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***COMPETITIVE PROFILE OF NORTH AMERICAN
TECHNOLOGY REGIONS***

by

DANIELA DE CECCO, B.Comm (Honours)

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

School of Business
Carleton University
Ottawa, Ontario
September 9, 1997

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and Research acceptance of the thesis

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Supervisor

Chair, School of Business

School of Business
Carleton University

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to my family and friends

ABSTRACT

Attempts made at the local level to attract high technology investment has necessitated a greater understanding of the factors that are important to these companies when selecting a site for potential investment. This research examined the images that high technology investors within North America form of five technology intensive regions: Ottawa (Ontario), Guelph-Cambridge-Kitchener/Waterloo (Ontario), Boston (Massachusetts), Raleigh (North Carolina) and Palo Alto (California). A sample of 164 companies revealed that there are considerable differences between regions based on specific location variables. Palo Alto had the highest average rating score, closely followed by Raleigh and Boston which tied for second. Ottawa ranked fourth followed by CTT. This research also examined the motives and importance of various factors that investors in the computer hardware, software, and telecommunications sectors, consider when selecting investment sites and the information sources used. Overall, the information gathered from this study should assist policy makers in developing appropriate marketing strategies to attract high technology investment.

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1. INTRODUCTION

Globalization of markets has given many cities the opportunity to become what is defined in the literature, which encompasses academic, press, media, and promotion literature, as a *world* or *international city*. Many cities strive to possess a high percentage of the world's economic activity, thus enabling them to develop into international actors and acquire world status. During this century an increase in trade liberalization has given cities a greater opportunity to acquire this status.

Trade liberalization has resulted in many nations participating in regional trade agreements such as NAFTA and the European Union. By participating in such agreements "national governments voluntarily give up some of their ability to introduce measures to support the industries, regions and factors of production which cannot meet the challenges of international competition" (Kresl 1992, p. 151). Internationalization has thus resulted in a new order where cities are responsible for ensuring their own economic development. As a result, cities are competing on the international arena with other cities and even other nations for elements such as foreign direct investment (FDI). The rise in the number of international cities is indicative that attracting FDI does not only occur at the supra-national or national level. Rather, numerous places at sub-national levels also attempt to attract this investment. For example, the eleven municipalities within the Ottawa-Carleton region have joined forces to attract FDI. Likewise, the urban centres of Kitchener-Waterloo, Cambridge and Guelph, known as Canada's Technology Triangle (CTT) have also united to attract investment to their region.

Regardless of how the geographic area is defined, internationalization has led many places to actively seek FDI. “Places” need to be aware of how investors perceive them as certain locations for investment. A place is defined as a geographic area with a specific identity (Gold and Ward 1995).

In the country-of-origin literature, it has been noted that consumers form different country images that affect their purchasing behaviour. With the exception of researchers such as Wells and Wint (1991), Wee, Lim and Tan (1993) and researchers from the Carleton School of Business (D'Souza 1993, Papadopoulos and Heslop 1993, and Kalligatsi 1996), little research has been undertaken regarding the images that companies form of countries concerning their potential as locations for investment. Even less research has been undertaken regarding the images that companies form of cities or regions concerning their potential as locations for investment.

Yet, it is vital that cities become aware of their image and its impact on investment decisions. Cities that develop image tracking systems are better able to monitor investor's perceptions. Corrective steps can then be initiated if it is determined that investors have formed a negative or an incorrect image of a specific location (Barich and Kotler 1991). A place that realizes who its competitors are and the image that investors hold can develop appropriate marketing strategies (Wee, Lim and Tan 1993).

This research was part of a larger study carried out under the umbrella of the International Business Study Group (IBSG) concerning the relationship between country-of-origin effects and investment decisions. The thesis sought to address the gap in the literature by determining the images that investors form of various cities/regions and how these images may affect their willingness to invest in them. Similar to studies conducted by D'Souza (1993), Wee, Lim and Tan (1993) and Kalligatsi (1996), it examines the motives and importance of various factors that investors consider when selecting investment sites; the information sources used; the demographics of the responding firms; and, profiling the investment site under consideration. As noted, this research differs in that the image of various cities/regions, rather than countries, will be examined as investment sites. The research was also unique in that focus is placed on high technology companies which have higher than average R&D spending and/or proportion of scientific and technical workers (Joint Economic Congress of the United States 1982).

The study focuses on examining the images of five North American cities/regions as areas for investment by high technology companies. Specifically, it compares the Ottawa-Carleton region (Ontario) to Canada's Technology Triangle (CTT) comprising the cities of Guelph, Cambridge and Kitchener-Waterloo (Ontario), Raleigh (North Carolina), Palo Alto (California), and Boston's Route 128 (Massachusetts). Determining the comparative profiles of these five high technology centres can benefit all the cities in this study. A more specific interest of the study is the Ottawa-Carleton region, where a vast amount of discussion has occurred among local policy makers regarding this region's attempts to market itself to high

technology firms. Ottawa has been defined as *Silicon Valley North*, and the findings from this study examine whether or not investors agree with this description.

The subject is important for the Ottawa Carleton region, since the downsizing of the federal government placed it in a position where a substantial proportion of its constituents faced potential unemployment. However, high levels of unemployment did not arise. According to the *Ottawa Citizen* this region has transformed itself into "an entrepreneurial, private-sector economy... a job-creating machine, clawing back three-quarters of the jobs lost in the wake of the 1995 federal budget" (July 16, 1996, C2). Denzil Doyle, chairman of Capital Alliance Ventures Inc., predicts that by the year 2000 this region will have over 55,000 high technology workers. He also noted that for every high technology position created an additional four indirect jobs, e.g. printing, graphics, travel agents will be created (Ottawa Sun, September 25, 1996, HT5). Greater effort has been taken by the local government, businesses, citizens and media to develop potential strategies that encourage the continued growth of high-technology companies.

For these strategies to succeed, the importance of determining the region's image cannot be overemphasized. Cities aspiring to attain world stature will need to develop an image that attracts investors, and this can only be accomplished if they continually re-evaluate and improve upon the image held by investors. The findings from this study will provide urban policy makers from each of the five high technology centres in North America with information of this kind, thus assisting them in developing effective marketing strategies. As

well, this research will benefit corporate decision makers. The country of origin literature has emphasized that consumers may use a product's origin as an indicator of the quality of the product. Consequently, this research will provide corporate decision makers, located in the five North American technology centres, with information regarding how products from the various cities/regions may be perceived by their customers.

2. LITERATURE REVIEW

It is important to consider various fields of literature to understand the process by which cities attain world status. A city's ability to attract investment is necessary for its economic development, consequently, it is important to understand what factors investors consider when selecting potential markets. International Market Selection (IMS) literature considers various determinants, such as market size and growth, tariff and non-tariff barriers to trade, etc. Country of origin literature places emphasis on the image that investors form of certain locations as an important determinant to market selection. Another issue that affects a city's ability to attract FDI will be the relationship that exists among urban actors (e.g. local government, businesses, constituents). Disagreement amongst these parties may limit the effectiveness of policies necessary for economic growth, more specifically attracting high technology companies which is the focus of this research.

2.1 FOREIGN DIRECT INVESTMENT

2.1.1 Benefits of Foreign Direct Investment

Foreign Direct Investment (FDI) stimulates the economic development and growth of the host country. Multinational corporations (MNC) bring to the host country capital, technology, management expertise, employment and market development (Investment Canada 1991; Wee, Lim and Tan 1993). A study by WEFA Canada, a Toronto based economic think tank, postulated that FDI has job creation potential double to five times that of domestic investment. The numerous desirable characteristics associated with FDI compel many countries to market themselves as sites for this investment. In recent years there has been

an increase in the number of players who are actively competing in the arena for FDI. Previously, developing nations relied upon their natural resources or large domestic markets to attract investment. Recently, however, developing nations have had to compete directly with industrial nations that have begun to court not only firms from other industrial nations but also firms from developing nations that "were beginning to spawn their own multinational enterprises" (Wells and Wint 1990, p. 2). In 1967 developing countries as a group attained a 30.6 percent share of world direct investment; this share dropped to 22.1 percent by 1987 (Investment Canada 1991). As well, developing countries are actively encouraging foreign investment in order to pay off the rising debt service obligations they incurred from excessive borrowing during the 1970s (Wells and Wint 1990). However, the vast amount of investment flows remains within the OECD region. At the end of 1993, approximately 80 percent of worldwide inflows and 90 percent of worldwide outflows occurred within this area. The direct investment position for member countries reached \$ 1,584 billion for outward stock and \$1,089 billion for inward stock. Poor macroeconomic performance in major OECD countries in the early 1990's led to a decline in FDI flows, but since 1994, outflows have increased by 12% and inflows by 35% to reach about \$142 and \$187 billion, respectively. (OECD 1995)

In 1985, the Canadian government signalled its attempt to attract both domestic and international investment by replacing the Foreign Investment Review Agency (FIRA) with Investment Canada. FIRA had been criticized for its screening of incoming investment, where investors had to establish that their investment would bring 'significant benefit' to the Canadian economy. For example, the Financial Times of London had blamed the

"sluggishness of the investment in Canada" on the policies of FIRA. In June 1985, the Investment Canada Act was implemented and as noted by Brian Mulroney, then Prime Minister, "Canada is open for business again". Investment Canada actively promotes this country as a place for investment (The Conference Board of Canada 1987; Investment Canada 1991). Since its inception, the amount of FDI to Canada has increased. The stock of FDI in Canada grew by 86% between 1985 and 1995, reaching some \$168 billion in 1995, with annual gross inflows averaging \$10 billion in recent years (Department of Finance Canada 1996; Statistics Canada 1996).

Although countries gain substantially from FDI, many organizations also benefit from investing abroad. MNCs seek to invest abroad in order to gain access to overseas markets, new technology, skilled human resources, capital resources and enhancement of the tax base (Punnett and Ricks 1992). However, of the two parties, it is the MNC which holds the greatest degree of leverage in comparison to the country. MNCs are able to relocate to the country that best satisfies their present needs, while a country remains place-bound. Consequently, many nations will actively entice MNCs by initiating such policies as tax holidays in order to enable them to acquire the numerous benefits associated with FDI (Investment Canada 1991). Brewer (1993) identified numerous government policies which create market imperfections and which increase FDI. Government policies can include protectionist import policies, weak enforcement of intellectual property protection, subsidies on inbound FDI, implementation of anti-dumping measures against imports, and government procurement policies that discriminate against foreign firms but not against foreign-owned

domestic firms. The effectiveness of these policies in any given country will be relative to those policies offered by other countries. Governments may offer similar policies, but all other things being equal, the MNC will invest in the country whose policies are more extensive and advantageous.

2.1.2 International Market Selection

Attracting FDI stimulates the economy and thus fortifies the competitive position of a place. Consequently, it is important for places to understand how investors select their markets. Armed with this knowledge, places can then develop and market themselves as desirable sites for investment.

Papadopoulos and Denis (1988) reviewed the literature regarding the most commonly used International Market Selection (IMS) decision making approaches. They classified the approaches as being either qualitative or quantitative. The qualitative approach comprises the "systematic gathering and analysis of qualitative information about one or a handful of potential country markets" (p. 47). The quantitative approach is more extensive and involves the analysis of all or the majority of country markets. Although both approaches are used by organizations, the researchers noted that the majority of enterprises selected foreign markets based on intuition. The failure to consider various host country variables, (e.g. host employment and profit repatriation regulations) can undermine an organization's ability to successfully operate in various foreign markets.

