Development Bank of Canada (formerly FBDB)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Department of Development and Rural Renewal (or the former ENL)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Department of Industry, Trade & Technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industry Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National Research Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

45. In your opinion how important were the following factors to the above organizations in making a decision on your application for financing?

	1=not important		5=very important		
a. past relationship with the organization	1	2	3	4	5
b. market potential	1	2	3	4	5
c. completed business plan	1	2	3	4	5
d. type of industry	1	2	3	4	5
e. collateral/security available	1	2	3	4	5
f. proven product/service	1	2	3	4	5
g. other funding available	1	2	3	4	5
h. stage of development of the business	1	2	3	4	5
i. track record of the entrepreneur	1	2	3	4	5
j. uniqueness of product/service	1	2	3	4	5
k. potential cash flow	1	2	3	4	5
l. management team	1	2	3	4	5
m. demonstrated market acceptance	1	2	3	4	5
n. general economic conditions	1	2	3	4	5
o. other (specify _____ _____)	1	2	3	4	5

46. From the previous list, please indicate the two most important factors (insert letters).

1. \_\_\_\_\_ 2. \_\_\_\_\_

If you did not receive funding from any of these organizations, please go to question 52.

47. Were you able to obtain the funding on satisfactory terms?

Yes

No  (if no, please indicate in what way the terms were not satisfactory)

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48. Was the business required to provide collateral as security for any funding received?

Yes  (if yes, please specify the security \_\_\_\_\_)

No





**Please return to:**

**Gary Gorman, Associate Professor  
Faculty of Business Administration  
Memorial University of Newfoundland  
St. John's, NF A1B 3X5**

**Phone: 709-737-3311**

**Fax: 709-737-7680**

**E-mail: [ggorman@morgan.uccs.mun.ca](mailto:ggorman@morgan.uccs.mun.ca)**



**APPENDIX 4.2**  
**PROTOCOL FOR PILOT TEST OF MAIL SURVEY**

## **PROTOCOL FOR PILOT TEST OF MAIL SURVEY**

- 1. Was the purpose of the study clear?**
- 2. Were the instructions clear?**
- 3. Were any of the questions difficult to understand?**
- 4. Was any of the information difficult to obtain or recall?**
- 5. Did you have any difficulty with the explanation of initial capitalization (Q. 19)?**
- 6. Did the stages of business development (Q. 24 & 42) appear reasonable and sufficient for you to differentiate among them?**
- 7. Were you familiar with the acronym (SBLA) used in Q. 27 & 44?**
- 8. Were there any other terms that were difficult to understand?**
- 9. Did the 5-point rating scales provide sufficient variation for your responses?**
- 10. How long did it take to complete the survey?**
- 11. Did you have any other concerns or problems with the survey?**

**APPENDIX 4.3**

**COVER LETTER TO ACCOMPANY MAIL SURVEY**

February 15, 1999

«Contact\_Name», «Position»  
«Company»  
«Address\_1»  
«Address\_2»  
«City», NF «Postal\_Code»

Dear «Contact\_Name»:

### **Survey of the Financing Experiences of Firms in Newfoundland and Labrador**

Many entrepreneurs face problems in obtaining adequate financing for their firms. The enclosed questionnaire, which will take approximately twenty minutes to complete, is designed to record your own experiences with financing your firm. It will provide valuable information to further our understanding of how firms are financed. It also will enable government departments and lending agencies to target their assistance more effectively to firms with special finance needs.

The survey is part of a larger research project on Lending to the Knowledge-Based Sector in the Province and is part of my doctoral studies. Financial support for this research is being provided by the Centre for International Business Studies and the Canada/Newfoundland Agreement on Economic Renewal. In addition, the Department of Development and Rural Renewal and the Department of Industry, Trade and Technology are providing collaborative support.

### **Special Instructions**

The questionnaire should be completed by the principal owner of the business or alternatively, by the senior financial manager. If you own or operate more than one business, please respond on the basis of the company to which this survey is addressed. Please return the questionnaire in the postage paid envelope provided.

### **Confidentiality**

Information provided by you will be held in strictest confidence. Data will be combined and reported for all respondents such that individual responses cannot be identified. The survey is coded to permit tracking and follow up.

If you have any questions please contact me by phone (collect) at 709-737-3311 or by e-mail at [ggorman@morgan.ucs.mun.ca](mailto:ggorman@morgan.ucs.mun.ca).

Thank you for your assistance.

Sincerely,

Gary Gorman  
Associate Professor

**APPENDIX 4.4**

**FOLLOW-UP LETTERS FOR MAIL SURVEY**

March 10, 1999

«Contact\_Name», «Position»  
«Company»  
«Address\_1»  
«Address\_2»  
«City», NF «Postal\_Code»

Dear «Contact\_Name»:

You may recall recently receiving a **Survey of the Financing Experiences of Small and Medium-Sized Firms in Newfoundland and Labrador**. Your input is essential to understanding the needs of small and medium-sized firms in the Province. As a result, I would like to encourage you to complete and return the survey if you have not done so already.

The survey is part of a larger research project on Lending to the Knowledge-Based Sector in the Province and is part of my doctoral studies. The results of this research, which will be shared with government, will provide valuable information to support the establishment and growth of the small firm sector in the Province. A summary of the results of this survey is also available to participants.

If you have already returned the survey, I would like to thank you again for your assistance. If you require another copy of the survey or if you have any questions about my research, please contact me by phone (collect) at 709-737-3311 or by e-mail at [ggorman@morgan.ucs.mun.ca](mailto:ggorman@morgan.ucs.mun.ca).

I urge you to participate in this study and I look forward to receiving your completed survey in the near future.

Thank you for your assistance.

Sincerely,

Gary Gorman  
Associate Professor

April 2, 1999

«Contact\_Name», «Position»  
«Company»  
«Address\_1»  
«Address\_2»  
«City», NF «Postal\_Code»

Dear «Contact\_Name»:

I would like to extend another invitation to you to participate in the research project on the **Financing Experiences of Small and Medium-Sized Firms in Newfoundland and Labrador**. You may recall receiving the survey in the mail and an earlier letter requesting your participation. You may have felt the survey did not apply to your business because the business is too small. The primary purpose of the research is to learn about your financing experiences. If your business has ever obtained financing from a bank or government agency, I'd like to hear about that experience. The size or nature of the business is not important. In fact, it's essential to hear from a mix of firms.

Your input is important to this project and to understanding the needs of small and medium-sized firms in the Province. As a result, I would like to encourage you to complete and return the survey if you have not done so already. Please be assured that the information will be held in strictest confidence.

If you have already returned the survey, I would like to thank you again for your assistance. If you require another copy of the survey or if you have any questions about my research, please contact me by phone (collect) at 709-737-3311 or by e-mail at [ggorman@morgan.ucs.mun.ca](mailto:ggorman@morgan.ucs.mun.ca).

I urge you to participate in this study and I look forward to receiving your completed survey in the near future.

Thank you for your assistance.

Sincerely,

Gary Gorman  
Associate Professor

**APPENDIX 4.5**

**INTERVIEW PROTOCOL FOR SENIOR BANK  
AND GOVERNMENT OFFICIALS**



## INTERVIEW PROTOCOL FOR SENIOR BANK AND GOVERNMENT OFFICIALS

The primary purpose of the present study is to further our understanding of the debt financing requirements of knowledge-based small and medium-sized enterprises (SMEs) and the processes employed by lending institutions in meeting these needs. To achieve this, it is necessary to determine the financing experiences of knowledge-based SMEs, and to examine the risk assessment approaches utilized by the banks and government agencies when assessing applications for financing from firms in knowledge-based industries.

More specifically, this study is intended to achieve the following research objectives:

- i. to investigate the experiences of entrepreneurs in knowledge-based firms who have sought financing from chartered banks and government agencies;
- ii. to facilitate understanding of the process of lending to knowledge-based businesses in Newfoundland and Labrador;
- iii. to identify and compare the present practices of government departments and agencies with respect to risk assessment of knowledge-based firms;
- iv. to identify and compare the present practices of Canadian chartered banks with respect to risk assessment of knowledge-based firms; and
- v. to compare the lending processes and criteria utilized when lending to high knowledge-intensive firms to those used in lending to less knowledge-intensive businesses.

To achieve these objectives, it is necessary to collect information from three key sources, namely entrepreneurs, senior officials in the chartered banks and government agencies, and account managers in lending institutions. Input from entrepreneurs is required to determine financing experiences and to compare those of high knowledge firms to those in less knowledge-intensive businesses. *Senior banking and government officials provide the context for overall institutional policy and commitment to the SME sector, including knowledge-based firms.* Finally, account managers serve as the primary data source for examining credit decision-making processes and for determining criteria used to evaluate lending applications.

The following questions are directed primarily to senior banking and government officials and deal with aspects of the institutional framework, including strategies, structures, systems, policies and procedures for lending to knowledge-based firms.

1. Does your organization use a definition of knowledge-based business (KBB) or knowledge-based industry (KBI)? If yes, what is it?
2. Does your organization's mandate include a component specifically designed to address the needs of knowledge-based SMEs? (obtain a copy of organization's mission or mandate statement)
3. If yes to #2, how is this aspect of the mandate communicated within and outside the organization? (i.e. bank-wide policies and initiatives, published brochures, pamphlets, and information circulars)
4. Does your organization target specific knowledge-based sectors or KBIs? If yes, which sectors?
5. Does your organization offer products/services targeted specifically to KBBs? If yes, what are these products/services and how do they differ from conventional operating loans, term loans, and government guaranteed loans?
6. Does your organization have specific goals or objectives for the knowledge-based sector? (target for risk exposure, profitability and revenue growth)
7. To what extent are account managers or business development officers and/or others in the organization encouraged to attract KBBs?
8. How is the organization structured to deal with KBBs? (types and configuration of branches and outlets, specialized lending units, management structure, partnerships/collaborations with outside organizations)
9. To what extent do these structures differ from those in place to deal with traditional SMEs?
10. Do you have account managers who specialize in, or focus on, KBBs?
11. What are the recruitment strategies used for account managers who deal with KBBs and how do they differ from those used to recruit traditional account managers? (sources, background of account managers - experience, education, training)
12. Do account managers who deal with KBBs have special training? If yes, please describe the training and how it is provided.
13. To what extent are there differences between the systems, policies and procedures for dealing with KBBs and those for dealing with traditional SMEs? (loan evaluation, decision making)
14. Are account managers who deal with KBBs provided with any additional support? If yes, what type? (internal and/or external)
15. Are there differences in the lending limits of account managers who deal with KBBs and those who deal with more traditional SMEs?

16. Are account managers who deal with KBBs required or encouraged to consult more widely than traditional account managers?
17. How would you describe your organization's experience with KBBs? (risk/return profile, share of business in the region, experience with loan losses, attractiveness of the business)
18. Do you have any other comments or observations?

**APPENDIX 4.6**

**BUSINESS PROPOSALS:  
GLACIER ICE INCORPORATED AND  
TELECARE INCORPORATED**

**GLACIER ICE INCORPORATED**  
**BUSINESS PLAN**

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## **EXECUTIVE SUMMARY**

This business plan demonstrates the feasibility of harvesting and processing glacier ice to produce specialty products, such as ice blocks, cubes and crushed ice for ultimate sale to industrial, institutional and retail consumers. There are a number of distinct qualities that allow glacier ice to be presented as a specialty product. These include the age of the product, its appearance, and the overall purity of the water obtained from glacier ice. The results of a quality analysis of glacier ice samples indicate an extremely high quality product when compared to standard drinking water. To date, a number of firms have capitalized on the harvesting and processing of glacier ice to produce and distribute bottled water and other iceberg-based beverages. However, none are presently producing ice products as proposed by Glacier Ice Incorporated.

The ice processing industry in North America is in a relatively mature stage. Product development and innovation have been slow-paced because of the nature of the product and the stability of customer requirements. However, one new trend in the industry is the production of higher quality ice using filtered water. This correlates to the growth trend in the bottled water industry and consumer demand for high quality, natural water. The production and sale of products processed from glacier ice fit well with these trends.

The business, Glacier Ice Incorporated, has two owners who will act as directors and be involved in the management of the business. The combination of their educational background and their technical, entrepreneurial and management experience provide key ingredients to the company's success. The owners have also made provision for other key management and administrative personnel and for a Board of Directors comprised of individuals with a balance of professional, technical and business acumen.

The owners have completed research on the market potential, customer demand, barriers to entry, competition, and viable distribution options for this initiative. Results of this assessment indicate a venture with significant growth and profit potential. Discussions with a limited number of ice distributors in Florida and Toronto indicate a high level of interest in Glacier's products and confirm the market potential. Sales requirements of distributors in these two locations alone exceed the company's current projected production volume. To date, Glacier has signed orders for 15% of projected first year revenues. Glacier will focus on established ice distributors in these two locations as the initial customer base for glacier ice products. Longer term potential exists for geographic market expansion, for direct distribution to end-use customers under the Company's own brand name, for sale of glacier ice to bottled water companies and for exports to the United Kingdom, Europe and South America.

In order to launch this venture and capitalize on demonstrated market potential and customer acceptance, the owners require term financing at startup of \$200,000, additional term financing of \$100,000 in each of the second and third years of operation, and an operating line of credit of \$1,000,000. Operating credit requirements are significantly reduced in the second and third years.

# I. THE BUSINESS

## Description

Glacier ice is a new specialty product that will be entered into the established ice supply industry in North America. This industry involves the processing and distribution of ice products (blocks, cubes, crushed) and sales to industrial, institutional, and retail markets. Producers in the industry also tend to control the distribution channels for their products.

To a degree, the industry operates on a seasonal cycle where demand fluctuates with temperature and consumer social activities. Regional climates also define geographic markets for the ice supply industry. The southern states of the U.S. provide a year round market for ice products.

The ice processing industry is in a relatively mature stage where most producers have been in operation for many years. Product development and innovation are slow-paced because of the nature of the product and the stability of the customer requirements. Ice companies tend to focus on more efficient production technology in efforts to reduce freezing and packaging costs. One new trend in the industry, however, is the production of higher quality ice using filtered water. This correlates to the growth trend in the bottled water industry and consumer demand for high quality, natural water.

## Product

Glacier ice is formed in northern climates where the winter snowfalls exceed the summer melting. As the snow accumulates over thousands of years, it is compacted by its own weight and forms a very dense sheet of ice. The ice is formed by snow and is therefore freshwater ice. In the formation, air bubbles are trapped in the ice and this accounts for the glistening sparkle and gentle fizz when the ice melts in a drink.

The primary source of glacier ice along the Labrador Coast is Greenland which produces approximately 10,000 icebergs each year from over two dozen glaciers. Greenland's ice sheet measures 1.7 million square kilometers and over the past 10,000 years it has accumulated to a thickness of up to three kilometers.

Ice sheets, which are in perpetual motion towards the sea, move under their own massive weight. At the glacier/ocean interface there are various forces at work that cause huge chunks of the ice to break off and discharge into the sea. These forces include gravity, tides, sunlight, winds and waves.

The southern route traveled by icebergs that originate in Greenland is often indirect. Currents are the primary force driving icebergs due to the seven-eighths of its mass located below water. As a result, icebergs tend to follow the West Greenland current to the top of Baffin Bay and then follow the Arctic Ocean currents southwest until they hit the Labrador Current. It is the Labrador Current that carries the bergs along the coast



of Labrador to their final demise in the warmer Atlantic waters. A journey of two to three years is typical.

There are a number of distinct qualities that allow glacier ice to be presented as a specialty product. These include the age of the product, its sparkling appearance, the fizzing sound as it melts and the overall purity of the water. It is this last feature that represents the greatest potential marketing appeal. The glacier ice was formed when the earth was uncontaminated by pollution and industrial chemicals. Since that time it has been trapped in a purified state. Appendix A provides a quality analysis of glacier ice samples. The results of the test indicate an extremely high quality product when compared to permissible contaminant levels in standard drinking water. A bacterial analysis of the ice also revealed no contaminants.

### Management

An important aspect in the success of this venture is the background and expertise of the owners. It is envisaged that two key positions related to the project, plant manager and general foreman, will be performed by William Brewer and Paul Williams.

Mr. Brewer has an MBA degree from Memorial University of Newfoundland and significant management experience in the fishing industry, having worked as a fish plant manager and as a marketing manager with Fishery Products International. Mr. Williams has had broad experience as an owner/operator and foreman in various industries including long-liner building, highway construction and fur farming. Both have excellent credit ratings and proven histories of debt repayment having borrowed significant amounts in the past for personal and business purposes.

The combination of their educational backgrounds, technical, entrepreneurial and management experience provide key ingredients to the company's success. They have also made provision for other key management, technical and administrative personnel and for a Board of Directors comprised of individuals with a balance of professional and business acumen.

Since the company was formed in May 2000, the shareholders have been working jointly on the development aspects of the venture. Considerable effort has gone into the design and costing of the harvesting and processing operations. A feasible operating plan has now been developed. Company members have also been working on securing processing facilities, identifying any regulatory obstacles, assessing market potential, developing a marketing plan and obtaining initial orders.

## **II. THE MARKET**

### **Potential Customers**

In general terms, the end use customers for ice products include hotels, restaurants, catering services, nightclubs, convenience stores and service stations. These customers purchase their products through a wholesale distribution network. Typically, the distributors are also involved in the production of ice products.

For the purpose of the market assessment, this business plan focuses on established ice distributors as the initial customer base for glacier ice. Market research identified the following potential North American distributors/customers:

- Crystal Ice Company, Scarborough, Ontario
- Lake Simcoe Ice, Islington, Ontario
- Kanemotsu – Goshu Canada Inc., Mississauga, Ontario
- Ice Enterprises, Orlando, Florida
- Aardvark Ice and Beverages, Orlando, Florida
- Reddy Ice/Sparkle Ice, Davis, Florida
- Royal Palm City Ice, Hollywood, Florida
- Apolo Ice Company, Miami, Florida
- Independent Ice, Tampa, Florida
- Century Ice, Clearwater, Florida
- Ancient Ice & Beverage Company, Des Plaines, Illinois
- Consiglio Communications Ltd., Montreal, Quebec

Discussions with a number of ice producers/distributors in Toronto and Florida indicate a high level of interest in glacier ice and demonstrate its market potential. These distributors have established access to hotels, restaurants, nightclubs, convenience stores, service stations, grocery store chains and theme parks. Sales requirements of distributors in these two locations alone exceed the company's current projected production volume. To date, Glacier has confirmed orders from distributors for 15% of first-year projected sales.

### **Market Size and Potential**

The size of the commercial and retail ice market in North America is extremely large, as supported by the sales figures obtained for some of the companies noted above. Although a specific figure for the size of the market could not be obtained, the total for five of the companies gives a good basis for approximation (see Table 1).

Finally, the major barriers affecting "me too" operations and entry into this industry are access to physical and financial resources. As a result, the most significant potential competitor for Glacier Ice is Iceberg Industries which markets a number of iceberg-based products including water, vodka and beer. However, Iceberg Industries does not presently market ice products. Indeed, there may be some potential to sell raw material to Iceberg Industries. With the uncertainty of the market, it is not possible to gauge how many companies can operate successfully in the harvesting and distribution of ice products, particularly cubes, blocks and crushed ice. However, first-mover advantage should provide Glacier with the opportunity to enter and dominate the market before any other competitors enter.

### Estimated Market Share and Sales

The estimates prepared on the ice supply market in North America are useful in demonstrating the potential for this project. Also, the assumption that glacier ice will acquire market share from commercially produced ice is logical. The problem is that estimating market share is not feasible without a detailed market plan and test market results. For the sales estimates to be used in the balance of this proposal, it is more realistic to look at specific production levels and assume that sales agreements can be obtained for the company's output. Preliminary discussions with distributors support this assumption.

As a starting point, the owners have identified a first year production level of 2.5 million pounds. This output can be doubled in the second year with the addition of a second shift in the plant. Expansion of processing facilities and the hiring of additional staff could easily double production again in the third year. Based on these assumptions the production/sales schedule for the first three years of operation is as follows:

	2001	2002	2003
Sales/Production (lbs.)	2,500,000	5,000,000	10,000,000

### Future Market Potential and Growth Opportunities

Initial efforts carried out for this project have been directed primarily at assessing the market potential for the sale of glacier ice products to North American ice distributors, especially those located in Toronto and Florida. In terms of future growth, there are no obvious impediments from the production side. There is an unlimited supply of raw product and sufficient labour resources in the region for harvesting and processing expansion. Future marketing plans include a detailed market assessment in the following additional areas:

1. Development of regional markets for glacier ice.
2. Direct distribution to end-use customers under the Company's own brand name.
3. Sales of glacier ice to bottled water companies.
4. Exports to the United Kingdom, Europe and South America.

### **III. MARKETING STRATEGY**

#### **Target Market**

The initial marketing strategy being pursued by the company is to secure distribution agreements for the first three year's production with established ice distributors. This approach will allow the owners time to establish the physical operation and develop expertise in the harvesting and processing of glacier ice. As an entry strategy, the company will offer chipped and block ice to one or two major distributors serving specific regions. In the second year, the company plans to increase production with the addition of a second shift. It is also planned to offer ice cubes through the installation of specialized cutting equipment.

Direct sales and marketing of the glacier ice products to end users will be under the control of the companies awarded distribution rights. Sales commitments for the company's production will also provide financial stability for the project and strengthen investor confidence. This is an important factor in light of anticipated operating costs and the need to secure an operating line of credit.

#### **Promotion**

In promoting glacier ice the company will focus on two areas. The first will be to develop a specific image that captures and highlights the quality of the product. This will be accomplished through a distinctive name, colourful packaging and promotional literature. The objective is to have glacier ice promoted as a repeat purchase product and not just as a novelty. This will require an emphasis on the quality and purity of the product.

The second aspect to be emphasized in the promotion is to heighten awareness of the product and company. This will be accomplished through media publicity, attendance at trade shows, supplying samples and information to potential distributors and the utilization of trade commission services in foreign markets.

A targeted advertising campaign focusing on potential end-users will support direct-marketing efforts to distributors. This campaign will include the use of television, magazine and radio. Targeted programs, timeslots, and publications will ensure effective reach to the various target groups. Glacier has enlisted the services of a major advertising agency to assist in this regard.

Based on discussions, it is anticipated that the distributors of glacier ice will support the regional and local promotion of the product. This would include local advertising, introductory specials, and a communication program to educate their customers on the product's qualities. Where possible the company will utilize resources and financial support of both levels of government to for the promotional requirements of this project.

## Distribution

The major sales effort for this project will be during the negotiation of initial distribution agreements. It is vital that the company establish a solid distribution base. In evaluating potential distributors and negotiating a distribution contract it is important that the following points be considered:

- Distributors must have the resources to effectively promote glacier ice.
- The volume of purchases by distributors must be large enough to minimize freight costs and also motivate promotion of the product.
- The distributor's client network should be broad so that glacier ice can be evaluated in different market segments.
- The growth potential of each distributor must be assessed.
- Terms of agreement should allow for price reviews on the basis of production costs and market conditions.
- Geographic areas of distribution should be specified for each distributor.
- A termination clause should be included to deal with the situation of a distributor not fulfilling its obligations.
- Shipping arrangements must be clearly specified for each distributor.

## Pricing

A tentative price of \$0.70/lb. has been assigned to the first year production and sales of glacier ice. This price is F.O.B. the processing facilities in Plum Point and is considered to be competitive by a sample of distributors surveyed. During negotiations for distribution agreements, however, this price will have to be reassessed based on the actual ice product (i.e. chips, block) sold and the associated production costs. Renegotiations and adjustments of prices in future years will be required to compensate for production costs and new competitors.

## **Harvesting and Processing Operations**

The first stage in the overall operation is the harvesting of iceberg bits from coastal waters and stockpiling in an impound area close to the plant. This process will be accomplished through a charter arrangement with local fisherpersons. Two charter boats will operate over a ten-week period to collect bits, growlers and small bergs and transport the product to a holding area. A holding boom will ensure that the iceberg bits remain in the designated area until the product is transported to the plant at Plum Point. Sufficient product will be stockpiled during this period to meet the season's production quota. Expansion of production capacity in future years will necessitate an increase in the number of charter vessels supplying glacier ice fragments.

The next step in the harvesting process will involve the transport of the iceberg bits from the holding area to the plant, a distance of approximately 10 kilometers. Two barges, which will be purchased in the United States and customized locally, will relay the glacier ice to the plant (see Appendix B). The barges will be capable of either carrying or towing the ice. Local crews will be hired to operate these vessels.

As the glacier ice chunks are delivered to the wharf at the processing site it is necessary to remove them from the water. This step will be accomplished through the use of a floating slipway and powered winch assembly. The ice will be pulled up to the slipway onto the dock (see Appendix C).

The ice chunks will then be cut into blocks measuring 2 ft. x 2 ft. x 2 ft. and weighing approximately 500 lbs. Workers will cut these blocks manually with powered ice saws. Each block will then be lifted by a forklift onto a holding table in the plant. The blocks will then be put through a cleaning process using a high-pressure steam cleaner. After cleaning, the blocks will be fed by conveyor into a rotary crusher that will create ice chips in a size range of ½ to 2 inches. These ice chips will then be packaged in 20 lb. capacity plastic-lined boxes and transported by conveyor and forklift to the cold storage area in the plant. Monitoring for quality control and proper package weight will be an integral part of the process.

The plant arrangement will be a dual line with two conveyors and two crushers. This allows for equipment downtime and scheduled maintenance requirements. The crushing equipment will be selected on the basis of future production requirements. Based on Year 3 production forecast of 10 million pounds and an operating season of 2,400 hours (6 days x 20 weeks x 20 hours), the units will have a throughput of 2 tons/hour.

## **Production Plan**

The basic strategy being followed by the company is to begin operations in the spring of 2001 and setup the plant to provide both ice chips and ice blocks. Processing facilities will be sized to handle the production volume of 10 million lbs. per year through one crusher assembly. The peak capacity for the plant will be twice this volume when operating both processing lines. Increases in output can be handled easily through the hiring of additional crews and the establishment of a second shift.

The simplicity of the production facilities allows easy expansion should future sales warrant.

The development of a cubed product (1½"x1½"x1½") will be under evaluation during the first two years. The equipment design to produce this product is complete but the market requirements must first be assessed. If there is a demand for glacier ice cubes, the specialized cutting equipment will be fabricated and installed in either the second or third operating season.

The following is a list of production assumptions underlying the venture's first three years of operation:

- Production season            20 weeks (late May to early October)
- Operating days                120 days
- Harvest volumes (lbs.)      10 million Year 1  
    20 million Year 2  
    40 million Year 3
- Final yield                      25%
- Production Output (lbs.)    2.5 million Year 1  
    5 million Year 2  
    10 million Year 3
- Ice chips                        ½" – 2"  
    20 lbs./bag
- Ice blocks                       2 ft. x 2ft. x 2ft.  
    500 lbs./block

### Regulatory Issues

The company is not confronted with any major regulatory concerns in the production or distribution of their product. Compliance with FDA regulation for exports into the United States does not appear to be a problem. The International Trade Centre of Industry Canada in St. John's has confirmed through conversations with Canadian Consulate officials in the US and with Ottawa-based trade officials of the Department of Foreign Affairs and International Trade that the only requirement will be for Glacier Ice to prove that there are no contaminants in the ice. The quality analysis attests to this fact.

## V. FINANCIAL PLAN

A financial review of the venture was completed on the basis of the sales projections, production volumes, cost estimates, and pricing information identified in this report. The emphasis is on demonstrating the financial viability of the business through a profit and loss evaluation over the first three years. A cash flow analysis has also been completed to show the necessary operating financing and time to reach positive cash flow. The detailed financial statements are presented in Appendix D.

### Profit and Loss Analysis

The results from the preparation of the pro forma profit and loss statements for the venture indicate that the company can be profitable under the given assumptions. A profit of approximately \$10,000 is projected for the first year of the venture. In years 2 and 3, the company's profitability increases significantly resulting in after tax profits of \$429,764 and \$1,809,716 respectively.