Davidson (1980) set out to explain the relevance of various country-specific variables in the selection of foreign markets. Previous literature had indicated that market size and growth were two country-specific variables that significantly influenced FDI decisions. However, based on these two country-specific variables, Canada and the UK received a disproportionate amount of direct investment activity from the United States. From his research, Davidson (1980) was able to confirm that market size and the presence of an existing subsidiary positively influenced investment decisions. He also noted that a firm inexperienced in investment abroad was more likely to invest in countries that were geographically and culturally similar to its home country. As the level of foreign investment experience increased, firms were more likely to base their investment decisions on "fundamental analysis of market potential, relative production and delivery costs and investment climate".

In two studies in 1983 and 1986, by the Conference Board of Canada, various country-specific variables were identified as being attractive to potential investors. They included the positive assessment of market growth, diversification into new markets, industry profitability in Canada, potential market share, technological and managerial expertise, expected profitability, and political stability. The criteria that most strongly deterred foreign investors were government regulation, foreign investment controls, influence of unions, taxation factors, and labour costs (Conference Board of Canada 1987).

Another determinant found to influence FDI location decisions was the perception that investors held of various host countries (Wee, Lim and Tan 1993). A country increases its

chances of attracting FDI if investors hold favourable images of it as a site for investment. The image that investors hold may not accurately represent reality. However, it is this image that will influence investor actions. This was demonstrated in a study conducted by Johansson and Moinpour (1977) in which they discovered a difference between subjective and objective realities of countries in the Pacific Rim. They concluded that what investors perceive is the most important factor because it is this image that will influence their actions.

Past studies have also shown that FDI decisions are affected by how companies perceive the prevailing conditions in the home country (Wee, Lim and Tan 1993). Home governments may impose regulations which increase the operating costs for a company. For instance, governments may impose environmental and health and safety regulations. A company may then decide to relocate to a country whose policies are less restrictive (Punnett and Ricks 1992).

The IMS literature has noted numerous determinants that are used by investors when deciding upon investment decisions. A place that is aware of these determinants can develop strategies to better entice investors.

2.2 WHAT IS A PLACE?

Gold and Ward (1995) define a place as "a geographical area with a specific identity that sets it apart". Great effort is taken by places to develop an identity and convey an image that is attractive to various target markets. Places seek to attract the target markets of exporters,

investors, manufacturers, corporate headquarters, tourists and conventioners, and new residents (Kotler, Haider and Rein 1993). Their ability to attract these markets will be dependent upon the identity that has been developed and the image that is conveyed.

To successfully attract various target markets, places need to position themselves in the mind of the consumer (Wells and Wint 1990; Barich and Kotler 1991; Ries and Trout 1991; Kotler, Haider and Rein 1993; Papadopoulos 1993; Wee, Lim and Tan 1993). Places have been equated to investment 'products' and "where a company will invest depends very much on the images held by its decision makers about various alternative locations" (Papadopoulos 1993, p.30). Investors, the target market of interest in this paper, represent one of the most important consumers that a place would like to attract. Policy makers must then make the effort to develop a place (the product) and convey an image that is attractive to investors (the consumer).

Other researchers view places as organizations. For instance, Graby (1993) equates countries to corporate entities whose products are the outputs of various actors including exporters, government and industry associations. The national government would represent the chief executive of the country and is responsible for implementing national objectives and policies. The image that investors hold of a country can be influenced by this government action. Wells and Wint (1990) also parallel the competition among governments for FDI to the competition that exists among firms for market share, and state that, "given the similarities in the nature of the competition, it is not surprising that countries are adopting marketing

strategies that parallel those of private companies" (p. 2). Governments are focusing on marketing mix elements in order to provide a place that will entice the investor. The numerous benefits associated with FDI compel many governments to actively market their places as ideal sites for investment.

Regardless of how researchers view a 'place', the image and the identity that is conveyed by it and interpreted by investors will determine the success of that site as an area for investment. Therefore, a place should be cognizant of the *image* investors have formed when developing strategies to attract FDI.

2.2.1 Images of Places

An *image* "represents the sum of beliefs, attitudes, and impressions that a person or group has of an object. The object may be a company, product, brand, place or person" (Barich and Kotler 1991, p. 95). Over the last thirty years a new field of research has evolved regarding the importance of place images in marketing. Country-of-origin literature has indicated that consumers develop 'stereotypical images' of countries and/or their products which affect their purchasing decisions (Graby 1993). In other words, they form a *country image*. According to Han (1989), country image can be viewed in two ways: 1) when consumers lack information about a product the image of the origin country will be used to indicate the quality of the product (referred to as the *halo effect*); 2) if products from the origin country become familiar to the consumer, country image may become a construct that summarizes

consumers' beliefs about "product attributes and directly affects their attitude toward the brand"(referred to as the *summary construct*).

The country of origin literature indicates that investors must take into account the costs associated with producing products in less developed countries. Nes and Bilkey (1993) noted "a positive relationship between product evaluations and degree of economic development of the source country" (p. 191). That is, products were perceived as more risky and of lower quality when labelled as made in less developed countries. Investors may manufacture products in a less developed country to minimize costs but they need to be aware that the consumer may use country of origin as an indicator of the quality of the product. Heslop, Liefeld and Wall (1987) noted that country of origin effects are not counterbalanced by well-known brand names or high prices. Consequently, firms need to consider the impact of country images when developing sourcing, manufacturing and marketing plans (Samiee 1994).

As noted above, a country image will affect investors' decisions. Researchers have also shown that an investor's image of regional groupings, e.g. North America and Australasia, will affect investment decisions (D'Souza 1993; Wee, Lim and Tan 1993; Kalligatsi 1996). That is to say, this image will be conveyed upon member countries. Consequently, it is important for countries belonging to regional groupings to determine their individual image and their image as a member of their regional group. D'Souza (1993) set out to determine foreign investors' perceptions of the Canadian investment climate. From this study, one of the

conclusions she made was that investors perceived Canada as a member of the North America region, rather than as a separate country for investment. Wee, Lim and Tan (1993) also noted the importance of determining the image of Singapore and the images investors had formed of ASEAN. From their study, the researchers were able to determine that investors associated Singapore with other newly industrialized Asian countries rather than as a member of ASEAN. These two studies demonstrate how the image of various regional groupings can influence investment decisions.

Overall, country of origin literature has indicated how important a determinant a place's image is to the investment decision process. Consequently, to entice investors, a place will need to convey an attractive image.

2.2.2 Marketing Places

As noted in the country of origin literature, a place's image is a critical determinant of the way investors respond to a place. Barich and Kotler (1991) argue the benefits of an image tracking and management system, that is, of systematically determining what image a place holds in the minds of its consumers. The main advantages to determining this image are that it enables a place to: 1) detect unfavourable image shifts early and act immediately; 2) identify key areas where its performance lags behind its competitors and work to strengthen those areas; 3) capitalize on those areas where it outshines its competitors by stressing and building upon those strengths; 4) learn whether its corrective actions have been effective in improving its image.

It is crucial that a place project itself as an ideal location for FDI to ensure continued economic vitality. It can only succeed in doing this if it knows how investors perceive it. If it is in a positive light, then promotional techniques should continue to emphasize this. If it is perceived in a negative way, corrective steps need to be implemented so that investors change their opinion (Barich and Kotler 1991; Graby 1993; Kotler, Haider and Rein 1993; Morello 1993). "The challenge facing marketers is to ascertain the images foreign consumers hold about them...and armed with this knowledge, decide whether any relevant action is indicated."(Papadopoulos 1993, p. 24)

At the national level, many countries attempt to market themselves as locations for investment. The degree of success experienced by these countries will be dependent upon how they are being perceived and clustered by investors. As noted earlier, countries that have comparatively small markets, and are members of regional groupings with strong identities, should attempt to determine their individual image and their image as a member of a regional group. Determining the image that investors hold of individual countries and of the regional group will enable policy makers to formulate marketing strategies to attract investment and to differentiate their country from the other countries/markets. Wee, Lim and Tan (1993) set out to determine how US firms viewed various countries/markets in the Asia-Pacific region; focus was placed specifically on Singapore, a newly industrialized country. One of the main objectives of their study was to gain a better understanding of how US investors positioned Singapore vis-a-vis the other Asia-Pacific countries/markets. Positioning or "perception" maps were used to address this, as they are effective at illustrating the "perceptual image" that

investors hold about various competing nations. To develop a perception map information needs to be collected regarding how investors view key attributes of a place's performance. These maps portray the way investors perceive various nations rather than the "true" distance that exists between these countries. In actuality, what investors perceive is the most important factor because it is this image that will influence their actions (Johansson and Moinpour 1977). From their study, Wee, Lim and Tan (1993) determined that Singapore was competing for a FDI pool different from other ASEAN members, e.g. Thailand, Malaysia and Indonesia. This study emphasised how important it is for a place to determine its own image and that of the regional group of which it is a member. Understanding how a place is positioned vis-a-vis its competitors will enable policy makers to develop appropriate strategies which may be needed to 'reposition' the place in the mind of the investor.

2.3 GLOBALIZATION OF MARKETS

The implementation of NAFTA and the European Union, and the liberalization of Eastern Europe, have all contributed to global interdependence. The globalization of markets has led to the reduction of national government powers, for countries have greater difficulty in implementing trade barriers to protect domestic industries and many nations willingly submit themselves to dispute resolution mechanisms (Emmerij 1992; Kresl 1992). While trade liberalization has led to the reduction of national government powers, cities have now surfaced as leading economic actors. Porter (1990) alludes to the importance of cities in the international economy. In his model of competitive advantage, two elements, *factor conditions* and *related and supported industries*, were variables in which local governments

actively played a role. Various European cities, such as Amsterdam and Hamburg, have had to respond to regional trade liberalization and Kresl (1992) concludes that cities that formulated effective strategic responses enhanced their position in the urban hierarchy. For instance, Copenhagen, with the support of its national government has asserted itself as the competitive centre of its country. This strategy has helped Copenhagen attract investment that is generally drawn to the central city of a country. Consequently, the globalization of markets has led to a greater emphasis being placed on cities, in addition to countries, to attract the necessary investment needed for economic growth and development.

The “world city” concept is an ideal or an ultimate goal that numerous urban policy makers are striving to attain for their cities. A concept first formulated by Friedmann (1986), a world city is an area that possesses a high percentage of the world's economic activity; no specific percentage has been cited. A world city possesses a desirable physical and social infrastructure, it is a locus of advanced producer services and it houses a strong financial centre (Friedmann and Wolf 1982; Johnston 1994; Shachar 1994; Knox 1996).

Soldatos (1991) has used the term 'international city' in the same vein as Friedmann. With the globalization of markets, cities have greater opportunities to develop into international actors. The two main criteria that Soldatos (1991) uses to determine the internationalism of a city are the presence of major companies and international organizations, as well as the presence of strategic services to support these organizations.

The globalization of markets has compelled cities to develop policies for the purpose of attracting foreign direct investment. Freer trade, mobile capital and freer migration have led to competition for this limited pool of capital (Wells and Wint 1990; Shachar 1994; Clarke 1995; Cox 1995; Savitch and Kantor 1995). The Giovanni Agnelli Foundation for Studies and Research (1990) argues that a strong local government is required for cities to successfully deal with the globalization of markets. They argue that the local government is responsible for guiding the city and performing the long-term strategic planning required for a place to be defined as an 'international city'.