It should be noted the assumptions for interest expense and taxes are based on a full cost scenario. The project may be eligible for financial assistance that could reduce the borrowing requirements and therefore reduce interest costs. Also, there may be additional tax concessions that could reduce the tax liability.

Any variation in either the sales price or sales volume will have a direct impact on the profitability of the venture. There is the potential to reduce production volume if sales are not obtained but it should be realized that some of the costs are fixed and because of the short season it may be necessary to stockpile product.

### Cash Flow Analysis

The project's cash flow was evaluated for the first year of operation. It was assumed that the project would start in April and capital funding of \$200,000 would be approved. The harvesting and processing operation would begin in June and terminate in October. The first sales would occur in August and are assigned evenly to each month thereafter. Based on 30-day credit terms, it was assumed receivables would come in over the period September through December. Overhead expenses were prorated for the first year and assigned evenly to each of the months.

Based on these parameters, the cash flow analysis is presented in Appendix D. The project will have a short-term cash requirement of approximately \$1,000,000 to cover the first year of operation. If the sales for the product are achieved and receivables collected, then a positive cash flow should be realized by the end of the year. The critical assumption in this analysis, however, is that product sales and collections of receivables will be achieved. Any collection delays or sales shortfalls will greatly increase the operating credit requirements for the first year.



## Financing Considerations

The owners of Glacier Ice have indicated they are in a position to contribute \$100,000 equity to the venture. Based on the capital cost estimates and proposed operating scenario for the company it would appear the company will require additional financial support as follows:

Term Loans:	\$200,000 at startup and \$100,000 in each of years 2 & 3.
Operating Loan:	\$1,000,000 in year 1 and an average requirement of \$200,000 for the first three months of years 2 and 3.

This level of financing is the minimum required to initiate and to support the venture's first three years of operations.

## VI. CRITICAL RISKS AND ASSUMPTIONS

Inherent in the nature and status of this project are some basic risks that should be specified for both the owners and potential investors. The main areas of concern are as follows:

- **Schedule** – Glacier ice has a specific season where it can be harvested along the Labrador coast. If the venture is to be initiated in 2001, then the necessary funds must be secured to allow setup of the processing facilities and harvesting of this season's ice.
- **Location** – The area of operation is dictated by climatic conditions such as the annual ice pack. This can delay startup of annual operations and result in transportation problems. Also, the remoteness of the operation requires planning and contingency arrangements for equipment failure.
- **Processing** – The ice processing system is not complex but will still have startup problems that could delay production in the short term.
- **Product** – Glacier ice is a perishable product which requires freezer containers for shipment. The distance from major markets results in a high degree of dependence on the carriers.
- **Competitors** – It is inevitable that other companies will follow the lead of Glacier Ice. Consequently, there could be price-cutting as competitors try to establish sales.
- **Sales** – To date, the company has obtained sales commitments for 15% of first-year projected revenues. Therefore, the decision to begin operations has been reached largely on the basis of market potential.
- **Cash Flow** – The success of the venture depends on sales and cash flow. To produce glacier ice requires a large outlay of operating funds in the short term and delays in cash receipts will result in requirements for additional operating credit.

**APPENDIX A**  
**LABORATORY ANALYSIS OF GLACIER ICE**

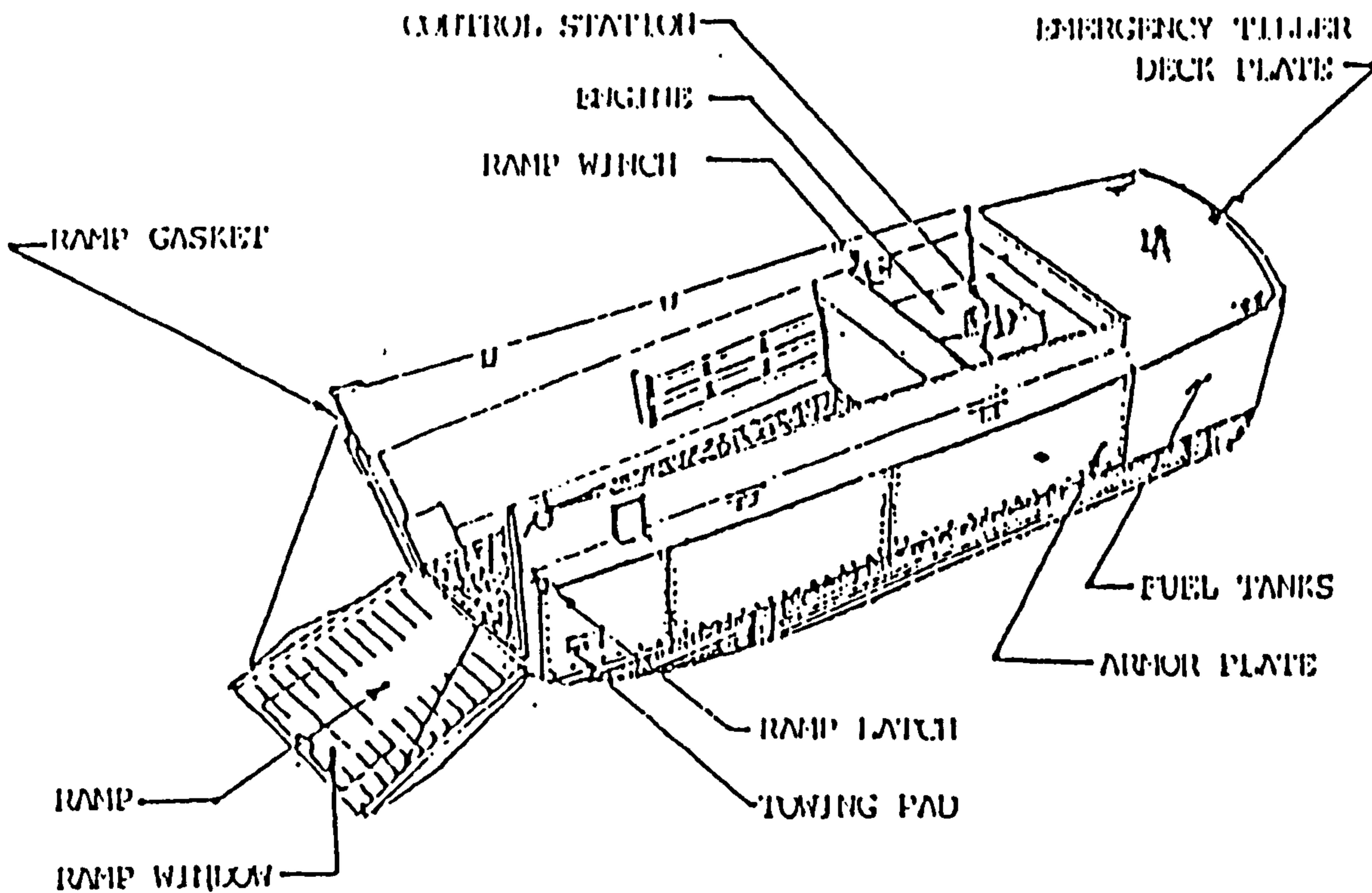
**COMPARISON OF GLACIER ICE ANALYSIS WITH ALLOWABLE  
POTABLE WATER STANDARDS AND LOCAL DRINKING WATER**

<u>Parameter</u>	<u>Units</u>	<u>Glacier Ice</u>	<u>Regular Tap Water</u>	<u>Allowable Standards</u>
Hardness	mg/L Ca CO <sub>3</sub>	3.2	10-20	100
pH	Units	4.59	6-7	5.5-8.5
Calcium	ms/L Ca	0.41	5	N/A
Magnesium	mg/L Mg	0.54	1-2	N/A
Manganese	mg/L Mn	<0.005	0.01	0.05
Iron	mg/L Fe	0.01	0.05	0.30
Copper	mg/L Cu	<0.005	0.02	1.0
Zinc	mg/L Zn	<0.005	0.02	5.0
Cadmium	mg/L Cd	<0.0005	<0.0005	0.005
Lead	mg/L Pb	0.01	0.01	0.05
Chloride	mg/L Cl	8.9	10-20	250

**APPENDIX B**  
**DETAILS ON ICE TRANSPORT VEHICLES**

QUALITY BOATS COMPAY, INC.

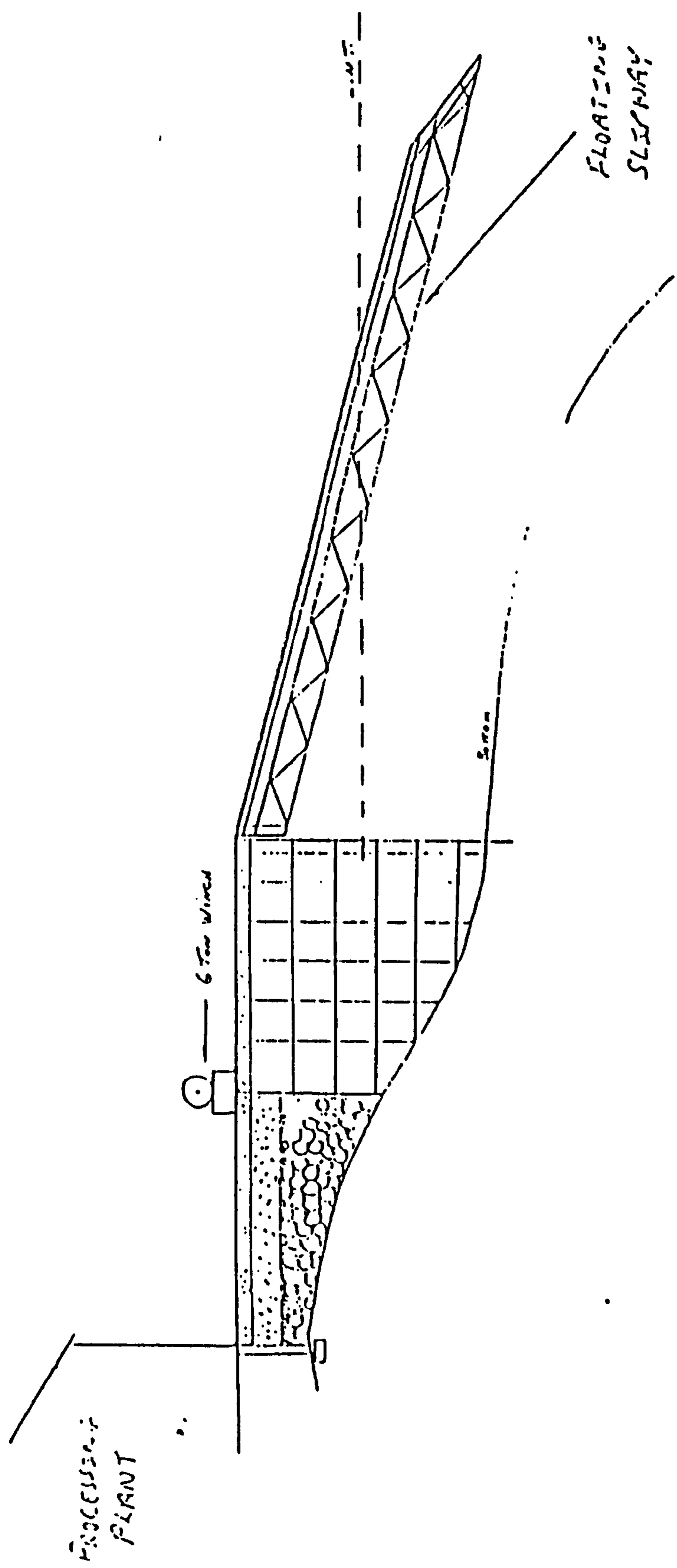
36 FOOT LANDING CRAFT FOR VEHICLE OR PERSONNEL (LCVP)



The LCVP is a vee-bottom landing craft constructed of glass-reinforced plastic, and suitable for carrying vehicles, personnel, or cargo. It is powered by a diesel engine burning a single screw in a recessed tunnel. This craft was designed for transporting cargo, troops, or a vehicle from ship-to-shore, or shore-to-shore during amphibious operations. They are suitable for lighterage and other utility work in harbours and have been utilized as passenger ferries, push boats, diving-salvage boats and for river minesweeping.

**APPENDIX C**  
**DIAGRAM OF FLOATING SLIPWAY**

DIAGRAM OF FLOATING SLIPWAY



PROCESSING PLANT, GOVT WHARF, FLOATING SLIPWAY



**APPENDIX D**  
**FINANCIAL PROJECTIONS**

**Glacier Ice  
Sales Forecast**

	2001	2002	2003
<b>Estimated Production (lbs.)</b>	2,500,000	5,000,000	10,000,000
<b>Price per lb.</b>	0.70	0.75	0.80
<b>Total Revenue</b>	\$ 1,750,000.00	\$ 3,750,000.00	\$ 8,000,000.00

**Assumptions:**

1. Sales in the first year are spread evenly over the period August – November

**Glacier Ice  
Income Statement for Three Years**

	Year 1		Year 2		Year 3
<b>Revenue</b>					
Ice Sales	\$ 1,750,000	(1)	\$ 3,750,000		\$ 8,000,000
<b>Less Cost of Goods Sold</b>					
Harvesting Costs	\$ 340,800	(2)	\$ 535,560		\$ 803,784
Processing Costs	\$ 700,660	(3)	\$ 1,451,130		\$ 2,456,553
<b>COST OF GOODS SOLD</b>	\$ 1,041,460		\$ 1,986,690		\$ 3,260,337
<b>GROSS MARGIN</b>	\$ 708,540	(4)	\$ 1,763,310		\$ 4,739,663
<b>Expenses</b>					
Owners' salaries	\$ 130,000	(5)	\$ 143,000		\$ 157,300
Management and staff salaries	\$ 100,000	(6)	\$ 200,000		\$ 300,000
Rent	\$ 50,000	(7)	\$ 55,000		\$ 60,000
Utilities	\$ 35,000	(8)	\$ 70,000		\$ 120,000
Professional fees	\$ 10,000	(9)	\$ 15,000		\$ 25,000
Taxes & licences	\$ 10,000	(10)	\$ 11,000		\$ 12,000
Insurance	\$ 20,000	(11)	\$ 22,000		\$ 24,000
Interest on term loan	\$ 21,120	(12)	\$ 27,840		\$ 32,640
Interest on operating line of credit	\$ 61,161	(13)	\$ 7,500		\$ 7,500
Advertising and sales	\$ 125,000	(14)	\$ 200,000		\$ 275,000
Depreciation on capital equipment	\$ 40,000	(15)	\$ 60,000		\$ 80,000
Telephone & equipment	\$ 10,000	(16)	\$ 15,000		\$ 20,000
Vehicle lease, maint. & operating	\$ 10,000	(17)	\$ 20,000		\$ 30,000
General office expenses	\$ 5,000	(18)	\$ 5,500		\$ 6,000
Micellaneous	\$ 60,000	(19)	\$ 85,000		\$ 110,000
<b>Total Expenses</b>	\$ 687,281		\$ 936,840		\$ 1,259,440
<b>Net Income Before Tax</b>	\$ 21,259	(20)	\$ 826,470		\$ 3,480,223
Tax Expense	\$ 10,204		\$ 396,706		\$ 1,670,507
<b>Net Income After Tax</b>	\$ 11,055	(21)	\$ 429,764		\$ 1,809,716