Cox (1995) has termed the more global aspects of urban politics as *New Urban Politics*. "Cities and communities have to be situated, in terms of their respective politics of local economic development, with respect to a geographically broader economic ferment." (p.214) Cities are dependent upon investment for their economic growth, and thus investors possess a considerable amount of leverage due to their mobility. Consequently, the ability of a city to elevate its position in the urban hierarchy will be dependent upon local factors that are place bound, e.g. the infrastructure, but it will also be dependent upon the ability of local actors, e.g. local government, public and businesses to work together to attract and maintain the desired level of economic activity.

2.4 URBAN ECONOMIC DEVELOPMENT

2.4.1 Urban Political Economy

The premise underlying urban theory is that city governments promote economic growth (Friedland, Piven, Alford 1977). Molotch (1976) argues that at its very essence a city is a

growth machine. Bartik (1991) states that from the perspective of politicians and voters, the main objective of economic development is the creation of more jobs. This is supported by Beaumont and Hovey (1985) who argue that the underlying concept behind the development of local economic development strategies is that "more jobs are good and less (sic) jobs are bad."(p.328) Jobs are associated with a decrease in the level of unemployment, as well as an increase in the level of wages, property values, profits for local businesses and tax revenues. Bartik (1991) also states that the creation of jobs can also lead to the re-election of the politician who can take credit for this accomplishment. An economic development policy is likely to face a political death if it fails to increase the level of job growth. Bowman (1988) defines economic development as a "city's policy actions (promotional strategies and market interventions) aimed at creating jobs and increasing capital investment in the jurisdiction."(p.512)

Many cities have implemented policies and programs to ensure their continued economic well-being. The objectives of various cities may differ. Some cities may strive for continued growth, survival or to prevent their decline. Greater emphasis has been placed on ensuring the continued vitality of local economies. There are numerous examples of cities that have confronted 'urban fiscal crisis' (Friedland, Piven, Alford 1977). Symptoms would include the exodus of labour and/or capital and a widening gap between revenues and expenditures. For example, Standard & Poor's, the investment credit rating agency, remarked that three-quarters of 5,000 U.S. cities were confronted by a financing gap (Kotler, Haider and Rein 1993).

Savitch and Kantor (1995) note that the development strategies adopted by cities will be determined by the local context, either political or economic. They identify two types of strategies that could be adopted by cities: social progressive and growth centred strategies. Social progressive strategies are adopted by local governments who aim to balance economic growth against social enhancement. These strategies are adopted by cities that currently hold strong market positions. Cities in this position can place demands on businesses, e.g. impose a high taxation rate. These policies are commonly used by cities in “France, Denmark, Spain, Sweden and Japan (OECD, 1992)” (Savitch and Kantor 1995, p. 497). Growth centred strategies focus on attracting investment, labour and revenue to a city. These strategies are predominantly adopted by those cities that require these factors for survival, therefore, priority is placed on them.

Peterson's (1981) controversial book regarding urban development, *City Limits*, expresses a theory that is consistent with that of Molotch (1976); both researchers argue that the desire for growth motivates various agents in a community towards a consensus regarding the economic development policies it adopts. Urban actors involved in the formulation and development of economic development policies would include capital, public officials and urban residents (Fleishmann and Feagin 1987; Kotler, Haider and Rein 1993). Peterson (1981) states that there exists a unitary interest among these urban actors for growth. Urban actors reach a consensus because they are cognizant that economic growth is necessary for the vitality of their city and ultimately for their own well-being. Policies that conflict with the objective of economic growth could result in the loss of jobs, labour and tax revenues.

Peterson (1981) argues that consensus is easily reached among local actors for all parties desire economic growth, and no one actor has power over the other. In his theory on urban development, Peterson (1981) also equates a city to a business firm, because it acts like an 'efficiency maximizing organization'. There exists a unitary interest among agents in developing policies that promote economic growth because the market punishes those areas that have not successfully attracted the necessary capital (Savitch and Kantor 1995). A city that fails to implement policies that contribute to its continued economic well-being can face economic decline.

Peterson's theory on urban development has been criticized by numerous researchers. Sanders and Stone (1987) argue that the uncertainty of economic development policies creates an environment that would fail to generate a unitary interest. If decision makers are uncertain about the long-term outcomes of economic development policies, then Sanders and Stone (1987) argue that the unitary interest needed to attain utility maximization would not exist, and that urban actors are not concerned with the 'well-being' of the city, but with their own interests. They argue that Peterson's likening of a city to a business corporation is inappropriate. Stone (1984) states that "because cities have a mass citizenry and not an elite ownership, the business firm analogy ultimately breaks down"(p. 290). These researchers fault Peterson (1981) for his lack of emphasis on the political nature of the formation of economic development policies.

Although Molotch (1976) expressed views that were similar to those of Peterson (1981), his views have changed over time. In recent research, he has begun to focus upon the power plays that do occur amongst urban actors. Logan and Molotch (1987) define cities as being political entities, rather than as business corporations. The leaders within the city must form coalitions to ensure economic development. The leaders are also influenced by popular support. Recent literature has begun to emphasize how development strategies are ultimately political choices (Fainstein et al. 1983; Fleishmann and Feagin 1987; Kantor 1987; Sanders and Stone 1987; Cox 1995; Savitch and Kantor 1995). Cities are dependent upon capital for growth, however policies developed to support this segment of the economy (business) may alienate the sector (citizens) that elected public officials to office. Consequently, many politicians may adopt policies that satisfy their constituents' needs, thus ensuring their re-election in the short-term; however, these policies may not be in the best interest of the city in the long-run. Peterson (1981) also fails to acknowledge that there are both winners and losers in urban development politics (Savitch and Kantor 1995).

In his rebuttal, Peterson (1987) counters the comments made by Sanders and Stone (1987) and other critics by stating that, although conflict does exist among decision makers, they are ultimately forced by the competitive market situation to act in economically rational ways.

The argument presented by Sanders and Stone (1987) is more representative of the interactions that occur among urban actors. This is evidenced by the number of media reports expressing the conflict that exists amongst various policy makers. Although Peterson (1981)

is aware that discord exists among urban actors, it would appear that he is too optimistic in his assumption that the good of the city will prevail. A great body of literature has been written about the urban political economy because the relationships that exist among these parties influence the economic development of various localities. The numerous actors within a city (politicians, businesses, economic development agencies, etc.) may convey divergent images. The lack of agreement between the various actors will inhibit the effectiveness of an urban marketing plan, thus influencing the economic development of a city. Therefore, it is important that a city convey an image that is consistent and effective for an investor to find it credible (Ries and Trout 1991). Researchers have stressed that the image that an investor holds of a place will affect his/her behaviour (Graby 1993; Heslop and Papadopoulos 1993; Kotler, Haider and Rein 1993). Consequently, cooperation must exist among urban actors to ensure that investors do not receive divergent images of a city.

2.4.2 Competition

Cities are competing with one another to attract investment. The National Association of State Development Agencies notes that the expenditures of development agencies within the United States totalled \$1.5 billion in 1990 (Bartik 1991). The vast amount of money spent by agencies to retain and attract businesses is indicative of the fierce amount of competition that exists among cities.

Bowman (1988) defines cities as 'self-interested entities', who by their very nature exhibit a competitive behaviour. Stone (1984) states that a city that sustains a level of economic

growth will attain a better competitive position. Cities compete with one another for investment because each possesses economic interests that are place-bound and that require a healthy urban economy to survive (Cox 1995). A city that successfully attracts and/or retains businesses will have thwarted the efforts of other cities. As noted, Molotch (1976) argues that a city, at its very essence, is a growth machine. The list of core actors that make up the growth machine are: 1) the mayor of the city; 2) the business editor of the local newspaper; 3) the economic development specialist at the Chamber of Commerce and 4) the director of the economic development corporation. These actors work towards promoting the city as an area for domestic and international investment. The list of core actors identified by Molotch (1976) appears to be restrictive. For example, not all cities possess a Chamber of Commerce and many mayors lack political clout. The core actors that make up the growth machine can be restated as comprising the media, business, political and economic development leaders within each city.

Bowman (1988) surveyed the actors of the growth machine, initially identified by Molotch (1976), within 31 Southeastern cities of the U.S.. From her study, 82.1% of the respondents conclude that the economic development process is 'very competitive'. Over 83% of the local growth machine leaders felt that competition had a 'constructive effect' on the economic development of a city.

The strengths and weaknesses that a city identifies narrows the scope of FDI that it will attempt to attract. "Finite resources and the images that the leaders have of their cities and

of other cities (Strauss 1961) act to constrain the competition" (Bowman 1988, p.515). Growth machine actors are likely to perceive competition as being fierce among cities that have similar populations and similar economies. For example, not all cities will compete to hold the Olympic games. Rather, only those that possess the appropriate location characteristics and those that perceive participating cities as direct competitors are likely to compete.

Critics of economic development policies argue that competition among places creates a 'zero sum game'. That is, if one city attracts businesses to its area, another city will have lost this economic activity. As a result, according to Rubin and Zorn (1985), the nation as a whole is now no better off. These researchers fail to conceptualize the ferment of economic activity that results from the competition that exists among cities. The nation as a whole prospers because of the movement of capital that generates a greater level of economic activity. These researchers also fail to consider that trade liberalization has resulted in opportunities for cities to attract a finite amount of investment worldwide. When developing economic development strategies, cities are competing with other cities worldwide for the FDI needed for growth. Consequently, the argument that the nation as a whole is no better off is inaccurate.

Bartik (1991) presents a simplistic view as to why competition among cities for economic development improves the efficiency of a country's economy. He argues that depressed areas will aggressively pursue investment and therefore, economic activity will be redistributed to those areas that are depressed. This argument fails to express the full benefits that arise from

competition among cities and the ability of these cities to actively compete for the investment needed for economic growth and development.

Critics of economic development policies fail to understand the benefits associated with competition. As noted earlier, Bowman (1988) concluded from her study that competition had a constructive effect on the economic development of a city. A city attempting to attract investment will take great care to develop a 'product' that is attractive to investors. Consequently, competition hastens a city's effort to develop a desirable product, because the city does not want to lose investment to its competitors.

2.4.3 Urban Marketing

Although there exists disagreement in the literature regarding which urban actors (politicians, businesses, local residents) are the most influential and whether consensus is easily reached, researchers do agree that cities require effective development strategies to ensure economic growth (Peterson 1981; Sanders and Stone 1987; Savitch and Kantor 1995). Texier (1993) defines a city's attempts to generate economic development as its marketing strategy. A city conducts numerous marketing activities, such as advertising, to attract the necessary investment to its area. The marketing activities executed by cities have also been referred to as 'urban marketing'. Texier (1993), head of the research programme in Territorial Marketing at the Groupe ESC Lyon's Management Research Institute, defines urban marketing as the "promotional efforts of cities to retain attention of corporate managers, as well as other types of potential customers (the local population...) and to develop a favourable image"(1993,

p.8). In order to develop a favourable image that is attractive to investors, agreement must occur among urban actors to develop a consistent urban marketing plan. Failure to develop a unified approach may result in divergent images of a city being conveyed to investors. Lack of consistency in a city's image may confuse the investor, who may then decide to locate operations elsewhere.

2.5 DEVELOPMENT OF MARKETING MIX STRATEGIES

Numerous factors influence an organization's site location. Foreign competition, the cost of labour and the location of federal highways are examples of variables that can influence a business's location decision and over which a city has minimal if any influence. However, a city can successfully attract businesses by manipulating marketing mix elements and developing a desirable marketing strategy.