## Notes to Income Statement

- Note 1:** 2,500,000 lbs. x \$0.70/lb.  
Refer to Sales Forecast
- Note 2:** Refer to attached Harvesting Cost Schedule
- Note 3:** Refer to attached Processing Cost Schedule
- Note 4:** \$1,750,000 - \$1,041,460 = \$708,540
- Note 5:** The owners' salaries are \$65,000/person in the first year. The salaries increase by 10% in the second and the third year.
- Note 6:** In addition to the two owners, Glacier Ice will employ 2 full-time administrative people (management & staff) in the first year. This does not include the 26 people employed in the processing side of the operation. Employee wages have been increased in years 2 and 3 in proportion to the increase in sales since expansion will require additional personnel. This figure also includes provision for hiring, training and skill maintenance fees.
- Note 7:** Rental fees for plant and office space have been increased in years two and three by 10% in accordance with the agreement with the Department of Fisheries and Oceans.
- Note 8:** Utilities have been increased in years 2 and 3 to reflect the increase in production.
- Note 9:** Allocation for auditing and legal fees increased to reflect increases in the level of activity in years 2 and 3.
- Note 10:** Allocation for property taxes as per agreement with DFO.
- Note 11:** Allocation for property insurance as per agreement with DFO.
- Note 12:** See attached interest calculation for term loan.
- Note 13:** See attached interest calculation for operating loan requirements.
- Note 14:** Expenses relate primarily to the advertising campaign and are lower than otherwise as a result of promotional support provided by distributors.
- Note 15:** See attached depreciation schedule for capital equipment.
- Note 16:** Fees include telephone and telecommunication equipment and associated usage costs. Increases in the second and third years reflect increases in the level of sales activity.

**Note 17:** Vehicle expenses have been increased in years 2 and 3 in proportion to the increase in sales activity.

**Note 18:** These expenses are projected to increase at 10% a year.

**Note 19:** 10% additional allocation.

**Note 20:** Net Income = Gross Margin - Expenses

**Note 21:** The income tax rate is 48%.

**Assumptions:**

**Assumption 1:** No dividends will be paid for the first three years.

**Assumption 2:** All dollars are in Canadian funds.

## Harvesting Cost Schedule

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Charter boats to supply ice (10 weeks x 6 days/week)	\$ 96,000	\$150,000	\$264,000
Transport ice to plant by barge	<u>\$244,800</u>	<u>\$385,560</u>	<u>\$539,784</u>
<b>Total</b>	<b>\$340,800</b>	<b>\$535,560</b>	<b>\$803,784</b>

**Notes:**

1. Charter boats at 60 tons/day (2 small growlers of 30 tons each)  
 Year 1 – 500 tons/week/6 days = 83 tons/day; 2 boats required  
 Year 2 – 1,000 tons/week/6 days = 166 tons/day; 3 boats required  
 Year 3 – 2,000 tons/week/6 days = 333 tons/day; 5 boats required
  
2. Rates per day: \$800 year 1; \$840 year 2; \$880 year 3
  
3. Operating costs for barges:
 

Captain - \$25/hr. x 10 hrs. =	\$ 250/day
Crew – 2 at \$15/hr. x 10 hrs. =	\$ 300/day
Fuel – 8 gal./hr. x 10 hrs. x \$4/gal. =	\$ 320/day
Maintenance - \$15/hr. x 10 hrs./day =	<u>\$ 150/day</u>
<b>Total</b>	<b>\$1,020/day</b>
  
4. Barges – 2 in year 1, 3 in year 2, 4 in year 3
  
5. Cost escalation of 5% applied in years 2 and 3

## Processing Cost Schedule

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Direct Labour	\$561,600	\$1,179,360	\$1,995,840
Equipment Operation	59,760	105,240	111,000
Packaging	<u>79,300</u>	<u>166,530</u>	<u>349,713</u>
Total	\$700,660	\$1,451,130	\$2,456,553

Notes:

1. Operation = 20 weeks x 6 days week = 120 days/year
2. Basic Shift is 12 hours at \$15/hour = \$180/shift
3. Year 1 require only 1 day shift to produce 2.5 million lbs.
4. Year 2 require 2 shifts/day to produce 5.0 million lbs.
5. Year 3 require doubling of crew on 2 shift basis to produce 10 million lbs.
6. Equipment operation is for 2 forklifts – cost as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Lease	\$ 70/day	\$ 75/day	\$ 80/day
Proposal	\$ 15/day	\$ 31.50/day	\$ 33/day
Maintenance	\$ 20/day	\$ 30/day	\$ 31.50/day
Operation	<u>\$144/day</u>	<u>\$302/day</u>	<u>\$318/day</u>
Total	\$249/day	\$438.40/day	\$462.50/day

7. Packaging for the product is cost as follows:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Plastic liner (20 lbs. capacity)	\$ 7,800	\$ 16,380	\$ 34,398
Boxes (20 lbs. capacity)	\$71,500	\$150,150	\$315,315

Quantity required is 130,000 (year 1), 260,000 (year 2), 520,000 (year 3)  
 Unit cost is \$0.06 for plastic and \$0.55 box, 5% increase in years 2 and 3

8. Direct labour costs are based on the following:

**Year 1**

4 persons on winch =	\$ 720
4 persons cutting cubes =	\$ 720
2 persons on feed table =	\$ 360
2 persons on wash =	\$ 360
6 persons on crusher line =	\$1,080
6 persons on packaging =	\$1,080
2 persons in storage =	<u>360</u>
Total Shift	\$4,680

**Year 2**

Second shift added at 5% increase = \$9,828

**Year 3**

Additional workers added, rate = \$15.75/hr.

8 persons on winch =	\$1,512
8 persons cutting cubes =	\$1,512
4 persons on feed table =	\$ 756
4 persons on wash =	\$ 756
8 persons on crusher line =	\$1,512
8 persons on packaging =	\$1,512
4 persons in storage =	<u>756</u>
Total Shift	\$8,316
Total day	\$16,632



## Interest Expense Schedule

### 1. Term Loans

**Assumptions:** 5 year loans @ 15%  
Interest expense = 33% in year 1, 27% in year 2 and 21% in year 3

**Loan 1** \$200,000 @ 15% = monthly payment of \$4,400  
Total payment = \$264,000; interest = \$64,000

Year 1:  $0.33 \times 64,000 = \$21,120$   
Year 2:  $0.27 \times 64,000 = \$17,280$   
Year 3:  $0.21 \times 64,000 = \$13,440$

**Loan 2** \$100,000 @15% for 5 years = monthly payment of \$2,200  
Total payment = \$132,000; Interest = \$32,000  
Year 2:  $0.33 \times \$32,000 = \$10,560$   
Year 3:  $0.27 \times \$32,000 = \$ 8,640$

**Loan 3** \$100,000 @15% for 5 years = monthly payment of \$2,200  
Total payment = \$132,000; Interest = \$32,000  
Year 3:  $0.33 \times \$32,000 = \$10,560$

Term loan interest:	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Loan 1:	\$21,120	\$17,280	\$13,440
Loan 2:		\$10,560	\$8,640
Loan 3:			<u>\$10,560</u>
<b>Total term loan interest</b>	<u>\$21,120</u>	<u>\$27,840</u>	<u>\$32,640</u>

### 2. Operating Line of Credit

**Assumptions:** Based on cash flow projections the operating credit requirements vary between \$100,000 and \$1,000,000

Interest on the operating line of credit is based on the average closing balance requirements over the 7 months  
6 months

15% interest rate

**Calculation of Operating Line of Credit:** \$4,892,888/11 months = \$444,808

**Interest in Year 1:**  $\$444,808 \times 15\% \times 11/12 = \$61,161$

**Interest in years 2 & 3:** Assumes operating credit requirements for the first 3 months of each year:  
( $\$200,000 \times .15 \times .25 = \$7,500$ )

### Depreciation Schedule

The estimate for depreciation is based on the straight line method for capital expenditures.

Year 1:  $\$200,000/5 \text{ years} = \$40,000/\text{year}$

Year 2:  $\$100,000/5 \text{ years} = \$20,000/\text{year}$

Year 3:  $\$100,000/5 \text{ years} = \$20,000/\text{year}$

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Depreciation expense	\$40,000	\$60,000	\$80,000

<b>Glacier Ice</b>											
<b>Projected Statement of Cash Flows</b>											
<b>For the Period April 1, 2001 - December 31, 2001</b>											
	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>		
<b>Cash Inflows</b>											
Term Loan	200,000					350,000	350,000	350,000	350,000	350,000	350,000
Accounts Receivable											
<u>Total Receipts</u>	200,000	-	-	-	-	350,000	350,000	350,000	350,000	350,000	350,000
<b>Cash Outflows</b>											
Capital Expenditures	100,000	100,000									
Term Loan Principal Payment		3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333
Term Loan Interest		1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Overhead Expenses	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Harvesting Costs		85,200	85,200	85,200	68,160	51,120	51,120	51,120	51,120	51,120	51,120
Processing Costs		140,132	140,132	140,132	140,132	140,132	140,132	140,132	140,132	140,132	140,132
<u>Total Disbursements</u>	175,000	180,093	305,425	305,425	288,385	271,345	271,345	271,345	271,345	80,093	80,093
<b>Cash Increase/Decrease</b>	25,000	- 180,093	- 305,425	- 305,425	- 288,385	78,655	78,655	269,907	269,907	269,907	269,907
Opening Balance	50,000	75,000	- 105,093	- 410,518	- 715,943	- 1,004,328	- 925,673	- 847,018	- 577,111	- 577,111	- 577,111
Closing Balance	75,000	- 105,093	- 410,518	- 715,943	- 1,004,328	- 925,673	- 847,018	- 577,111	- 307,204	- 307,204	- 307,204

**Assumptions:**

1. The project will start in April with the harvesting and processing operations beginning in June and ending in October
2. Sales were assigned evenly to each month with receivables coming in over the period September - December based on 30 day credit terms.
3. Overhead expenses were prorated for the first year and assigned evenly to each of the months.

**Calculations:**

Term loan payment: \$200,000/60 months  
 Term loan interest \$21,120/12 months

## Glacier Ice Balance Sheets

Opening Balance  
Sheet                      31-Dec-01

<b>Current Assets</b>		
Cash	\$ 100,000	
Accounts Receivable		\$ 350,000
Inventory	\$ -	\$ 191,250
<b>Total Current Assets</b>	<b>\$ 100,000</b>	<b>\$ 541,250</b>
<b>Total Fixed Assets</b>		
Capital Equipment (net after reserve for depn.)	\$ -	\$ 160,000
<b>Total Assets</b>	<b>\$ 100,000</b>	<b>\$ 701,250</b>
<b>Liabilities</b>		
Term Loan	\$ -	\$ 163,337
Tax Payable	\$ -	\$ 10,204
Operating Loan	\$ -	\$ 307,204
Accounts/Accrued Payables	\$ -	\$ 109,450
<b>Total Liabilities</b>		<b>\$ 590,195</b>
<b>Equity</b>		
Owners' Equity	\$ 100,000	\$ 100,000
Retained Earnings	\$ -	\$ 11,055
<b>Total Liabilities and Owners' Equity</b>	<b>\$ 100,000</b>	<b>\$ 701,250</b>

**TELECARE INCORPORATED**  
**BUSINESS PLAN**

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## EXECUTIVE SUMMARY

This business plan demonstrates the feasibility of offering a private sector telemedicine-based initiative — medical diagnosis, consultation, and monitoring of patients with cardiovascular disease at a distance. Telemedicine is telecommunication that enables the connection of a patient and a health care provider through live two-way audio and two-way video transmission, and permits effective diagnosis, treatment and other health care activities. As with other medical-based services, there are a number of barriers and restrictions that must be investigated and understood prior to entering the market. This venture plan identifies the critical entry barriers and demonstrates how TeleCare can minimize their impact and establish a profitable venture with significant short and long-term growth potential.

The business, TeleCare Incorporated, has two owners who will act as directors, be involved in the management of the business, and provide key professional services. The experience and education they bring to the venture, as well as the knowledge and expertise of the management and staff they plan to hire, are key factors in determining the profitability and sustainability of the company. The owners have also made provision for a Board of Directors comprised of individuals with a balance of professional, technical, and business acumen.

As this is a service-oriented venture the way in which TeleCare differentiates itself from existing services, the service image, the expertise of the staff, and the knowledge and experience of the management group will be the determining success factors. Market potential, customer demand, barriers to entry, competition, and viable distribution options have been evaluated for this initiative. Results of this assessment indicate a venture with significant growth and profit potential. Discussions with a number of health management organizations, physicians, and major employers in Florida indicate a high level of interest in TeleCare's service package and confirm the market potential. To date, TeleCare has signed orders for 15% of projected first year revenues.

TeleCare has selected a target group on the basis on geographic location and medical illness. This report identifies considerable potential in the United States. In the short-term one state, Florida, will be targeted, as it presents the greatest opportunity due to their high population density, low level of competition and established Health Management Organization structure. In addition, data support a telemedicine initiative targeting those with cardiovascular disease in the short term. Longer term potential exists for geographic market expansion, for expansion into customer segments based on additional forms of illness, and for the introduction of additional telemedicine-based services.