The development of a marketing plan consists of four elements: product, price, place (distribution) and promotion. The majority of the literature regarding the development of strategic marketing plans for places has failed to consider the various elements of the marketing mix. For instance, Beaumont and Hovey (1985) note only two activities that are involved in the formation of local development policies: price, often in the form of location incentives, and promotion. These two elements are manipulated extensively by policy makers when developing local policies.

Using 1982, 1986 and 1990 data from the National Association of State Development Agencies (NASDA) on economic spending, Goss and Phillips (1994) conclude that economic spending positively increased the employment growth rate. Firms are profit maximizing organizations whose goal is to obtain the greatest margin between revenues and costs. Consequently, the intent behind many industrial location incentives is to influence a firm's location decision by offering incentives that will decrease business costs. However, researchers question their effectiveness in influencing an investor's site selection. For example, Fort Wayne, Indiana, had offered a \$26.4 million incentive package to a General Motors truck assembly plant. However, Rubin and Zorn (1985) question whether the city can recoup this expense from taxes and whether these incentives affected General Motors' final location decision. The researchers noted that the local tax structure in Fort Wayne would not enable the city to raise revenues from taxation of local businesses and residents. Rubin and Zorn (1985) concluded by stating that they do not believe that industrial location incentives help to sway business location decisions in favour of the city offering the benefits.

Taxes are another form of incentive that Rubin and Zorn (1985) believe to be ineffective in influencing a firm's location selection. This argument is also supported by a study conducted by Christy and Ironside (1987) on the significance of various location factors of high-technology firms in Alberta. These researchers discovered that sixty percent of the high technology firms in the Alberta sample did not feel that provincial taxes were important in their site selection. Taxes represent a small portion of business expenses and if they are used

to provide business services and a superior infrastructure, then the place will remain desirable even if another city, with an inferior infrastructure, offers a lower tax rate.

Other researchers have argued that reducing taxes is an effective form of incentive. Bartik (1991) determined that a business tax reduction of 10 percent can lead in the long run to a 2.5 percent increase in business activity, assuming that local public services to businesses remain constant. This finding was also supported by research conducted by Phillips and Goss (1995).

Taxes, as well as other incentives, have been shown to play a significant role when used to differentiate places that could act as substitutes for one another. The role of taxes and incentives also appears to be more influential as the geographic area diminishes. Taxes do not play a significant role in a firm's choice of location among regions, but they do when it is selecting a city within a region (Rubin and Zorn 1985). "Transportation, energy, labor cost, and market differentials tend to decrease as the area under consideration diminishes, making taxes a more significant location determinant." (Rubin and Zorn 1985, p. 335)

While incentives have been used extensively to attract investors, policy makers have not placed priority on other elements of the marketing mix (product, place, promotion) which could be manipulated to effectively attract investment. The place marketer must design the right mix of features to meet the needs of its current and potential investors.

(a) Product

The *product* is one marketing mix element that policy makers should consider. Elements such as quality of life, attractions and infrastructure are used to create a product that fulfils these requirements (Kotler, Haider and Rein 1993). The city is itself the product that local governments market to investors. A highly skilled labour force is a location criterion that numerous researchers have identified as being significant in the decision making process of business organizations (Steed and DeGenova 1983; Kotler, Haider and Rein 1993). By improving the quality of its labour force, a city is improving an aspect of the product that it is trying to market. For example, the business community in Ottawa placed ads in the Montreal Gazette and the Toronto Star for the purpose of attracting highly skilled workers to the Metro Ottawa region. This action was undertaken "to avoid the kind of predatory hiring that goes on among California's Silicon Valley computer companies and (which) bids up the cost of local labour" (Report on Business 1995, p. 69). Kotler, Haider and Rein (1993) advise other actions that a city could adopt to improve its image as a site for investment. They suggest that initiatives should be implemented that would mobilize resources or remove barriers in the areas of physical and human capital, entrepreneurship, information gathering and dissemination, financial assistance, and research and technology transfer. By implementing these initiatives a city may increase the probability of successfully attracting high technology firms.

(b) Price

The price can be seen as the cost of living or investing in a place. As noted earlier, price is a marketing mix element that policy makers have extensively manipulated to attract

investment. However, a balance of incentives and costs must be created to attract and satisfy current and potential investors. The incentives offered by cities will vary. Tax abatements, low-interest loans, land write-downs, employee training programs for businesses and the development of research parks are examples of incentives offered by cities to influence a business' location decision (Beaumont and Hovey 1985; Rubin and Zorn 1985; Rubin and Rubin 1987; Leitner 1990; Kotler, Haider and Rein 1993). The variety of incentives offered by local economic development agencies will be dependent upon the economic and political environment of the city. From a study of 178 cities in Illinois, Rubin and Rubin (1987) confirm possible explanations as to why cities differ in their willingness to offer incentives for business development. The greater the level of unemployment and fiscal crisis experienced by the city, the more likely it is that city government would encourage business growth through incentives.

(c) Place (distribution)

Place (distribution) is another marketing mix element that should be considered. Channels of distribution are "sets of interdependent organizations involved in the process of making a product or service available for use or consumption" (Semenih, Bamossy and Vaughan 1995, p.444). Economic development agencies and/or Chambers of Commerce are examples of organizations within most cities that are responsible for the distribution element in the marketing mix. These organizations bring the *product* to the investors. That is, they provide the investors with access to the product/place (Heslop 1996). "When location is not a factor that can be changed or expanded, it is difficult, although not impossible, to strategically

enhance the delivery system to accord the time, place, and possession utilities that distribution often can provide buyers" (Semenih, Bamossy and Vaughan 1995, p.641). The Ottawa Carleton Economic Development Corporation (OCEDCO) is an example of an organization that provides access to a place. For example, a business relationship was formed between a Hong Kong based company and the Electrochemical Institute of the University of Ottawa, when OCEDCO supplied relevant information about the local institute to the foreign company (OCEDCO Annual Report 1994). Trade counsellors in embassies and consular offices also provide access to a place. Many of these organizations participate in promotional activities that provide information to potential investors.

(d) Promotion

A city may possess desirable characteristics to investors and provide appropriate incentives. However, if investors are unaware of these attributes, it will fail to attract the desired investment. Cities are participating in extensive promotional activities to attract economic activity and to ensure their economic growth. Well and Wint (1990) identify promotional activities designed to accomplish three different objectives: 1) image-building, 2) investment generation and 3) investment services. To achieve these various objectives different types of promotional techniques could be used by cities. They would include advertising in trade papers, investment missions, direct mailing, participation in trade shows, industrial prospecting trips, etc.

Previously, cities focused primarily on one aspect of the marketing mix - incentives. However, Bartik (1991) notes an increase in 'new wave' economic development policies which have also placed greater emphasis on the promotion aspect of the marketing mix (See Appendix A). The failure of many researchers to focus on the complete set of marketing elements demonstrates a lack of complete understanding of the term 'marketing'. Kotler, Haider and Rein (1993) have, however, noted a decline in the use of incentives by cities during the 1990's. Politicians are now placing more emphasis on ameliorating the city (the product) that they are trying to market. This would include emphasis on improving the infrastructure, the quality of life and the school systems, as means of attracting the necessary investment.

2.6 LOCATION THEORY

Many cities are interested in attracting high technology industries for there exists a perception that this is a 'clean' industry which generates large employment impacts from the diffusion of its products by other industries [Joint Economic Congress of the United States (1982)]. Cities which have experienced serious economic decline assume that high technology will create for them an industrial renaissance that is similar to what has occurred along Boston's Route 128. Between 1968 and 1978 the Greater Boston area had lost over 250,000 manufacturing jobs and the city faced economic decline. However, the establishment of Digital Equipment and other similar organizations in the region has enabled it to prosper. Between 1975 and 1980 over 225,000 manufacturing jobs, mostly in high technology industries, were created (National Research Council Canada 1996). The greatest success has

been achieved at California's Silicon Valley where more than 3,650 firms have emerged, employing over 300,000 people (San Jose Mercury News 1995; National Research Council Canada 1996). The success achieved at Silicon Valley has been referred to as the 'Holy Grail' and many places seek to emulate this achievement.

Industrial geographers have noted that industrial countries that succeed in attaining high levels of knowledge or education will be able to attract the technologically advanced industries needed to attain a competitive advantage (Steed and DeGenova 1983; Hall and Markusen 1985; Rees and Stafford 1986). "The theory of *technological competence* implies that MNEs will locate research facilities linked to the more sophisticated types of research-related production in countries with similar fields of competence"(Cantwell 1991, p. 53). Therefore, places that seek to attract technologically advanced industries will need to develop the determinants that are desirable to this target market in order to gain a competitive advantage.

To attract businesses and foreign investment, a city needs to understand the location factors considered by firms when deciding upon a site. Traditional location theory, first proposed by Weber (1929), states that factors of production are used by firms when deciding the importance of a site. A firm will choose a site where materials, labour supplies, potential markets and agglomeration effects ["the effects that accrue to firms from close proximity to others engaged in related activities" (Herbig and Golden 1993, p.47)] are ideal. In addition, manufacturing firms will try to minimize the transportation costs between their suppliers and consumers (Waters 1984; Markusen, Hall and Glasmeier, 1986; Watts 1987). Although this

theory is still pertinent to many manufacturing firms, newer research has superseded it in regards to high technology firms. For instance, firms in high technology sectors typically do not incur high transportation costs in getting products to market and these costs do not strongly influence price. However, accessing markets for market research, product development collaboration, and personal selling and promotion are highly critical (Christy and Ironside 1987).

Glasmeier (1991) identified four characteristics that places possessed which enabled high-technology firms to prosper. They included the existence of business support services, substantial defence spending, the presence of a technical workforce, and access to universities. These factors were found to be statistically significant by Markusen, Hall and Glasmeier (1986) in their evaluation of the formation of high technology areas during the mid-1970's. These four characteristics have also been identified by Herbig and Golden (1993) as having contributed to the formation and ultimate success of California's Silicon Valley and Boston's Route 128. Other variables that were identified as having contributed to the success of these areas included the presence of venture capitalists, a superior infrastructure, initial low development costs, and the presence of a leading entrepreneur or firm. Although some of these location characteristics are specific to the United States, e.g. the amount of defence spending, many of these variables still seem reasonable and applicable to other areas.

The Joint Economic Congress Survey (1982) also found the above elements to be important in their survey of the factors contributing to the success of the Research Triangle Park in

North Carolina. However, in that survey the tax climate, and labour and transportation costs were given a higher ranking.

A strong research university was noted as having been key to high technology growth along Route 128 and in Silicon Valley. However, Markusen, Hall and Glasmeier (1986) noted that the universities, MIT and Stanford, had the required research strengths in electronic engineering at the time when defence spending was concentrated in this area. "Universities that developed the appropriate programs later, like most of the big midwestern centers, then simply found that they were exporting their graduates to the high tech cores" (p. 177). Therefore, the presence of a university is not a location variable that on its own will ensure high technology growth. Rather, the research conducted by a university at various points in time will determine a place's success at attracting investment. Steed and DeGenova (1983) also found that the presence of a university was not a location variable that on its own ensured high technology growth. These researchers noted that the presence of two universities, Ottawa and Carleton University, were not an important location characteristic to the formation of 'Silicon Valley North' in the Ottawa-Carleton region. Instead, the presence of federal government research agencies and private laboratories were found to have had a more significant effect. Along similar lines, in a study conducted by Christy and Ironside (1987), 40 percent of the 116 high technology firms in Alberta felt close proximity to a university to be unimportant. Only 21 percent considered proximity to a university to be important or very important.

A survey of 99 high technology firms by the United States Office of Technology Assessment ranked the home of the founding entrepreneur as having the greatest importance (Kolz 1984; Christy and Ironside 1987). In the study conducted by Steed and DeGenova (1983), 41 out of 45 firms that located in the Ottawa-Carleton region were founded by entrepreneurs who had strong local associations. In their survey of 33 high technology firms in the CTT, Bathelt and Hecht (1990) found that proximity to the place of education/birth/residence of the founder was the second most frequently cited location decision factor. "For these new firms, a site close to the founder's residence and/or the incubator organization is a natural location because it enables the founder to maintain well-known information channels after the start-up decision" (Bathelt and Hecht 1990, p. 228). This location decision factor is relevant to new firm founders; however, it becomes less relevant as a firm grows and expands to other locations.

High technology firms were also drawn to areas that were considered desirable to their highly skilled labour force (Bednarz's Texas Locational Survey 1984; Dorfman 1988). Malecki (1984) noted that access to recreational and cultural amenities was essential to attract and retain the highly skilled labour force of high technology industries (Christy and Ironside 1987). Kotler, Haider and Rein (1993) also noted that the quality of life and community attractiveness were variables considered by high technology firms when considering the location of investments.

Factors found not to be important to high technology industries included unionization, wage rates and the presence of a strong research component, or in other words the presence of a university (Markusen, Hall and Glasmeier 1986). In their survey of 116 high technology firms in Alberta, Christy and Ironside (1987) found that sixty percent of the firms did not feel that provincial taxes were important in their site selection. Therefore, taxes did not prove to be a significant factor. Low availability of skilled labour, high housing costs and large distances from customers were negative location factors that a high proportion of firms cited in the study conducted by Bathelt and Hecht (1990) in the CTT.

Although labour skills are ranked highly by the high technology firms in a variety of surveys, there is no consistency in the ordering by importance of these location variables (See Appendix B for greater detail on studies that were conducted to determine the importance of various location criteria to high technology companies). Researchers have chosen different high technology sectors and different cities in their studies. This has resulted in a fragmented conception of which variables are the most important to high technology firms. Areas seeking to emulate such success stories as Boston's Route 128 and California's Silicon Valley, require a better understanding as to which location variables are the most important, such that appropriate developmental policies can be implemented.

Although the studies by Rolfe et al. (1993) and Wee, Lim and Tan (1993) were conducted at the national level the concepts can be brought to the local level. Both studies emphasized the importance of understanding the needs of current and potential investors prior to the

development of marketing plans. Consequently, cities striving to emulate the success that was achieved at Palo Alto will need to understand the needs of high technology firms and the image that these firms hold. Appropriate marketing strategies can then be developed that will attract firms to set up operations in that city.

2.7 CONCLUSIONS FROM THE LITERATURE

Multinational corporations (MNC) bring to a city numerous benefits, e.g., capital, technology, management expertise, employment, etc.. These factors stimulate the economic development of a city. Therefore, the competition among cities for this investment is fierce. Companies are mobile and are thus able to relocate to cities that best satisfy their location requirements. “Businesses are footloose, more capable than ever of adjusting to changes in their environment, far more than are places” (Kotler, Haider and Rein 1993, p.12). Cities, which are place bound, must then market themselves as desirable areas for investment. Country of origin literature has noted that companies form images of places regarding their potential as areas for investment. Therefore, policy makers seeking to attract investors will need to convey an image that investors perceive as being attractive. The literature regarding urban theory has emphasized the conflict that exists among local urban actors (Sanders and Stone 1987). Failure to convey a consistent image will deter investors. Therefore, urban actors must unite to ensure that divergent images are not imparted. To successfully attract investment, policy makers need to be aware of the image that is conveyed of their city and undertake corrective steps when needed. Therefore, an image tracking and management system should be implemented (Kotler and Barich 1991).

The literature has also emphasized the pursuit of high technology companies by cities. Many manufacturing companies have relocated to other countries with lower wage rates. The exodus of manufacturing jobs has resulted in the demise of many old industrial cities such as Flint, Michigan. Consequently, many cities envy the success that has been achieved in Silicon

Valley and are currently implementing steps to attain a similar success. To attract high technology companies it is important to determine which location variables these companies consider when selecting a site for operations. The location criteria most often cited in the studies included labour skills, cost of living, venture capital availability, access to markets, etc. (Glasmeier et al Survey 1982; Joint Economic Congress Survey 1982; Steed and DeGenova 1983). Places seeking to attract high technology firms will need to develop many of the criteria that these firms found desirable. In other words, policy makers will need to ameliorate the city/product if it lacks those characteristics that would make it an ideal site for investment by high technology companies..

Research has been conducted, in the country of origin literature, regarding the images that companies form of countries concerning their potential as locations for investment (D'Souza 1993; Papadopoulos and Heslop 1993; Wee, Lim and Tan 1993; Kalligatsi 1996). However, little if any research has been conducted regarding the images that companies form of cities or regions concerning their potential as locations for investment. This research seeks to address this gap in the literature by determining the image of five North American technology centres from the viewpoint of investors. Monitoring a city's image is necessary to develop appropriate strategies. A city that projects a positive image will increase its probability of attracting high levels of economic activity. The information gathered from this research will provide the five cities/regions in this study with the information that is necessary to develop strategies that are effective in attracting high technology companies.

3. RESEARCH OBJECTIVES

This research sought to advance understanding of how a city's image is related to, and may influence, its ability to attract investment. Little research has been conducted regarding the images that investors form of cities. However, greater effort has been taken by cities to market themselves as sites for investment. The overall goal of this study was expressed in four specific objectives:

- a. Identifying location objectives and the importance of location characteristics that high technology companies consider in their selection of investment sites;
- b. Examining how investors rate the various cities based on criteria considered important;
- c. Identifying how investors position the five cities in relation to one another as sites for investment;
- d. Identifying the importance of information sources considered by high technology companies when choosing among alternative locations for investment.

4. RESEARCH METHODOLOGY

4.1 GENERAL OVERVIEW

Initial financial restraints limited the scope of this study to the examination of five technology intensive regions: Ottawa, Guelph-Cambridge-Kitchener/Waterloo (CTT), Raleigh, Boston and Palo Alto. However, two national overlay samples were also added as part of the larger IBSG study mentioned above. In other words, the top 200 Canadian and American firms in the telecommunications, computer hardware and computer software sectors were also surveyed. This section includes a discussion on the research design, sampling process used and the data analysis procedures.

4.2 RESEARCH DESIGN

The research design was a descriptive research survey.

4.3 SAMPLING PROCESS

4.3.1 Sample population and size

The study surveyed technology executives in the five technology intensive regions that were originally selected for this study plus the top 200 telecommunications, computer hardware and computer software companies in each of Canada and the United States. The lists regarding the top high technology companies were based on a company's total worldwide revenues. If a company had already been included in a regional frame, the next company with the highest worldwide revenues would be selected for the national overlay frame.

4.3.1.1 Five region study

The population consisted of high technology firms from the telecommunications and computer hardware and software sectors. These industries were chosen because one of the main objectives of this study was to investigate the image of the Ottawa-Carleton region, where these three industries represent over half of the advanced technology companies (OCEDCO 1995). The other regions in this study were also selected because of their high concentration in these three industries.

The sample firms were selected from five North American high technology centres. The number of sites was determined by the need to ask respondents to compare the Ottawa-Carleton region to as many other sites as possible that compete for technology. Selecting more than five regions would have resulted in an excessively long questionnaire. The design of the study enabled the respondents at each site to evaluate all regions in the study, so that their own region could be used as a benchmark in each case for assessing the other four.

As noted, the first site selected was Ottawa-Carleton, which is the region of primary interest in this study and is often referred to as Silicon Valley North. CTT was then chosen because of its proximity to Ottawa-Carleton. The city of London was also included to the mailout when the sample size for the CTT area proved to be too small. Two major high technology centres in the eastern United States were also selected, Raleigh (North Carolina) and Boston's Route 128 (Massachusetts). The final site selected was Palo Alto (California), as the largest and most recognized high technology centre in the world. The concentration of high

technology companies in these regions is high (more than 350 firms in CTT, 700 in Ottawa-Carleton, 1,000 in Raleigh and surrounding cities, 2,000 along Boston's Route 128, and 3,000 in Palo Alto's Silicon Valley). [Bathelt and Hecht 1990; San Jose Mercury News 1995; National Research Council 1996; OCEDCO 1996; Elstrom, et al. 1997]

Initially, the aim of this study was to select medium and large sized high technology companies, in order to obtain responses from companies that were likely to have international exposure, a greater familiarity with the regions in the study, and a greater likelihood of being in a position to invest beyond their headquarters region. Researchers have used both number of employees and sales level of a firm as a measurement of size (Sheridan 1988; Calof 1994) but differ in the cutoff points used to distinguish among various size levels. Beamish and Munro (1986) considered medium-sized firms to have between \$2 million and \$25 million in sales, Kaynak and Kothari (1984) considered small and medium sized firms as having less than 250 employees, and Calof (1994) identified medium sized firms as those with more than \$10 million in sales and/or 50 employees. In this study, Calof's (1994) definition was used as a starting point. However, the cutoff points were lowered to ensure that a sample size of 150 companies could be obtained for four of the five regions. In order to obtain the appropriate target population of interest for the Ottawa-Carleton region, all companies with 25 or more employees were selected. This cut-off point was also used for the Boston and Palo Alto region. The directories obtained for the Raleigh region did not provide information regarding company size and consequently all companies that were in the appropriate technology sectors were included to obtain the right population size. Likewise, given that the CTT/London region had a small population of companies in the telecommunications,

computer hardware and software industries the whole population was surveyed. Given the new cutoff points the following target population sizes resulted: Ottawa - 157, CTT - 100, Boston - 154, and Raleigh - 153. A total of 465 companies was identified for Palo Alto, however this was too large a population to survey. Consequently, every third company was systematically selected to ensure a sample size of 155 companies (See Appendix C).

4.3.1.2 Canadian and American overlay sample

As noted earlier, the top two hundred firms in the telecommunications, computer hardware and computer software companies from Canada and the United States were added to the sample. Obtaining responses from companies located in other areas in Canada and United States would provide a better assessment of the five regions under examination in this study.

4.3.2 Sampling Frame

Various sources were used to develop lists for each region and for the two national overlay samples. Appendix C details how the directories were obtained and which were used in the formulation of the various lists. Great care and effort was taken to develop recent and representative lists.

4.3.3 Sampling Unit

The sampling unit was high technology companies located in Ottawa, CTT, Boston, Raleigh, and Palo Alto, and in other places throughout the United States and Canada through the overlay samples.

4.3.4 Sampling Element

The sampling element was the CEO or president of each company who was requested to complete the questionnaire or to designate this responsibility to the most senior executive responsible for investment decisions.

4.4 RESEARCH INSTRUMENT/DATA COLLECTION

Great effort was taken to follow the “total design method” that Dillman (1977) recommends in the development of a research instrument. For example, each of the letters (pre-notification, original questionnaire mailout, follow-up questionnaire mailout) sent to the respondents were personalized. Dillman (1977) noted that the personalization of the letter made the “respondent feel that they are accorded individual attention” (p. 163).