In order to launch this venture and capitalize on demonstrated market potential and customer acceptance, the owners require term financing at startup of \$200,000, additional term financing of \$100,000 in each of the second and third years of operation, and an operating line of credit of \$1,225,000 in the first year. Operating credit requirements are significantly reduced in the second year.

# I. THE BUSINESS

## Description

The traditional definition of telemedicine is defined as medical practice across distances via telecommunications and interactive video technology. Telemedicine enables the connection of patients with health care providers as well as the transfer of knowledge. The traditional form of telemedicine service consists of the interaction between health care professional and a patient who is located in a remote area. The patient is able to go to a local clinic and take advantage of expertise from a medical professional through telephone and computer technology. This expertise would not have been available to the client in this remote area except for this service.

TeleCare will take traditional telemedicine one step further. TeleCare will offer its clients medical diagnosis, consultation, and monitoring without leaving their own homes. This business will be defined by a number of characteristics:

1. Elimination of restrictions based on distance.
2. Preventative medicine.
3. Immediate medical attention.
4. Ease through which patients are connected to health-care providers.
5. Access to medical knowledge and information.

Even though this is not a traditional medical practice the same barriers to entry exist. The three major barriers include:

1. Licensure issues (licensing and malpractice issues are of primary concern),
2. Confidentiality of patient records, and
3. Various liability issues.

This plan addresses these issues and other barriers that TeleCare must overcome in order to successfully establish this service.

## The Service

Studies show that many people who experience heart attacks wait too long before seeking help. Recognizable signs are evident in the two-hour period prior to a heart attack and 95% of deaths could be avoided if people went to a hospital during this period. Unfortunately, most people discount the warning signals. The proposed service will eliminate this risk. For those individuals who have a history of heart problems, this service will ease their minds to know that if there are warnings signs they can quickly and conveniently confirm whether or not there is a problem. If there isn't a problem then the client is saved the inconvenience of going to an emergency room. If there is a problem then quick attention increases their chances of survival.

This is a service that can be used anytime the client wishes. Clients can monitor their heart at home, in the office or even in the car. This is a business that eliminates restrictions based on distance. The service will enable patients to access knowledgeable health care providers all over the world. Live connection between



patient and health care providers is possible as well as the ability of health care providers to consult on a case. There are also benefits such as ease of exchange of information, increased knowledge of patients, and improved access to medical information. These benefits contribute to an overall increase in the quality of health care. For example, people living in rural locations can take advantage of knowledgeable experienced health care professionals that they would not have been able to otherwise.

This service will help ease the minds of those with cardiovascular disease (CVD) as well as their family and friends. TeleCare's service will be targeted initially to those with existing heart problems who may live in fear that any activity will aggravate their condition. The service will alleviate some of that fear and allow the person suffering from CVD to enjoy life with the knowledge that they can monitor their condition at anytime of the day and get assistance immediately if needed. Further, studies have shown telemedicine-based services can achieve considerable cost savings in areas such as patient consultations with physicians, emergency room treatments, hospital admissions, and ambulance dispatches. This factor will be extremely important to health management organizations and employers that are not only potential clients for the service but are also critical to the successful promotion and distribution of the service to end-users.

TeleCare's medical staff will offer consultation, diagnosis, and emergency assistance to its patients. Each client will receive equipment necessary to monitor and report heart activity. A small portable electrocardiogram (ECG) device, that can be taken anywhere, will monitor any unusual heart activity. The device has three wires with 12 leads that attach to the chest area. As soon as clients have palpitations or chest discomfort, they take their own ECG, telephone the medical call centre using a toll-free number and replay the ECG over the phone to the 24 hour call centre staffed by nurses and supported by doctors on call.

TeleCare will have a call-centre located in the selected geographic location that will monitor their clients. As a part of their service, TeleCare will maintain a database with the complete medical history of each patient and a record of previous ECGs. These records can be accessed immediately by the nurse who can quickly compare the ECG against a previous base line. If there is any change, the nurse will advise the client to see a doctor. If needed, they will arrange an ambulance to pick them up and call the hospital to let them know they are on the way. TeleCare will then transmit the patient's medical history, most recent ECG and their base-line ECG to the hospital immediately via fax or e-mail.

There are two types of telemedicine systems: real-time (live) interactions between patient and health care provider or between two health care providers consulting on a case or store-and-forward technology, which involves the transmission of clinical data via a wide variety of media (i.e. disk, film, or tape) that are acted upon at a later time and then transmitted back to the originating site. While TeleCare will utilize store-and-forward technology to access baseline data, its primary systems will be real-time or live interactions between patient and health care provider.

## Management

The two primary shareholders in TeleCare are Ken Thompson and Kathy Smith. Ken and Kathy are both medical doctors that specialize in cardiovascular disease. They will serve as directors of TeleCare, provide necessary professional expertise from the company's head office in Clarenville and be involved in the management of the business. Both have experience with telemedicine-based initiatives through their involvement with the telemedicine facilities at Memorial University of Newfoundland. Ken also completed his MBA degree at Memorial and has worked as a marketing manager with a major pharmaceutical firm. Kathy comes from an entrepreneurial family and together with Ken has successfully established and managed other business ventures. Both have excellent credit ratings and proven histories of debt repayment having borrowed significant amounts in the past for personal and business purposes.

The combination of their educational backgrounds, entrepreneurial and management experience, and familiarity with telemedicine services provide key ingredients to the company's success. The owners have also made provision for other key management, professional and administrative personnel (details provided later in the report) and for a Board of Directors comprised of individuals with a balance of professional, technical and business acumen.

Since the company was formed in May 2000, the shareholders have been working jointly on the development aspects of the venture. Considerable effort has gone into technology assessment and the design of the emergency monitoring system. A feasible operating plan has now been developed. Company members have also been working on securing facilities, identifying any regulatory obstacles, assessing market potential, developing a marketing plan and obtaining initial orders.

## II. THE MARKET

### Potential Customers

In general terms, the end use customers for TeleCare services include individuals suffering from CVD. However, HMOs and major employers represent key customers for bulk/group orders. An HMO is a managed care entity that provides, offers or arranges for coverage of designated health services needed by plan members for a fixed, prepaid premium. Together with physicians, HMOs and major employers will also play important roles in the promotion and the distribution of TeleCare's services.

HMOs have access to a significant portion of the potential end-user market. Discussions with a number of HMOs indicate a high level of interest in TeleCare's services and demonstrate its market potential. To date, TeleCare has signed orders from HMOs and major employers representing 15% of projected first-year revenues.

### Market Size and Potential

CVD is defined as all diseases of the circulatory system according to the International Classification of Disease (ICD). The diseases included in this classification are:

- acute myocardial infarction (AMI),
- ischemic or coronary heart disease (IHD),
- valvular heart disease,
- peripheral vascular disease,
- arrhythmia,
- high blood pressure, and
- stroke.

Cardiovascular disease is the leading cause of death in Canada accounting for approximately 37% of all deaths in 1995 (Heart Disease and Stroke in Canada, 1996). In the United States cardiovascular disease has been the leading cause of death since 1900. In 1995, 41.5% of all deaths occurring in the U.S. were attributed to CVD (Heart and Stroke Statistical Update, 1998).

#### *Canada:*

It is estimated that 4.4% of Canadians over the age of 20 suffer from some form of CVD. See Appendix A for population by province and calculation of market potential of those individuals suffering from CVD. Population figures are taken from 1999 Statistics Canada Census. Statistics Canada groups the population figures into three categories, 0-14, 15-64, and over 65. The 15-64 and over 65 age categories were used to estimate the percentage of persons suffering from CVD in Canada.

**Table 1: Estimated Number of Individuals Suffering from CVD in Canada**

Province	Estimated number of individuals suffering from CVD in 1999
Ontario	406,643
Quebec	264,407
British Columbia	144,308
Alberta	102,626
Manitoba	39,664
Nova Scotia	33,669
Saskatchewan	35,286
New Brunswick	27,147
Newfoundland	19,538
Prince Edward Island	4,841
North West Territories	1,332
Yukon	1,051
Nunavut	741
<b>Total</b>	<b>1,081,253</b>

*United States:*

It is estimated that 22% of the population of the United States suffer from CVD (Heart and Stroke Statistical Update, 1998). See Appendix B for population by State and calculation of market potential of those individuals suffering from CVD. Population figures are taken from the 1997 United States Census. California, Florida and New York have been selected based on their high CVD populations, high population densities and active HMOs.

**Table 2: Estimated Number of Individuals Suffering from CVD in California, Florida, and New York**

State	Estimated number of individuals suffering from CVD in 1997
California	7,098,960
Florida	3,223,880
New York	3,990,140
<b>Total</b>	<b>14,312,980</b>

As illustrated by the previous data there is sufficient market potential in both Canada and the United States to support a telemedicine-based initiative.

## Competition

In 1989 there were only three telemedicine-based companies operating in the U.S. By 1994 this number had increased to twenty. As technology becomes more and more advanced the number of companies entering in this industry will increase. As a result of this increasing competition, TeleCare must have a targeted strategy when entering this market. The service that TeleCare offers must stand-out from the competition. TeleCare must differentiate its service by employing high-quality medical professionals and by offering quick professional service, thereby providing clients with the assurance that their emergency needs will be met.

There are a number of companies presently providing a variety of telemedicine services. The following have been identified as direct competitors for the services to be offered by TeleCare. However, it should be noted none of these companies are currently servicing the CVD market in Florida.

### A. TeleMedisys

TeleMedisys Corporation of Montreal is a privately owned company created in 1995 to provide telemedicine services to the general public and health care professionals. TeleMedisys is jointly owned by Medisys Health Group Inc, Bell Canada, and Inasco.

TeleMedisys was one of the first privately owned medical call centres established in Canada. It is staffed by trained nurses who use the telephone system and instruments to monitor clients with a number of ailments. TeleMedisys is currently operating in Quebec and Ontario. They charge their clients \$25.00 a month for its monitoring services. Prices for their monitoring devices range from \$50.00 to \$100.00.

Though TeleCare and TeleMedisys services are very similar, TeleMedisys' primary focus is on monitoring services for those suffering from asthma. Further, TeleMedisys actively targets continuous monitoring for diagnostic purposes rather than real time emergency monitoring. They are planning to enter the U.S. market late in 2001.

### B. Shahal Medical Services Ltd.

Shahal Medical Services Ltd., based in Israel, operates a medical monitoring centre that provides medical services including trans-telephonic diagnosing services and emergency treatment, through teams consisting of ICU and ER nurses, paramedics and physicians. They have developed a home-based emergency and telemedicine communications system that currently has 50,000 subscribers. Shahal Medical Services service patients with cardiac problems, those suffering from asthma and chronic obstructive pulmonary disease, as well as hypertensive patients. Subscribers pay up to \$50.00 per month for the service. The purchase price of the monitoring equipment ranges from \$100.00-\$175.00. Annual revenues are approximately \$17 million. Shahal does service the CVD market and they are currently investigating the North American market. Short to medium term plans suggest a focus on the two largest potential markets, namely California and New York.

### C. MedAction Health Group

Toronto-based MedAction's primary business involves a telephone triage whereby they charge subscribers a monthly fee for health information delivered by registered nurses over the phone. Subscribers dial a toll-free number and ask any medical questions that they want.

The primary target market for this product is individuals over the age of 55. For \$9.95 a month your family can call 24 hours a day, seven days a week, from anywhere in North America to obtain information and advice. The service is focused primarily on medical information and advice rather than providing diagnosis or emergency service. MedAction's primary challenge is to encourage Canadians to pay for a service that they have for free if they are insured.

MedAction has not entered the United States market; however, they are planning on a launch date of September 2001 for expansion of services into California.

TeleCare has a number of advantages over its competitors, which will allow TeleCare to enter and dominate the Florida market, including first-mover advantage, professional and knowledgeable staff, and sophisticated quality services. Further, TeleCare can potentially move into California and New York if it successfully sells the HMOs in Florida. These same organizations service the two larger states and a positive experience in Florida can be transferred easily to New York and California through the HMOs.

### Estimated Market Share and Sales

#### *Canada:*

As illustrated in Table 3, a conservative estimate of 1.0% market penetration in the first year translates into 10,812 customers in Canada.

**Table 3: Market Potential for Canada**

<b>Province</b>	<b>Estimated number of potential clients suffering from CVD based on achieving 1.0% market penetration</b>
Ontario	4,066
Quebec	2,644
British Columbia	1,444
Alberta	1,026
Manitoba	396
Nova Scotia	336
Saskatchewan	352
New Brunswick	272
Newfoundland	196
Prince Edward Island	48
North West Territories	14
Yukon	10
Nunavut	8
<b>Total</b>	<b>10,812</b>

*United States:*

Based on a conservative estimate of 1.0% penetration in the first year, the market potential in the three U.S. states is 143,130 (see Table 4).

**Table 4: Market Potential for California, Florida, and New York**

<b>State</b>	<b>Estimated number of potential clients suffering from CVD based on achieving 1.0% market Penetration</b>
California	70,990
Florida	32,238
New York	39,902
<b>Total</b>	<b>143,130</b>

Based on the analysis of the market potential TeleCare will enter the U.S. market with an initial short-term focus on Florida. A long-term strategy may include branching out and entering new markets such as California and New York.

## **Future Market Potential and Growth Opportunities**

Initial efforts carried out for this project have been directed primarily at assessing the market potential for a telemedicine-based initiative focusing on individuals suffering from CVD, especially those located in Florida. Future plans include a detailed market assessment of the following additional growth opportunities:

1. Expansion of CVD services into other US states.
2. Introduction of services targeted to those suffering from other diseases.
3. Expansion into overseas markets including the United Kingdom, Europe and Asia.
4. Introduction of similar services into the Canadian market.



### III. MARKETING STRATEGY

#### Target Market

The end-user is the ultimate target group. End-users are those individuals with CVD in the state of Florida. However, other groups will be targeted in an effort to effectively reach the end-users and to provide support for distribution and promotion. For example, HMOs, major employers, physicians (cardiologists), and health service agencies will be targeted. HMOs and employers, in particular, have vested interests in achieving the best health care for the lowest cost. IPA and combination model HMOs<sup>1</sup> represent the best prospects for group/bulk sales and offer the potential to reach a large number of clients in a relatively short period of time. Appendix C includes a list of Florida's HMOs ranked by enrollment. As indicated previously, discussions with HMOs and major employers have resulted in TeleCare obtaining orders for 15% of first-year projected revenues.