The data was collected through self-administered questionnaires. It is important to note, that throughout the questionnaire the regions of interest were identified as: Ottawa, Guelph-Cambridge-Kitchener/Waterloo, Raleigh-Durham-Chapel Hill, Route 128 and Palo Alto. No other information was provided about the regions. For instance, Palo Alto was not referred to as “Silicon Valley”, and no reference was made to the other cities that form this high technology region. The questionnaire is comprised of eight sections (See Appendix P). Section 1 consisted of 17 items designed to measure the importance of investment objectives. Many of the items were obtained from the literature (Davidson 1980; Wee, Lim and Tan 1993) as well as from a previous study conducted by Kalligatsi (1996).

Thirty items were used in the second section to determine the importance of location variables using a 5-point scale. From the literature (Appendix B) 40 location variables were found to have significantly influenced the investment decision making process. These were reduced to 30 after examining the variables and their relevance to the high technology sector and also based on the findings from earlier country of origin and other studies. For example, earlier studies have shown that manufacturing firms will try to minimize the transportation costs between their suppliers and consumers (Weber 1929; Waters 1984; Markusen, Hall and Glasmeier 1986; Herbig and Golden 1993). However, current high technology location theory has indicated that transportation costs are not a significant location issue for companies in this sector, and therefore this variable was not included in this study.

Section 3 asked the respondents to rate the importance of 20 information sources in considering investment locations using a 5-point scale. The information sources were limited to those that were applicable to companies investing within North America. To ensure that no relevant sources would be omitted, respondents were provided with the option of including an additional source(s). The researcher's own experience with compiling data on the investment potential of various high technology regions was used to include any information sources that were not included in previous research studies. For instance, the recent popularity of the Internet has made it a widely used medium for information.

Section 4 examined the investment climate of the various technology centres. Profiles of the five regions were obtained by using semantic differential scales. This technique

produces an efficient way to secure attitudes from a large sample. "The total set of responses provides a comprehensive picture of the meaning of an object, and also a measure of the subject doing the rating" (Cooper and Emory 1995, p.187). Each region was assessed through a 30 item scale which was identical to the scale used to measure the importance of location variables in Section 2. In addition, two other variables were included to determine the overall investment climate of each region. To broaden the scope of the comparison and enable it to reflect more closely the range of regions which may be in the respondents' evoked set, in the questionnaire they were encouraged to specify and assess an additional region beyond the five already included in the study

Section 5 sought to determine the competitive positioning of the five regions and the respective countries in which they are located, using similarity-dissimilarity judgements in order to portray the regions on a perceptual map. This part of the questionnaire was included to satisfy other objectives of the larger study and therefore, it will not be discussed in this report.

Section 6 examined the respondents overall knowledge about the regions using open-ended questions. For instance, the respondents were asked to list three or four high technology companies that have headquarters in each of the regions. Section 7 of the questionnaire asked respondents to provide basic demographic information. The final section of the questionnaire enabled the respondents to provide any relevant comments they might wish to add.

A personalized pre-notification letter was sent to the respondents (See Appendix O), followed three days later by the initial questionnaire mailout. A follow-up questionnaire was mailed three weeks later accompanied by a reminder letter (See Appendix O). To improve the initial low response rate, telephone calls were made to all the respondents except the Canadian overlay sample. This group was not telephoned because the response rate was appropriate and budget and time constraints made it necessary to put available resources to better use by focusing on the American sample. Faxed questionnaires were also sent to those respondents who had not yet received the questionnaire at the time of follow-up phone calls and who expressed an interest in completing the survey.

4.5 DATA ANALYSIS

Frequencies and means were used to determine the importance of location factors, objectives for investments and sources of information used. The overall mean scores were calculated for the five cities/regions in the study to determine their perceived importance as markets for investment. Multivariate repeated measures was also used because the experimental unit is measured on several different occasions and this procedure removes the variability due to individual differences in the error term (Stevens 1992).

5. RESULTS AND ANALYSIS:

5.1 SURVEY RESPONSE

Overall, 1119 questionnaires were mailed to the five regions. As noted in Appendix C, the London region was included as part of the CTT in order to increase the overall population size. A number of respondents could not be located, either because the company had moved and the questionnaire was undeliverable, or that person was no longer an employee within that company. Consequently, the population/sample size for each region has been reduced because of respondents that could not be reached. The resulting sample sizes for each region, after removing undeliverable questionnaires, are listed below:

Region	Initial population/ sample size	Undeliverable questionnaires	Number in sample after eliminating non-deliverable questionnaires	Returned Questionnaires	Response Rate (%)
Ottawa	157	31	126	41	32.5
CTT/London	100	29	71	28	33.7
Boston	154	29	125	16	12.8
Palo Alto	155	36	119	16	13.4
Raleigh	153	46	107	19	17.8
Top 200 Canadian	200	37	163	31	19.0
Top 200 American	200	38	162	12	7.5
<i>Total</i>	1119	246	873	164	18.8

The overall response rate for this survey is 18.8%. This rate is significantly lower than what Dillman (1977: p. 51) suggested for mail surveys that followed the total design method (TDM). However, response rates of 74% which is the median response for surveys using

TDM, seem disproportionately high for the sample element in this study. Various studies would indicate that there is a lower response rate for mail surveys to industrial populations than to household populations (Jobber and Sanderson 1985; London and Dommeyer 1990). The power of direct appeal is greatly diminished when a survey is sent to the CEO or president of a company, because they are generally screened by the assistant/secretary (gatekeepers) who may simply decide to discard it rather than forward it. Many of the assistants/secretaries that were contacted during the follow-up telephone calls informed the researcher that the respondent does not complete questionnaires and consequently, the survey was not forwarded.

As noted earlier, many studies would indicate that industrial populations have a low response rate. A university-sponsored study of 440 senior marketing executives of large manufacturing companies, had an overall response rate of 18.3% (Jobber and Sanderson 1985). Chawla, Balakrishnan and Smith (1992) conducted a university-sponsored survey of dealers of medical equipment. A five page questionnaire was sent to two hundred dealers with a response rate of 19.75%. In a survey conducted by Dickson and MacLachlan (1996), where the sampling element was the CEO of Fortune 500 companies, the researchers observed a 32 percent response rate. However, the length of the questionnaire was not mentioned and this factor may have significantly affected the response rate in this study. Dillman (1977) indicates that a survey in excess of 11 pages will have an adverse effect on response rates. Overall, the response rates, noted by Dillman (1977), from studies that occurred during the sixties and seventies may be overly optimistic for today and especially for industrial populations.

Three other factors noted by London and Dommeyer (1990) which may explain the low response rates from industrial populations are: 1) respondents who receive a questionnaire at their place of work may be too busy with their own tasks to complete the survey; 2) many industrial populations are hesitant about participating in a survey for fear of disclosing confidential information and; 3) many companies have implemented policies that prohibit employee participation in surveys. During the follow-up telephone calls, the researcher noted that a large number of companies had implemented policies against participation in surveys due to the large influx of surveys that were being received. One company even stated that “they could hire someone full-time to complete all the surveys that they received”.

In addition to generally lower response rates in industrial surveys, which commonly do not exceed 20%, high technology companies are of high and current interest among researchers and this factor may also have contributed to this study’s response rate. Overall, the response rate is considered well within the range of similar studies, and, given the initial population, the absolute number of respondents (164) is higher than in most comparable studies.

5.2 OVERALL DEMOGRAPHICS

This section presents demographic information about the respondents and their companies. The findings indicate that the appropriate population was targeted. Information was obtained from companies in the telecommunication, computer hardware and computer software sectors. Information was also obtained for different company sizes. The appropriate sampling element was also reached.

The sample breakdown by company size and sector, presented in Table 5.1, indicate that the survey obtained a good representation of the intended population. It should be noted that, although 48.5% of the sample indicated that their primary business was computer software, many companies fall into more than one category. For instance, a respondent mentioned that their primary business is wireless communication, which would classify the company in the telecommunications sector, however, this company produces hardware and software. The headquarter/subsidiary split also indicates that the survey reached the intended population. Given their importance, the company size, type of company, and sector breakdowns will be used below where appropriate in analysing the main findings.

Table 5.1 - Company Information

	<i>Frequency</i>	<i>Percent</i>
<i>Type of company</i>		
computer software	80	48.5
computer hardware	35	21.2
telecommunications	36	21.8
missing value	13	7.9
Total	<u>164</u>	<u>100</u>
<i>Headquarters/Subsidiary</i>		
headquarters	136	82.4
subsidiary	25	15.2
missing value	3	1.8
Total	<u>164</u>	<u>100</u>
<i>Size of company</i>		
less than \$ 10 million	54	36.7
\$10-\$50 million	45	30.6
over \$50 million	48	32.7
<i>Number of employees</i>		
less than 50 employees	56	39.2
50-500 employees	43	30.1
over 500 employees	44	30.8

Table 5.2 reveals that the majority of the respondents were male, thirty years of age or older, and presidents or other senior executives responsible for investment decisions. The

respondents' educational background (engineering/science vs other) was varied and, since it may influence the ratings of location criteria, will be used where appropriate to analyse the data.

Table 5.2 - Respondent Demographics

	<i>Frequency</i>	<i>Percent</i>
<i>Gender</i>		
Male	135	81.8
Female	19	11.5
Missing value	10	6.1
<i>Age Group</i>		
29 or less	5	3.0
30-44	77	46.7
45 or more	78	47.3
Missing value	4	2.4
<i>Highest level of education</i>		
High school education	2	1.3
College education	19	12.0
Bachelor:	70	44.3
-business (36%)		
-engineering (24%)		
-computer science (10%)		
-economics (8%)		
-math (4%)		
-chemistry/physics (4%)		
-other (14%)		
Master's or higher:	67	42.4
-MBA (50%)		
-Engineering (23.2%)		
-Computer Science (5.4%)		
-Accounting (3.6%)		
-Economics (1.8%)		
-Public Administration (1.8%)		
-Math (1.8%)		
-Other (4.2%)		
Missing value	6	-

Table 5.2 - Respondent Demographics (cont'd)

<i>Title of respondent:</i>	<i>Frequency</i>	<i>Percent</i>
President	60	36.6
Vice President	30	18.3
Manager - General, Division	19	11.5
Director of Business Development	18	11.0
CEO	17	10.4
Controller	8	4.9
Partner	4	2.4
COO	3	1.8
Treasurer	2	1.2
Public Relations	2	1.2
Other	1	0.6
Total	164	100

Table 5.3a reveals that 78.8% of the respondents had total or major degree of responsibility for investment decisions in their company. The degree of responsibility that a respondent holds within a company will be used where appropriate in analysing the main findings.

Table 5.3 - Respondent Responsibility

a) Respondent's degree of responsibility (n=164):

<i>Responsibility</i>	<i>Frequency</i>	<i>Percent</i>
Total	26	16.3
Major	100	62.5
Minor	24	15.0
No responsibility	10	6.3
Missing Values	4	-

Table 5.3 - Respondent Responsibility (*cont'd*)

b) Role respondent plays in investment decisions for their company (n=164)

<i>Investment Role</i>	<i>Frequency</i>	<i>Percent</i>
Initiate decision process	109	67.7
Collecting/analysing information	95	59.0
Scouting locations	61	37.9
Choosing location	79	49.1
Implementing decision	80	50.0
Making final decision to invest	86	53.4

Table 5.3b reveals the role respondents play in investment decisions for their company. A large percentage of the respondents were involved in initiating the decision process, making the final decision to invest, and in the collecting/analysing of information.

5.3 IMPORTANCE OF INVESTMENT OBJECTIVES

This section of the questionnaire was devoted to assessing the importance of various objectives when high technology firms consider a new investment in North America beyond the region(s) in which they currently operate. The investment objectives with the highest means will be considered first, and further analysis will then be conducted to determine whether Canadian firms differ from American firms in the importance they attribute to these objectives. Differences in the importance ratings of various objectives by company size will also be discussed.

Table 5.4 displays the mean ratings of objectives as reported by all the respondents. Factor analysis was performed in order to understand the underlying factors relating to the 17 investment objectives. The ratings that each variable received by the respondents went into the factor analysis. Varimax rotation was used and five factors were extracted. Only statements with loadings of at least 0.5 were included in the factors. The grouping of the statements for each factor was interpreted as: Government objectives (factor 1), Market objectives (factor 2), Country Presence objectives (factor 3), Labour/Production Costs objectives (factor 4) and Risk Hedging objectives (factor 5). The variable means and loadings are presented in Table 5.4. As well, the variance that each factor accounts for is also displayed in this table. The first factor, Government, accounted for 37.6% of the variance. However, none of the variables in this factor obtained mean ratings equal to or exceeding 3. Respondents did not consider variables such as overcoming inter-state or inter-provincial trade barriers, or benefitting from local government incentives, as primary investment objectives. The low mean ratings of these variables, coupled with the high proportion of the variance that they explain, suggest that executives see these more as “necessary conditions” than as “proactive objectives” for investing. The Market factor also accounted for a significant percent of the variance, followed by Country Presence, Labour/Production Costs and Risk Hedging. Overall, the five factors combined explained 82% of the total variance. Although factor 5 - Risk Hedging accounted for a small amount of variance (4.5%), it appears to be significant with a strong loading for ‘to locate in a better climate for investment & business’.

Table 5.4 - Mean Ratings for the Importance of Investment Objectives
n=164

Objectives	Mean	Factor Loadings
to benefit from federal govt incentives	2.7	.72
to benefit from state or provincial incentives	2.8	.87
to overcome inter-state or inter-provincial trade barriers	2.4	.61
to benefit from local govt incentives	<u>2.6</u>	<u>.88</u>
Factor 1: Government	2.6	37.6%*
to get closer to existing or potential customers	4.0	.54
to get closer to major new markets	3.9	.73
to protect existing markets	3.0	.86
to get closer to major suppliers	2.6	.62
to follow competitors who have invested there	<u>2.2</u>	<u>.81</u>
Factor 2: Market	3.1	19.7%*
to establish a presence in the US (Cdn respondents)	3.7	.60
to establish a presence in Canada (US respondents)	2.7	.93
to meet govt requirements	2.7	.68
to overcome national trade barriers	<u>2.8</u>	<u>.76</u>
Factor 3: Country presence	3.0	11.0%*
to access special design, engineering, & other skills	3.5	.73
to benefit from lower labour costs or higher productivity	3.0	.78
to lower production costs	<u>2.8</u>	<u>.78</u>
Factor 4: Labour/production costs	3.1	7.4%*
to locate in a better climate for investment & business	3.2	.90
to benefit or guard against currency fluctuations	<u>2.3</u>	<u>.62</u>
Factor 5: Risk hedging	2.8	6.3%*

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1= not important at all to 5= very important

The factors are based on the analysis for the whole sample, n=164.

* = %of variance accounted for by the factor

The highest rated objective is market related. Respondents considered 'getting closer to existing or potential customers' the main motive that drives decisions to expand. This was closely followed by two other market related objectives: to get closer to major new markets and to protect the existing market, and, the overall score for the second factor, which contains

the market variables, was the highest-rated in a tie with Production cost considerations with a mean of 3.1. However, respondents considered one Market variable, 'to follow competitors who have invested there', to be the least important investment objective.

'To establish a presence in the US' received a high rating by Canadian respondents. The importance of this objective to Canadians supports the other market related objectives that received a high rating. Given the size of the American market it is apparent that Canadians are motivated to invest in this major market where there is the presence of existing or potential customers. Americans did not give as high a rating to establishing a presence in Canada. However, this can be explained by Canada's smaller market.

Accessing special design, engineering and other skills also received a high rating. This objective would support the importance of a highly skilled workforce to high technology companies (Steed and DeGenova 1983; Hall and Markusen 1985; Rees and Stafford 1986). Benefiting from lower labour costs or higher productivity is another investment objective that received a rating equal to or above the midpoint of the scale. However, benefitting from lower labour or production costs was an investment objective that Americans considered more important than Canadian respondents. The questionnaire findings would suggest that meeting Government Requirements and/or Market and Labour/Production Costs factors are the most important objectives for high technology companies when considering a new investment in North America. The Country Presence factor had the third highest mean score but explains

a lower proportion of the variance and includes variables that are related to either the Market or the Government factors.

Overall, these findings support traditional location theory which states that firms will choose a site where materials, labour supplies, potential markets and agglomeration effects are ideal.

For a better understanding of the importance of the different objectives, further analysis of the questionnaire responses was conducted. Table 5.5 displays the mean ratings of each objective for Canadian and American companies. Multivariate tests of significance (MANOVA) were performed and it was found that the responses of Canadians and Americans are not significantly different at the 0.05 level. Results are presented in Appendix D. Given that the multivariate tests of significance may lack power, the individual univariate tests were also considered at a Bonferroni level of $0.15/17=0.009$ (Stevens 1992: p.198). These tests were examined, to ensure that no interesting observation was hidden due to any lack of power. However, Appendix D reveals that Canadian and American responses were not significantly different.

To determine whether company size is related to the importance of investment objectives, the Canadian and American responses were categorized into small (less than \$10 million), medium (\$10-\$50 million) and large (over \$50 million) sized companies. Table 5.6 displays the mean ratings of each objective for different sized Canadian and American companies. Discriminant analysis was performed to determine whether there was a significant difference

**Table 5.5 - Mean Ratings for the Importance of Investment Objectives -
by Canadian and American companies**

Objectives	Mean	
	Canadian (n=93)	American (n=59)
to benefit from federal govt incentives	2.6	2.7
to benefit from state or provincial incentives	2.5	2.7
to overcome inter-state or inter-provincial trade barriers	2.5	2.3
to benefit from local govt incentives	<u>2.5</u>	<u>2.6</u>
Factor 1: Government	2.5	2.6
to get closer to existing or potential customers	4.0	4.0
to get closer to major new markets	3.9	3.9
to protect existing markets	3.0	3.1
to get closer to major suppliers	2.5	2.7
to follow competitors who have invested there	<u>2.2</u>	<u>2.3</u>
Factor 2: Market	3.1	3.2
to establish a presence in the US (Cdn respondents)	3.8	n/a
to establish a presence in Canada (US respondents)	n/a	2.9
to meet govt requirements	2.7	2.9
to overcome national trade barriers	<u>2.8</u>	<u>2.9</u>
Factor 3: Country presence	3.1	2.9
to access special design, engineering, & other skills	3.4	3.4
to benefit from lower labour costs or higher productivity	2.8	3.3
to lower production costs	<u>2.6</u>	<u>3.1</u>
Factor 4: Labour/production costs	2.9	3.3
to locate in a better climate for investment & business	3.1	3.4
to benefit or guard against currency fluctuations	<u>2.3</u>	<u>2.4</u>
Factor 5: Risk hedging	2.7	2.9

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1= not important at all to 5= very important

The factors are based on the analysis for the whole sample, n=164.

between how small, medium and large sized high technology companies, in both Canada and the United States, rated the importance of investment objectives. Given the breakdown of data, by company size and country, the resulting groups are small. Consequently, for more

**Table 5.6 -Means for the Importance of Investment Objectives -
by Canadian and American Companies According to Size**

Investment Objectives	Canadian Companies			American Companies		
	<\$10M	\$10-\$50M	>\$50M	<\$10M	\$10-\$50M	>\$50M
benefit from fed. govt incentives	2.5	2.6	3.2	2.4	2.3	2.9
benefit from prov. govt incentives	2.4	2.5	2.9	2.5	2.3	3.0
overcome prov. trade barriers	2.4	2.1	3.1	2.4	2.6	2.2
benefit from local govt incentives	2.4	2.4	2.8	2.4	2.2	3.0
Factor 1: Government	2.4	2.4	3.0	2.4	2.4	2.8
closer to existing/potential cust.	3.9	4.2	4.2	3.7	4.3	3.9
closer to major new markets	3.8	3.8	4.1	3.6	4.3	3.8
closer to major suppliers	2.5	2.1	2.8	1.9	3.1	2.7
follow competitors	2.2	2.0	2.4	2.1	2.6	2.2
Factor 2: Market	3.1	3.0	3.4	2.8	3.6	3.2
establish US presence (Cdn resp.)	<u>4.1</u>	3.9	3.3	n/a	n/a	n/a
establish Cdn presence (US resp)	n/a	n/a	n/a	2.7	2.9	2.8
meet govt requirements	2.4	2.5	<u>3.6</u>	2.5	2.7	3.0
overcome national trade barriers	2.7	2.7	3.2	2.6	2.6	3.2
Factor 3: Country presence	3.1	3.0	3.4	2.6	2.7	3.0
access skills	3.3	3.3	<u>4.3</u>	3.4	3.1	3.7
benefit from lower labour costs	2.6	2.6	<u>3.6</u>	3.4	2.9	3.4
lower production costs	2.4	2.5	<u>3.3</u>	3.4	2.8	3.1
Factor 4: Labour/production costs	2.7	2.8	3.7	3.4	2.9	3.4
better climate for investment	3.1	3.0	3.5	3.4	3.1	3.5
guard against currency fluctuation	2.1	2.4	2.4	2.0	2.3	2.5
Factor 5: Risk hedging	2.6	2.7	3.0	2.7	2.7	3.0

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1 = not important at all to 5 = very important

Double Underline = variables that are significantly different at 0.05 level and received the highest rating

The factors are based on the analysis for the whole sample, n=164.

accurate findings the analysis was conducted separately for each investment objective factor. The results of the pairwise multivariate tests are presented in Appendix E. The p-values indicated that small, medium and large sized American high technology companies did not significantly differ at the 0.05 level. As well, no significant difference was detected for different sized Canadian companies on the Government, Market, and Risk Hedging factors. However, a significant difference at the 0.05 level was detected for Country Presence and Labour/Production Costs factors. Various t-tests were run to determine which variables contributed to each of the significant pairwise group differences. Results are also presented in Appendix E. The findings indicate that 'establishing a presence in the United States' was significantly more important to small sized Canadian companies. No significant difference was noted between medium and large sized Canadian companies on this variable. Large sized Canadian companies considered the investment objective 'to meet government requirements' significantly more important than small and medium sized companies. As well, Canadian companies did not differ in their rating on the investment objective 'to overcome national trade barriers'. Regardless of company size, this objective did not receive too high a rating. This can be explained by the free-trade agreements that currently exist between Canada and the United States.

Various t-tests were also run to determine which variables contributed to each of the significant pairwise group differences on the Labour/Production Costs factor. A significant difference was detected on all the variables that cluster to form this factor: to access skills,

to benefit from lower labour costs, and to lower production costs. Large sized Canadian companies attributed higher importance ratings to these variables.