#### Promotion

A full-scale marketing campaign will be developed to effectively reach the end consumer and create awareness about TeleCare's services. A salesforce will be used to promote the benefits through individual and group presentations, especially to HMOs, major employers, and physicians. Promotional material will emphasize the advantages of the service to end-users and the potential savings to the health care system, especially to HMOs and to employers. Referrals from cardiologists should enhance end-user interest.

In addition to the direct-marketing component, a targeted advertising campaign will support the efforts of the salesforce. This campaign will include the use of television, magazine and radio and posters/displays in doctors' offices. Targeted programs, timeslots, and publications will ensure effective reach to the various target groups. TeleCare has enlisted the services of a major advertising agency to assist in this regard.

The public relations component of the campaign includes developing alliances with cardiac, stroke and health agencies throughout the state of Florida. Developing alliances with reputable organizations will increase the credibility of TeleCare. Co-operative promotional campaigns may also be possible.

Where possible the company will utilize resources and financial support of both levels of government for the promotional requirements of this project.

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<sup>1</sup> Under the IPA model, the HMO contracts with an association of medical professionals to provide medical services in return for a negotiated fee. The IPA in turn contracts with physicians who continue in their existing individual or group practices. Under the staff health model, the HMO employs physicians to provide health care to its members. All premiums and other revenues accrue to the HMO, which compensates physicians by salary and incentive programs. The combination model employs both IPA and staff approaches.

## **Distribution**

The service and ECG units will be distributed via direct sales through TeleCare's salesforce and through HMOs and major employers. Florida is a managed care state with approximately 33% of the commercial population enrolled in HMOs. When using HMOs as a primary method of distribution there is relatively easy access to a large client base in a short period of time. HMO's will facilitate early and quick access to the U.S. market. Furthermore, since some HMO's operate in multiple states, TeleCare can benefit from a reduction in the costs of promotional programs as the company expands into additional U.S. markets.

## **Pricing**

There are two components associated with TeleCare's service. First, there is the equipment, which can be purchased by individuals directly for \$80.00 or for \$70.00 on a bulk order or group purchase basis. The second component is the actual monitoring service. For \$27.50/month, or \$22.50 in the case of group/bulk orders, clients can obtain a subscription for the monitoring service. This subscription will enable them to call anytime of the day and consult with a qualified nurse with regard to any concerns or questions they may have. If a patient has taken their ECG reading and it is abnormal they can call a nurse and will be advised immediately if they should seek medical attention. The nurse can quickly access the clients' medical history and previous ECG readings on computer to determine if there is a problem.

## **IV. OPERATIONS PLAN**

There are three key requirements that are needed if TeleCare is to succeed: qualified health care professionals, knowledgeable and experienced management, and quality technology.

### **Personnel**

Table 5 outlines the management and staff positions that are needed to successfully operate TeleCare. The two owners will also act as directors of TeleCare. As Ken and Kathy are both doctors that specialize in cardiology, they will also provide assistance with diagnosis and information to clients. Ken and Kathy both have experience related to the telemedicine field. In addition to their combined cardiology experience of 20 years, Ken and Kathy have worked with the telemedicine services at Memorial University of Newfoundland (MUN). This experience combined with their training in CVD is an excellent foundation on which to build TeleCare. Ken also has an MBA degree and significant marketing experience gained through various positions in the pharmaceutical industry. Both have been involved in previous successful entrepreneurial ventures.

In addition, Ken and Kathy will hire a number of key management personnel, including a marketing manager, human resources manager and an operations manager. The operations manager, computer specialist, and nurse supervisor positions will be filled by individuals that work with Ken and Kathy and in whom they have a great deal of confidence with their skill and ability.

Technical expertise is also available from other company directors who possess skills in project related areas. One director is part owner of a company that is currently engaged in contract work servicing Memorial University's telemedicine facilities. Another board member is president of a telecommunications firm and is very familiar with the systems TeleCare will use. A third director is the owner/operator of a biomedical firm with clients around the world.

The reputation of the firm depends upon the knowledge and ability of the health care providers. Ten qualified nurses with experience in cardiology related problems will provide assistance to clients when they call the monitor centre. The centre will be staffed 24 hours a day and at any one time 3 nurses will be working a shift. There will also be a salesforce of 10 people responsible for contacts with HMOs, employer organizations, physicians and end-users.

In addition to these 40 full-time employees TeleCare will also have cardiologists on contract in Florida who can be called on for patient consultation and diagnosis.

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**Table 5: Personnel Requirements**

Position	Location	Number of Positions
Director/Cardiology Specialist	Clareville, NF	2
Operations Manager	Clareville, NF	1
Human Resources Manager	Clareville, NF	1
Junior IIR Coordinator	Clareville, NF	1
Computer Specialist/ Technician	Clareville and Florida	2
Marketing & Sales Manager	Florida	1
Sales Staff	Florida	10
Medical Manager	Clareville, NF	1
Nurse Supervisor	Florida	1
Nurses	Florida	10
Call centre phone operator/coordinator	Florida	2
Device Inventory Manager	Clareville, NF	1
Inventory Coordinator	Florida	1
Administrative Assistants	Clareville and Florida	4
Accounting Clerks	Clareville and Florida	2
<b>Total</b>		<b>40</b>

**Distribution/Set-Up**

The service will be offered via a monitor call-centre in Florida that will service the entire population of the state. The headquarters will be situated in Clareville, Newfoundland. The centre will have the medical history and ECGs of all their clients in a database. The centre will be staffed 24 hours a day, seven days a week. The headquarters will also house all patient information. A salesforce will be responsible for selling the ECG units and services. Once a customer signs-up for the service they will be contacted by the monitoring centre.

Prior to activating the service the client must provide the centre with their medical history and relevant files and at that time an ECG reading will be taken and recorded. The monitor centre can coordinate the transfer of a copy of the client's medical history once the client has given authorization. Once the client is set-up in the system an ECG unit will be provided to them.

The initial set-up time for the centre will be 2 to 4 months. The *start-up costs* include both capital and non-capital investments. The capital investments include: 1) Monitor Centre Computing and Communication Equipment; and 2) Nurse Workstations. Non-capital investments include: 1) salaries; 2) marketing materials; 3) training and hiring; 4) rent and utilities; 5) approvals and legal services.

*Ongoing expenses* include variable costs, cost of service, and marketing & sales expenses. Variable costs include costs such as commissions and devices. Ongoing expenses also include the cost of service such as salaries and malpractice insurance.

The Florida Board of Medicine has stated that a physician providing the primary read of a diagnostic test or study for a patient located in Florida must be licensed to practice medicine in Florida. Any physician who provides such as service without a Florida license would violate the prohibitions against unlicensed practice outlined in Chapter 458 - the Medical Practice Act, Florida Statutes.

Florida's only current statute relating to telemedicine is section 458.3255, Florida Statutes which provides *that only a Florida-licensed physician may order electronic-communications diagnostic-imaging or treatment services for a person located in Florida*. The bill would require licensure of any physician, wherever located, who has primary authority over the care or diagnosis of a Florida patient. Exempt from the proposed licensure requirement are certain physicians who are in consultation with a Florida-licensed physician and who do not exercise primary authority over the patient's care.

#### D. Confidentiality of Patient Records

Another area of legal concern in telemedicine is the issue of patient confidentiality. A healthcare provider's duty to maintain the confidentiality of medical data is at least as old and well accepted as the Hippocratic Oath: "What I may see or hear in the course of treatment or even outside the treatment in regard to the life of men, which on no account must one spread, I will keep to myself."

The nature of telemedicine encourages the creation and maintenance of electronic medical records, which are accessed by several stakeholders. It is therefore important that the records are protected from potential hackers. This can be easily accomplished. A confidentiality statement is included in Appendix D.

#### E. Liability Issues

Healthcare professionals who are involved in the practice of telemedicine are faced with a number of liability issues concerning their competence as healthcare professionals, as well as, the quality of the telemedicine transmission and equipment. These liability issues may potentially slow the advancement of telemedicine as healthcare professionals choose to limit their exposure to risk in a virtually uncharted territory.

The licensing and liability issues identified above do not pose major impediments to undertaking the proposed venture. Nurses from Newfoundland frequently move to Texas and Florida to undertake work and experience no difficulty meeting licensure requirements. Basically, they are required to sit a one-day exam. Similarly, there are two options available to TeleCare to ensure that doctors are able to provide services to patients resident in Florida. First, under a reciprocal arrangement, medical doctors from Newfoundland can register in Florida. Second, TeleCare can use doctors presently registered and practicing in Florida on a contractual on-call basis. In terms of liability, organizations such as Shahal have already demonstrated the feasibility of securing cost effective liability coverage from major insurers. There is no reason to believe that TeleCare's experience in this regard should be any different.

## V. FINANCIAL PLAN

A financial review of the venture was completed on the basis of the sales projections, cost estimates and pricing information identified in this report. The emphasis is on demonstrating the financial viability of the business through a profit and loss evaluation over the first three years. A cash flow analysis has also been completed to show the necessary operating financing and time to reach positive cash flow. The detailed financial projections are presented in Appendix E.

### Profitability Analysis

There are two types of revenues: revenues from the sale of services (subscription fees) and revenues from the sale of end-user devices. Subscription revenue accounts for 75% of total revenue in the first year increasing to almost 94% in the third year.

The results from the preparation of the pro forma profit and loss statements for the venture indicate that the company can be profitable under the given assumptions. A profit of approximately \$11,000 is projected for the first year of the venture. In years 2 and 3, the company's profitability increases significantly resulting in after tax profits of \$1,808,000 and \$3,074,000 respectively.

It should be noted the assumptions for interest expense and taxes are based on a full cost scenario. The project may be eligible for financial assistance that could reduce the borrowing requirements and therefore reduce interest costs. Also, there may be additional tax concessions that could reduce the tax liability.

### Cash Flow Analysis

The project's cash flow was evaluated for the first year of operation. It was assumed that the project would start in January and capital funding of \$200,000 would be approved. The first sales would occur in April and are assigned evenly to each month thereafter. Credit terms of 30 days are assumed for group/bulk sales. Overhead expenses were prorated for the first year and assigned evenly to each of the months.

Based on these parameters, the cash flow analysis is presented in Appendix E. The project will have a short-term cash requirement of approximately \$1,225,000 to cover the first year of operation. If the sales for the service are achieved and receivables collected, then a positive cash flow should be realized four months into the second year. The critical assumptions in this analysis are that sales and collections will be achieved. Any collection delays or sales shortfalls will greatly increase the operating credit requirements for the first year.

## Financing Considerations

The owners of TeleCare have indicated they are in a position to contribute \$100,000 equity to the venture. Based on the capital cost estimates and proposed operating scenario for the company it would appear the company will require additional financial support as follows:

Term Loans:	\$200,000 at startup and \$100,000 in each of years 2 & 3.
Operating Loan:	\$1,225,000 in year 1 and an average requirement of \$250,000 for the first four months of year 2.

This level of financing is the minimum required to initiate and to support the venture's first three years of operation.

## **VI. CRITICAL RISKS AND ASSUMPTIONS**

Inherent in the nature and status of this project are some basic risks that should be specified for both the owners and potential investors. The main areas of concern are as follows:

- **Schedule** – Timing of entry to market is critical since “first to market” results in significant competitive advantage. Any delays could result in the loss of such advantage and have a serious negative impact on the venture.
- **Legal** – Licensing requirements for nurses and physicians are under the control of each state. Market expansion into additional states results in increased costs and can be very time consuming.
- **Service** – The service is highly dependent on knowledgeable and professional staff that are in great demand. Human resource management skills are critical to ensuring effective recruitment and retention of key personnel.
- **Technology** – The system is not complex but may still have startup problems that could delay service in the short term.
- **Competitors** – It is inevitable that other companies will follow the lead of TeleCare. Consequently, there could be price-cutting as competitors try to establish sales.
- **Sales** – To date, the company has obtained sales commitments for 15% of first-year projected revenues. Therefore, the decision to begin operations has been reached largely on the basis of market potential.
- **Cash Flow** – The success of the venture depends on sales and cash flow. To develop the market requires a large outlay of operating funds in the short term and delays in cash receipts will result in requirements for additional operating credit.



## APPENDIX A

### Population and Market Potential for Canada

Province	1999 Population >15 years of age (Statistics Canada)	Estimated Number of Individuals Suffering from CVD in 1999
Ontario	9,241,879	406,643
Quebec	6,009,239	264,407
British Columbia	3,279,737	144,308
Alberta	2,332,405	102,626
Manitoba	901,456	39,664
Nova Scotia	765,207	33,669
Saskatchewan	801,954	35,286
New Brunswick	616,981	27,147
Newfoundland	444,052	19,538
Prince Edward Island	110,018	4,841
North West Territories	30,269	1,332
Yukon	23,892	1,051
Nunavut	16,840	741
<b>Total</b>	<b>24,573,929</b>	<b>1,081,253</b>

## APPENDIX B

### Population and Market Potential for United States

State	1997 Population (U.S. Census)	Estimated Number of Individuals Suffering from CVD in 1997
Alabama	4,319,000	950,180
Alaska	609,000	133,980
Arizona	4,555,000	1,002,100
Arkansas	2,523,000	555,060
California	32,268,000	7,098,960
Colorado	3,893,000	856,460
Connecticut	3,270,000	719,400
Delaware	732,000	161,040
District of Columbia	529,000	116,380
Florida	14,654,000	3,223,880
Georgia	7,486,000	1,646,920
Hawaii	1,187,000	261,140
Idaho	1,210,000	266,200
Illinois	11,896,000	2,617,120
Indiana	5,864,000	1,290,080
Iowa	2,852,000	627,440
Kansas	2,595,000	570,900
Kentucky	3,908,000	859,760
Louisiana	4,352,000	957,440
Maine	1,242,000	273,240
Maryland	5,094,000	1,120,680
Massachusetts	6,118,000	1,345,960
Michigan	9,774,000	2,150,280
Minnesota	4,686,000	1,030,920
Mississippi	2,731,000	600,820
Missouri	5,402,000	1,188,440
Montana	879,000	193,380
Nebraska	1,657,000	364,540
Nevada	1,677,000	368,940
New Hampshire	1,173,000	258,060
New Jersey	8,053,000	1,771,660
New Mexico	1,730,000	380,600
New York	18,137,000	3,990,140
North Carolina	7,425,000	1,633,500
North Dakota	641,000	141,020
Ohio	11,186,000	2,460,920
Oklahoma	3,317,000	729,740
Oregon	3,243,000	713,460

State	1997 Population (U.S. Census)	Estimated Number of Individuals Suffering from CVD in 1997
Pennsylvania	12,020,000	2,644,400
Rhode Island	987,000	217,140
South Carolina	3,760,000	827,200
South Dakota	738,000	162,360
Tennessee	5,368,000	1,180,960
Texas	19,439,000	4,276,580
Utah	2,059,000	452,980
Vermont	589,000	129,580
Virginia	6,734,000	1,481,480
Washington	5,610,000	1,234,200
West Virginia	1,816,000	399,520
Wisconsin	5,170,000	1,137,400
Wyoming	480,000	105,600
<b>Total</b>	<b>267,637,000</b>	<b>58,880,140</b>

## APPENDIX C

### LIST OF FLORIDA'S HMOS RANKED BY ENROLLMENT

<i>Rank</i>	<i>Name</i>	<i>Model</i>	<i>Status</i>	<i>Enrollment</i>
1	Blue Cross Blue Shield/Health Options	IPA	Profit	697,799
2	Humana Medical Plan, Inc.	Combination	Profit	513,314
3	AV-MED, Inc.	IPA	Non-Profit	335,544
4	HIP Health Plan of Florida, Inc.	IPA	Non-Profit	158,396
5	Principal health Care of Florida, Inc.	IPA	Profit	137,375
6	Neighborhood Health Partnership, Inc.	Combination	Non-Profit	111,074
7	CIGNA Health Care of Florida	Combination	Profit	103,203
8	Healthplan Southeast	IPA	Profit	75,507
9	Florida Health Care Plan, Inc.	Staff	Non-Profit	50,158
10	Total Health Choice, Inc.	IPA	Profit	28,398
11	Preferred Medical Plan, Inc.	Staff	Profit	24,739
12	JMII Health Plan	Combination	Non-Profit	21,080
13	Health First Health Plans, Inc.	IPA	Profit	19,754
14	Oxford Health Plans (FL), Inc.	IPA	Profit	15,285
15	Anthem Health Plan of Florida	IPA	Profit	11,131
16	Sunstar Health Plan, Inc.	Combination	Profit	6,445
17	Alpha Health Plan, Inc.	N/A	N/A	-
	<b>Total</b>			<b>2,309,202</b>

Compiled from the Florida Association of HMOs, 1997

**Notes**

1. These HMOs are members of the Florida Association of HMOs (FAHMO).
2. IPA HMO: The HMO contracts with an association of medical professionals to provide medical services in return for a negotiated fee. The IPA in turn contracts with physicians who continue in their existing individual or group practices.
3. Combination: Self-explanatory
4. Staff: This health model employs physicians to provide health care to its members. All premiums and other revenues accrue to the HMO, which compensates physicians by salary and incentive programs.
5. Enrollment numbers as of December 31, 1997.

## APPENDIX D

### Confidentiality Statement

This policy has been developed to assure that patient confidentiality is maintained whenever medical history and care of a patient is discussed for the purposes of educating hospital medical staff of employees. It is important to maximize the educational experience while protecting the confidentiality of patient information.

1. All medical data presented (i.e. ECG reports) will have the patient's name and medical number masked.
2. When a patient calls into the centre they will have a code number through which only a nurse can access the information.
3. Any use of medical information for the purposes of case discussion among employees of TeleCare will disguise all names.
4. The network that connects the two offices is secure within the TeleCare system with no possibility for data loss or unauthorized 'tapping' along this route.
5. All client medical information shall be stored in a secure area that only the nurses can access.

**APPENDIX E**  
**FINANCIAL PROJECTIONS**

**TeleCare  
Sales Forecast**

	2001	2002	2003
<b>Estimated Subscribers (1)</b>	32,000	48,000	64,000
<b>Revenue from Sale of ECGs (2)</b>	\$ 2,400,000.00	\$ 1,200,000.00	\$ 1,200,000.00
<b>Subscription Fee Revenue (3)</b>	\$ 7,200,000.00	\$ 14,400,000.00	\$ 19,200,000.00
<b>TOTAL</b>	<u>\$ 9,600,000.00</u>	<u>\$ 15,600,000.00</u>	<u>\$ 20,400,000.00</u>

**ASSUMPTIONS:**

**(1) Estimated Sales/Subscribers:**

Population with CVD - 3,223,880 x % market share  
7,098,960 X %  
market share.

1.0% of population suffering from CVD, the first year  
in the second year.

1.5% of population suffering from CVD, the second year  
in the third year.

2.0% of population suffering from CVD, in the third year

**(2) ECG Revenue:**

Average price of \$75 unit x # of units to new subscribers

Half of the subscribers will be private individuals @ \$80 unit while the remainder will be business/bulk subscribers @ \$70 unit

**(3) Subscription Fee Revenues:**

Average of \$25.00/month x # of subscribers

Half of the subscribers will be private individuals @ \$27.50 month while the remainder will be business/bulk subscribers @ \$22.50

**TeleCare**  
**Income Statement for Three Years**

	Year 1		Year 2		Year 3
<b>Revenue</b>					
ECG Sales	\$ 2,400,000	(1)	\$ 1,200,000		\$ 1,200,000
Subscription Fees	\$ 7,200,000	(2)	\$ 14,400,000		\$ 19,200,000
<b>Total Revenue</b>	<b>\$ 9,600,000</b>		<b>\$ 15,600,000</b>		<b>\$ 20,400,000</b>
<b>Less Cost of Goods Sold</b>					
for ECGs	\$ 2,080,000	(3)	\$ 1,040,000		\$ 1,040,000
<b>Total COGs</b>					
<b>Gross Margin</b>	<b>\$ 7,520,000</b>	<b>(4)</b>	<b>\$ 14,560,000</b>		<b>\$ 19,360,000</b>
<b>Expenses</b>					
Owners Salary	\$ 160,000	(5)	\$ 176,000		\$ 193,600
Management & Employee Wages	\$ 2,500,000	(6)	\$ 3,375,000		\$ 4,250,000
Rent	\$ 250,000	(7)	\$ 375,000		\$ 450,000
Utilities	\$ 24,000	(8)	\$ 36,000		\$ 48,000
Professional Fees & Licensing	\$ 1,500,000	(9)	\$ 1,000,000		\$ 1,000,000
Taxes & Licenses	\$ 1,000,000	(10)	\$ 1,000,000		\$ 1,000,000
Insurance	\$ 1,000,000	(11)	\$ 1,500,000		\$ 2,000,000
Interest Paid on Term Loan	\$ 21,120	(12)	\$ 27,840		\$ 32,640
Interest on Operating Line of Credit	\$ 109,675	(13)	\$ 12,375		\$ -
Advertising & Sales	\$ 1,000,000	(14)	\$ 1,750,000		\$ 2,250,000
Depreciation on capital equipment	\$ 40,000	(15)	\$ 60,000		\$ 80,000
Telephone + Equipment	\$ 450,000	(16)	\$ 600,000		\$ 700,000
Rental Equipment	\$ 500,000	(17)	\$ 750,000		\$ 1,000,000
Travel Expenses	\$ 300,000	(18)	\$ 315,000		\$ 330,750
Micellaneous	\$ 100,000	(19)	\$ 105,000		\$ 112,875
<b>Total Expenses</b>	<b>\$ 8,954,795</b>		<b>\$ 11,082,215</b>		<b>\$ 13,447,865</b>
Adjustment for initial 3 months	\$ 1,456,000				
<b>Net Income Before Tax</b>	<b>\$ 21,205</b>	<b>(20)</b>	<b>\$ 3,477,785</b>		<b>\$ 5,912,135</b>
Tax Expense	\$ 10,178		\$ 1,669,337		\$ 2,837,825
<b>Net Income After Tax</b>	<b>\$ 11,027</b>	<b>(21)</b>	<b>\$ 1,808,448</b>		<b>\$ 3,074,310</b>



## Notes to Income Statement

- Note 1:**  $\$80 \times 16,000 + \$70 \times 16,000 = \$2,400,000$   
Refer to Sales Forecast.
- Note 2:**  $\$27.50 \times 9 \times 16,000 + \$22.50 \times 9 \times 16,000 = \$7,200,000$   
Refer to Sales Forecast.
- Note 3:**  $\$65 \times 32,000 = \$2,080,000$
- Note 4:**  $\$9,600,000 - \$2,080,000 = \$7,520,000$
- Note 5:** The owners' salaries are \$80,000/person in the first year. The salaries increase by 10% in the second and the third year.
- Note 6:** In addition to the two owners/doctors, TeleCare will employ 40 employees (management and staff) throughout the 2 offices in the first year. Employee wages have been increased in years 2 and 3 in proportion to the increase in sales since expansion will require significant additional personnel. This figure also includes provision for hiring, training and skill maintenance fees.
- Note 7:** Rental fees for office space have also been increased in years two and three to reflect additional space requirements.
- Note 8:** On average, utilities are \$1,000/month x 2 locations x 12 months = \$24,000. Increased in years 2 and 3 to reflect additional space.
- Note 9:** As a result of getting permits and licenses to practice medicine in Florida the first year allocation is high compared to years 2 and 3 when it is estimated expenses will decrease by approximately 33%. Also, the allocation is high as a result of legal consultations regarding potential liability issues.
- Note 10:** Taxes and licenses would include such items as operating expenses and property taxes. Licenses also include all fees involved with permits and licenses required to practice medicine.
- Note 11:** Approximately \$1,000,000 needed to insure (including malpractice insurance) the call centre. Insurance requirements have been increased each year to reflect the increase in the number of subscribers.
- Note 12:** See attached interest calculation for term loan.
- Note 13:** See attached interest calculation for operating line of credit.

- Note 14:** Expenses include advertising campaign, promotional materials, sales commissions, and public relations fees. The increase in years 2 and 3 is attributable primarily to the increase in commissions.
- Note 15:** See attached depreciation schedule for capital equipment.
- Note 16:** Fees include telephone and telecommunication equipment for both offices. Increases in the second and third years reflect additional requirements.
- Note 17:** Rental equipment includes lease of monitor centre computing and communication equipment, nurse workstations, and medical equipment. Requirements have been increased in years 2 and 3 in proportion to the increase in subscribers.
- Note 18:** Travel expenses for sales staff and travel between the two offices. These expenses are projected to increase at 5% a year.
- Note 19:** 10% additional allocation.
- Note 20:** Net Income = Gross Margin - Expenses
- Note 21:** The income tax rate is 48%.
- Assumptions:**
- Assumption 1:** Overhead expenses have been estimated at a reduced but gradually increasing amount for the first 3 months (January – March) and have been allocated evenly over the remaining 9 months (April to December) of the first year.
- Assumption 2:** No dividends will be paid for the first three years.
- Assumption 3:** All dollars are in Canadian funds.

## Interest Expense Schedule

### 1. Term Loans

**Assumptions:** 5 year loans @ 15%  
Interest expense = 33% in year 1, 27% in year 2 and 21% in year 3

**Loan 1** \$200,000 @ 15% = monthly payment of \$4,400  
Total payment = \$264,000; interest = \$64,000

Year 1:  $0.33 \times 64,000 = \$21,120$   
Year 2:  $0.27 \times 64,000 = \$17,280$   
Year 3:  $0.21 \times 64,000 = \$13,440$

**Loan 2** \$100,000 @ 15% for 5 years = monthly payment of \$2,200  
Total payment = \$132,000; Interest = \$32,000

Year 2:  $0.33 \times \$32,000 = \$10,560$   
Year 3:  $0.27 \times \$32,000 = \$8,640$

**Loan 3** \$100,000 @ 15% for 5 years = monthly payment of \$2,200  
Total payment = \$132,000; Interest = \$32,000

Year 3:  $0.33 \times \$32,000 = \$10,560$

Term loan interest:	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Loan 1:	\$21,120	\$17,280	\$13,440
Loan 2:		\$10,560	\$8,640
Loan 3:			<u>\$10,560</u>
<b>Total term loan interest</b>	<u>\$21,120</u>	<u>\$27,840</u>	<u>\$32,640</u>

### 2. Operating Line of Credit

**Assumptions:** Based on cash flow projections the operating credit requirements vary between \$355,000 and \$1,225,000.

Interest on the operating line of credit is based on the average closing balance requirements over the 11 months 12 months.

15% interest rate

**Calculation of Operating Line of Credit:**  $\$8,774,128 / 11 = \$797,648$

**Interest in Year 1:**  $\$797,648 \times 15\% \times 11/12 = \$109,675$

**Interest in Year 2:**  $\$250,000 \times 15\% \times 1/3 = \$12,375$

### Depreciation Schedule

The estimate for depreciation is based on the straight line method for capital expenditures.

Year 1:            \$200,000/5 years = \$40,000/year

Year 2:            \$100,000/5 years = \$20,000/year

Year 3:            \$100,000/5 years = \$20,000/year

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Depreciation expense	\$40,000	\$60,000	\$80,000

TeleCare												
Projected Statement of Cash Flows												
For the Period January 01 to December 31 2001												
	Jan	Feb	Mar	April	May	June	Jul	Aug	Sept	Oct	Nov	Dec
<b>Cash Inflows</b>												
Term Loan	200,000											
ECG unit sales: private				146,666	146,666	146,666	146,666	146,666	146,666	146,666	146,666	146,666
ECG unit sales: group				440,000	440,000	440,000	440,000	440,000	440,000	440,000	440,000	440,000
Subscriptions: private				586,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666
Subscriptions: group												
<b>Total Receipts</b>	200,000			586,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666	1,066,666
<b>Cash Outflows</b>												
Capital Expenditures	100,000											
Term Loan Principal Pmt		3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333
Term Loan Interest		1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Overhead Expenses	200,000	250,000	300,000	735,333	735,333	735,333	735,333	735,333	735,333	735,333	735,333	735,333
ECG Units			177,780	177,780	177,780	177,780	177,780	177,780	177,780	177,780	177,780	177,780
Delivery Expense			53,335	53,335	53,335	53,335	53,335	53,335	53,335	53,335	53,335	53,335
<b>Total Disbursements</b>	300,000	355,093	482,873	971,541	971,541	971,541	971,541	971,541	971,541	971,541	971,541	971,541
<b>Cash Increase/Decrease</b>	-100,000	-355,093	-482,873	384,875	95,125	95,125	95,125	95,125	95,125	95,125	95,125	95,125
<b>Opening Balance</b>	100,000			837,966	1,222,841	1,127,716	1,032,591	937,466	842,341	747,216	652,091	556,966
<b>Closing Balance</b>	-	-355,093	-837,966	1,222,841	1,127,716	1,032,591	937,466	842,341	747,216	652,091	556,966	461,841

**Assumptions:**

1. There will be a 3 month set-up period. Therefore there will be no sales from January - March.
2. Sales are assigned evenly over April - December.
3. ECG units will be paid for by private customers in the month of sale; 30 day credit terms accompany group sales
4. Subscription fees for private individuals will be paid at the beginning of each month; 30 day credit terms accompany group sales

**Calculations:**

ECG unit sales = \$2,400,000/9 months; 50% to private individuals and 50% to business  
Subscription fees = \$7,200,000/9 months; 50% to private individuals and 50% to business  
Term loan payment: \$200,000/60 months  
Term loan interest: \$21,120/12 months  
ECG Units: \$50 per unit. There will be a build up of inventory to ensure two months of sales in stock; 30 day credit terms.  
Delivery Expense: \$15 per unit

<b>TeleCare Balance Sheets</b>		
	<b>Opening Balance Sheet</b>	<b>31-Dec-01</b>
<b>Current Assets</b>		
Cash	\$ 100,000	
Accounts Receivable		\$ 480,000
Inventory		\$ 355,560
<b>Total Current Assets</b>	<b>\$ 100,000</b>	<b>\$ 835,560</b>
<b>Total Fixed Assets</b>		
Capital Equipment (net after reserve for deprec.)		\$ 160,000
<b>Total Assets</b>	<b>\$ 100,000</b>	<b>\$ 995,560</b>
<b>Liabilities</b>		
Term Loan		\$ 163,337
Tax Payable		\$ 10,178
Operating Loan		\$ 461,841
Accounts/Accrued Payables		\$ 249,177
<b>Total Liabilities</b>		<b>\$ 884,533</b>
<b>Equity</b>		
Owners' Equity	\$ 100,000	\$ 100,000
Retained Earnings		\$ 11,027
<b>Total Liabilities and Owners' Equity</b>	<b>\$ 100,000</b>	<b>\$ 995,560</b>

## PROTOCOL FOR BUSINESS PLAN EXPERIMENT

### Introduce the research project

Thank you for agreeing to participate in this research project. This is the third and final stage in a study designed to further our understanding of the financing requirements of small and medium-sized enterprises and the processes employed by financial institutions and government agencies in meeting these needs. The two earlier stages of the project involved a survey of entrepreneurs and interviews with senior government and bank officials. The primary purpose of the present component of the study and the reason for your participation is to document the risk assessment/evaluation processes utilized by banks and government agencies when assessing applications for financing.

### Provide assurance of confidentiality

You have my assurance that the information collected for this study will be kept in strictest confidence. Your input will be aggregated with others to enable comparisons to be made among the various participating organizations. Results will be reported such that it will not be possible to identify specific individuals or specific organizations.

### Ascertain the stages of the loan/financing review process

Before we proceed with the present experiment, could you please briefly outline the sequence of events or process that you normally follow when presented with a request for financing such as this one.

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On a scale of 1 to 7 where 1 = never and 7 = always, how frequently would you do the following?

Meet with client prior to initial review	1	2	3	4	5	6	7
Conduct a preliminary review	1	2	3	4	5	6	7
Contact client for information	1	2	3	4	5	6	7
Contact others for information	1	2	3	4	5	6	7
Consult with colleagues	1	2	3	4	5	6	7

**APPENDIX 4.7**  
**PROTOCOL FOR BUSINESS PLAN EXPERIMENT**



## **Briefly describe the present experiment and outline the think aloud instructions**

The experiment today focuses on the initial review of a business plan. Following this review, I would like you to undertake the usual evaluation and due diligence. I will return at a later date to obtain your input on that part of the process.

For today's experiment I am interested in what you think about when you conduct your initial review of a business plan or financing proposal. In order to do this I am going to ask you to **THINK ALOUD** as you review a proposal. What I mean by think aloud is that I want you to tell me **EVERYTHING** you are thinking while you review the business plan, including all thoughts, questions, opinions and issues. I would like you to talk aloud **CONSTANTLY** while you review the plan. I don't want you to try to plan out what you say or try to explain or justify to me what you are saying. Just act as if you are alone in the room speaking to yourself. It is most important that you keep talking. If you are silent for any long period of time I will remind you to talk. Your thoughts will be recorded for later transcription. Do you understand what I want you to do?

Good, now we will begin with some practice problems. First, I want you to multiply these two numbers in your head and tell me what you are thinking as you get an answer. **What is the result of multiplying 24 x 36?**

Good, now I will give you another practice problem before we proceed with the main experiment. **How many windows are there in your house? Please remember to vocalize what you think about as you try to answer that question.**

Good, now let's proceed to the experiment. Here is a business plan for a new venture. I would like you to conduct the initial review. Please take the normal amount of time you would usually spend on this review. Feel free to make notes and/or to use a calculator. I will remain in the room while you complete the review but only to remind you to keep talking. Try your best to ignore the tape recorder and me and remember to please speak loudly and clearly to facilitate the recording and transcribing. If you have questions, please hold them until after you've completed the review.

### **Debrief account manager**

Thank you! I think that went very well. Do you have any immediate questions or points of clarification (also address any noted Q's during the verbal protocol process)? To what extent did that process (time & circumstances) parallel your usual initial review?

<b>Not at all = 1</b>	<b>Fairly similar = 4</b>	<b>Virtually the same = 7</b>
1      2	3      4      5	6      7

I would now like to get your initial reaction to a number of aspects of the proposal. Compared to other loans/investments in your portfolio to firms in the same or similar industry, how would you rate this proposal (on a scale of 1 to 7 where 1=well below average, 4=average and 7=well above average) in each of the following areas?

	1=well below average		4=average		7=well above average		
	1	2	3	4	5	6	7
a. market potential	1	2	3	4	5	6	7
b. business plan	1	2	3	4	5	6	7
c. collateral/security available	1	2	3	4	5	6	7
d. proven product/service	1	2	3	4	5	6	7
e. other funding available	1	2	3	4	5	6	7
f. stage of development of firm	1	2	3	4	5	6	7
g. track record of the entrepreneurs	1	2	3	4	5	6	7
h. uniqueness of product/service	1	2	3	4	5	6	7
i. potential cash flow	1	2	3	4	5	6	7
j. management team	1	2	3	4	5	6	7
k. demonstrated market acceptance	1	2	3	4	5	6	7
l. logistics and facilities	1	2	3	4	5	6	7
m. general economic conditions (timing)	1	2	3	4	5	6	7
n. other (specify _____ _____)	1	2	3	4	5	6	7

### Close the interview

As I mentioned previously, I would now like you to complete your review of the business plan undertaking the usual due diligence process (confirm the process that was outlined at the beginning of this session). If you identify any information gaps could you please submit a written request (e-mail is fine) for additional information to me as the client. Once you've completed your assessment I will return to conduct a structured interview on various aspects of the review process and the financing decision. At the end of the process, I would like to review the complete file, including the business plan, your notes and any supporting documentation.

How long do you think it will take you to complete your review? Can you contact me as soon as you have identified any additional information you require? Perhaps we can arrange the follow-up interview at that time.

**APPENDIX 4.8**  
**ACCOUNT MANAGER INTERVIEW PROTOCOL**

## INTERVIEW PROTOCOL FOR ACCOUNT MANAGERS

### Section I - Questions Concerning the Risk Assessment and Review Process of Business Plans/Financing Applications

1. Please indicate the decision on the financing application:

- recommend approval of amount requested     referred up   
 recommend approval of lesser amount   
 do not recommend approval     more information required  (specify)

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2. Which of the following, if any, did you identify as issues/problems (shortcomings) with this proposal? If applicable, which were the key factors in your decision to reject the application or reduce the amount of financing approved?

	Issue/Problem	Key Factor
a. Insufficient collateral/security	<input type="checkbox"/>	<input type="checkbox"/>
b. Insufficient cash flow	<input type="checkbox"/>	<input type="checkbox"/>
c. Insufficient income or revenue	<input type="checkbox"/>	<input type="checkbox"/>
d. Business too risky	<input type="checkbox"/>	<input type="checkbox"/>
e. Limited management expertise	<input type="checkbox"/>	<input type="checkbox"/>
f. Didn't fit my organization's rules/requirements	<input type="checkbox"/>	<input type="checkbox"/>
g. Other (specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>

3. Of the factors noted above which are the three most important in order of importance?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

4. Compared to all loans/investments in your portfolio, how would you rate the overall risk of firms in this industry?

<b>Well Below Average</b>		<b>Average</b>			<b>Well Above Average</b>	
1	2	3	4	5	6	7

5. Compared to all loans/investments in your portfolio, how would you rate the overall risk of this firm?

Well Below Average		Average			Well Above Average	
1	2	3	4	5	6	7

6. If you recommend financial support in this case, please indicate the details of the proposed financing package:

i. type of financing and purpose (note any that are CSBFA with gov't. guarantee)

\_\_\_\_\_

ii. amount of financing \_\_\_\_\_

iii. interest rate \_\_\_\_\_

iv. term \_\_\_\_\_

v. fees charged \_\_\_\_\_

vi. security required:

- personal guarantee and amount \_\_\_\_\_
- charge against personal assets \_\_\_\_\_
- registered assignment of book debts \_\_\_\_\_
- other business collateral \_\_\_\_\_
- types of security instruments used \_\_\_\_\_

vii. loan/financing conditions:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

viii. monitoring provisions:

\_\_\_\_\_  
\_\_\_\_\_

7. Compared to other loans/investments in your portfolio to firms in the same or similar industry, how would you rate the overall risk of this loan?

<b>Well Below Average</b>	<b>Average</b>	<b>Well Above Average</b>	
1	2	3	4
5	6	7	

8. Please provide the following information on the review process that you followed in this case:

i. Internal sources used/consulted:

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ii. External sources used/consulted:

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iii. Were any terms imposed/changed by your manager or regional/head office?  
Please specify:

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iv. To what extent were your recommendations influenced by the likelihood of others (i.e. manager or regional/head office) approving or making changes to the financing terms?

<b>0=Not at all</b>	<b>5=Very much</b>
0	5
1	4
2	3

9. Compared to other loans/investments in your portfolio to firms in the same or similar industry, how would you rate this proposal in each of the following areas?

	1=well below average		4=average		7=well above average		
	1	2	3	4	5	6	7
a. market potential	1	2	3	4	5	6	7
b. business plan	1	2	3	4	5	6	7
c. collateral/security available	1	2	3	4	5	6	7
d. proven product/service	1	2	3	4	5	6	7
e. other funding available	1	2	3	4	5	6	7
f. stage of development of firm	1	2	3	4	5	6	7
g. track record of the entrepreneurs	1	2	3	4	5	6	7
h. uniqueness of product/service	1	2	3	4	5	6	7
i. potential cash flow	1	2	3	4	5	6	7
j. management team	1	2	3	4	5	6	7
k. demonstrated market acceptance	1	2	3	4	5	6	7
l. logistics and facilities	1	2	3	4	5	6	7
m. general economic conditions (timing)	1	2	3	4	5	6	7
n. other (specify _____ _____)	1	2	3	4	5	6	7

10. Any additional comments concerning factors mentioned during the evaluation or risk assessment process and any clarification of information obtained from the review of verbal protocols/documentation (including the importance of identified information requirements):

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**Section II - Questions Concerning Account Managers**

1. How long have you worked in your present capacity (account manager, industrial/business development officer, etc.)

with your current employer? \_\_\_\_\_ with a previous employer? \_\_\_\_\_

2. In your present capacity do you specialize in or focus on particular industry sectors?

Yes  No  (go to #3)

i. If yes, please indicate which sectors

\_\_\_\_\_  
\_\_\_\_\_

ii. Do you consider any of these sectors to be knowledge-based?

Yes  No

iii. If yes, which ones do you consider to be knowledge-based?

\_\_\_\_\_

3. If you do not specialize in particular sectors, do you have dealings with knowledge-based businesses? Yes  No

If yes, which types of businesses do you consider to be knowledge-based?

\_\_\_\_\_

4. How would you rate your knowledge of the type of business presented in this proposal?

**1=Very Low**

**7=Very High**

1    2    3    4    5    6    7

5. Please provide the following information on yourself:

i. lending approval limits \_\_\_\_\_

ii. education (highest level) \_\_\_\_\_

iii. any special training \_\_\_\_\_



6. Does your organization have specific goals or objectives for the knowledge-based sector (target for risk exposure, profitability or revenue growth)?

Yes  No  If yes, please provide details.

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7. Are you (as an account manager or industrial/business development officer, etc.) encouraged to attract KBBs any more than other businesses?

Yes  No  If yes, please explain how.

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8. Do you have any special training to deal with KBBs? Yes  No   
If yes, please describe the training and how it was obtained.

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9. Are there differences between your organization's systems, policies and procedures (loan evaluation, decision making, etc.) for dealing with KBBs and those for dealing with traditional SMEs)?

Yes  No  If yes, please briefly indicate the differences.

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10. Are you provided with any additional support to deal with KBBs?

Yes  No  If yes, what type of support (provide examples and explore both internal and external sources)?

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11. If yes to #10, does this support differ from that available to you when dealing with traditional firms?

Yes  No  If yes, how does it differ?

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12. Do you have any other comments or observations on the business proposal or on this survey?

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