Although the differences are not statistically significant, it should be noted that large sized American and Canadian companies gave an overall higher rating to government related investment objectives. Large sized companies are actively sought by various levels of government who will implement policies that will attract investment. Goss and Phillips (1994) argued that firms are profit maximizing organizations whose goal is to obtain the greatest margin between revenues and costs. Consequently, various levels of government may implement industrial location incentives that can reduce business costs and thus, influence a firm's location decision. This finding is also supported by a comment that was made by the VP of Marketing for a large Ottawa based firm who stated that they look at all types of government policies that are available to them.

In conclusion, this section has confirmed that the main objectives for investment by high technology companies are Market or Labour/Production Costs related. 'To get closer to existing or potential customers' and 'to get closer to major new markets' are the two objectives that received the highest rating by both Canadians and Americans. Findings also indicated that small sized Canadian companies placed greater importance than large and medium sized companies on establishing a US presence, while large Canadian firms placed greater importance on labour and production variables.

5.4 IMPORTANCE OF LOCATION VARIABLES

Section 2 of the questionnaire asked respondents to assess the importance of various characteristics of potential investment locations in North America. As observed in the literature review, there exists little consensus regarding the importance of various location criteria to high technology companies. This section is devoted to determining the importance of various location criteria to telecommunications, computer hardware and computer software firms. The overall means will be examined. A significant difference was noted in American and Canadian ratings and will be discussed below. As well, differences in the importance ratings of various variables based on company size and the educational background of the respondents will also be discussed.

Table 5.7 displays the mean ratings for the importance of location variables. Factor analysis was performed in order to understand the underlying factors relating to the 30 location variables. Varimax rotation was used and seven factors were extracted. The groupings of the statements for each factor were interpreted as: Quality of life (factor 1), Government/Regulation (factor 2), General Infrastructure (factor 3), Skills (factor 4), Technology Infrastructure (factor 5), Market (factor 6), and Centrality (factor 7). Two other factors, Labour (factor 8) and Other (factor 9) were nominally significant but barely exceeded an Eigen value of 1.0, and contained variables with weaker loadings (over 0.4 but below 0.5). These factors can assist in understanding the underlying constructs of the variables and will be discussed where appropriate. The factor loadings of the variables are also presented in Table 5.7, as is the variance explained by each factor.

Table 5.7 - Means Ratings for the Importance of Location Variables, n=164		
Importance	Mean	Factor Loadings
PART A: Significant factors with variable loadings of 0.5 or higher		
physical climate	2.91	.74
cost of living	3.10	.73
crime level	3.22	.75
housing, schooling & recreational facilities	3.15	.72
overall quality of life	<u>3.71</u>	<u>.76</u>
Factor 1: Quality of life	3.20	31.4%*
government attitude to business & investment	3.61	.66
availability of government incentives for investment	2.91	.69
national regulatory practices	2.96	.83
regional regulatory practices	2.95	.83
local tax structure for business	3.52	.79
provincial/national tax structure for business	<u>3.48</u>	<u>.82</u>
Factor 2: Government/Regulation	3.20	10.2%*
energy and related utility costs	2.42	0.72
overall physical infrastructure	3.20	0.52
proximity to suppliers	<u>2.59</u>	<u>0.75</u>
Factor 3: General Infrastructure	2.70	6.9%*
local availability of the right labour skills	3.97	.72
local availability of technical & professional services	4.00	.82
local availability of expert managers	<u>3.63</u>	<u>.76</u>
Factor 4: Skills	3.90	6.0%*
presence of leading companies or entrepreneurs	3.21	.73
access to R&D facilities	2.91	.70
presence of universities & industry research centres	3.25	.72
availability of venture capital	2.35	.70
overall level of technological advancement	3.60	.51
availability of suitable sites in research parks	<u>2.85</u>	<u>.67</u>
Factor 5: Technology Infrastructure	3.00	5.4%*
size and potential of local market	3.63	.84
proximity to major customers and markets	<u>4.02</u>	<u>.82</u>
Factor 6: Market	3.80	4.5%*
proximity to large urban centres	3.26	.66
proximity to complementary or competing companies	<u>2.66</u>	<u>.70</u>
Factor 7: Centrality	3.00	3.6%*
PART B: Other factors with variable loadings of 0.40-0.49		
labour costs	2.91	-.47
industriousness of the work force	<u>3.53</u>	<u>-.49</u>
Factor 8: Labour	3.20	3.6%*
proximity to other existing operations	<u>2.88</u>	<u>.75</u>
Factor 9: Other	2.88	3.3%*

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1 = not important at all to 5 = very important. Factor analysis was performed on the whole sample. * = percent of variance accounted for by the factor.

Factor 1- Quality of Life accounts for 31.4% of the variance and includes several variables with relatively high means, such as 3.10 for cost of living, 3.22 for crime level, 3.15 for housing, schooling & recreational facilities, and 3.71 for overall quality of life. These variables point to the importance of such variables in investment decisions. Factor 2, Government/Regulation accounts for the second largest amount of variance (10.2%) and includes three variables with high mean scores that tend to emphasize tax and government attitude issues rather than regulatory practices (3.61 for government attitude to business & investment, 3.52 for local tax structure for business, and 3.48 for provincial/national tax structure for business). The remaining factors explain smaller proportions of the variance. Of these, Factor 6 - Market and Factor 4 - Skills include several variables with the highest mean scores, such as, 'size and potential of local market'(3.63) and 'proximity to major customers and markets' (4.02), and three "Skills" variables with a factor score of 3.90. Overall, the eight factors account for 71.2% of the total variance.

Table 5.7 reveals that 'proximity to major customers and markets' was the highest rated location variable. As noted earlier, this variable was considered the most important investment objective by respondents. This location variable also supports findings from the Christy and Ironside (1985) study, the Stafford (1983) study and the Joint Economic Congress Survey (1982) where it ranked third, fourth and seventh respectively. Another Market variable, 'size and potential of the local market' also received a high rating by the respondents, and was found by Steed and DeGenova (1983) to have contributed to the development of Ottawa's high technology community. However, these two variables,

although considered important by the respondents, accounted for only 4.5% of the total variance in the data.

High technology companies are also dependent upon a highly skilled labour force. This is evident by the fact that the three variables that form the Skills factor ranked in the top five with regards to importance, as per questionnaire responses. 'Local availability of technical and professional services' was given the second highest rating by the respondents. This was closely followed by 'local availability of the right labour skills' and 'local availability of expert managers'. Past studies have confirmed that labour/skills is one of the most important location determinants for high technology plants. The Joint Economic Congress Survey (1982), Glasmeier et al Survey (1982) and the Stafford (1983) study had labour skills/availability rated as the most important factor that influences high technology plant location. This factor has also been rated in the top five in other studies [Steed and DeGenova (1983), Congress of the United States Office of the Technology Assessment Survey (1984); Christy and Ironside (1985)].

The high rating that 'the overall quality of life' variable received supports previous studies which suggested that high technology companies seek a location that is desirable to its employees. Stafford (1983) found that quality of life was ranked third as a location determinant for high technology companies. Malecki (1984) also noted the importance of this variable in attracting scientists, engineers and managers. Other variables that form the Quality of Life factor and which received a high rating are as follows: cost of living, crime level, and

housing, schooling & recreational facilities. Physical climate was not considered as important as the other Quality of life variables mentioned above.

The Technology Infrastructure factor also consists of various variables that respondents considered important. Presence of leading companies or entrepreneurs, presence of universities & industry research centres, and overall level of technological advancement were all location variables that respondents considered important. Respondents rated 'availability of venture capital' as the least important location variable. This counters findings from Herbig and Golden (1993) who found that venture capital was necessary to the development of innovative high technology hot spots.

The Labour factor was considered important to high technology companies and the industriousness of the workforce received a high rating by the respondents. Surprisingly, however, the labour costs variable was not considered very important. In a study conducted by the Joint Economic Congress Survey (1982) this variable had ranked second in importance, and fifth in a study conducted by Bednarz's Texas Locational Study (1984).

Various variables in the Government/Regulation Factor also had high means. Government attitude to business and investment, local tax structure, and provincial/national tax structure for business are all location variables that the respondents considered important. This supports findings from the Joint Economic Congress Survey (1982) which found that tax climate was the third most important variable to its respondents.

Overall, given the responses, the Government/Regulation, Quality of Life, and Labour are all factors that tied for third in importance. The Skills factor ranked first, closely followed by the Market factor. The factors that did not receive high rankings are General Infrastructure and Other.

For a better understanding on the importance of location variables, further analysis of the questionnaire responses was conducted. Table 5.8 displays the mean ratings of each location variable for Canadian and American companies. Multivariate tests of significance (MANOVA) were performed and it was found that the responses of Canadians and Americans are significantly different at the 0.05 level. Results are presented in Appendix F. Given that the multivariate tests were significant, each univariate test was examined at the 0.05 level. Americans rated several variables as significantly more important than Canadians. For instance, Americans gave a higher rating to many of the elements that comprise the technology infrastructure factor. That is, they considered presence of local universities/research centres, overall level of technological advancement and availability of suitable sites in research parks as more important than their Canadian counterparts. Americans also differed from Canadians in placing greater importance on physical climate, and housing, schooling and cultural/recreational facilities variables. The importance that Americans place on various Quality of Life variables underscores the importance of locating in an area that is desirable to a highly skilled labour force [Malecki (1984)]. Americans also

Table 5.8 - Means of Location Variable Importance - by Canadians and Americans

Importance	Canadians n=100	Americans n=64
PART A: Significant factors with variable loadings of 0.5 or higher		
physical climate	2.72	<u>3.26</u>
cost of living	<u>3.00</u>	<u>3.00</u>
crime level	3.19	3.29
housing, schooling & recreational facilities	3.00	<u>3.42</u>
overall quality of life	<u>3.70</u>	<u>3.76</u>
Factor 1: Quality of life	3.12	3.35
government attitude to business & investment	3.57	3.66
availability of government incentives for investment	2.92	2.87
national regulatory practices	2.91	3.06
regional regulatory practices	2.92	3.02
local tax structure for business	3.46	3.58
provincial/national tax structure for business	<u>3.44</u>	<u>3.52</u>
Factor 2: Government/Regulation	3.20	3.29
energy and related utility costs	2.27	<u>2.65</u>
overall physical infrastructure	3.35	3.09
proximity to suppliers	<u>2.52</u>	<u>2.71</u>
Factor 3: General Infrastructure	2.71	2.82
local availability of the right labour skills	3.87	4.11
local availability of technical & professional services	3.98	4.02
local availability of expert managers	<u>3.59</u>	<u>3.71</u>
Factor 4: Skills	3.81	3.95
presence of leading companies or entrepreneurs	3.14	3.35
access to R&D facilities	2.79	3.15
presence of universities & industry research centres	3.07	<u>3.55</u>
availability of venture capital	2.39	2.34
overall level of technological advancement	3.43	<u>3.87</u>
availability of suitable sites in research parks	<u>2.70</u>	<u>3.10</u>
Factor 5: Technology Infrastructure	2.92	3.23
size and potential of local market	3.55	3.79
proximity to major customers and markets	<u>4.02</u>	<u>4.08</u>
Factor 6: Market	3.79	3.94
proximity to large urban centres	3.28	3.23
proximity to complementary or competing companies	<u>2.71</u>	<u>2.60</u>
Factor 7: Centrality	3.00	2.92
PART B: Other factors with variable loadings of 0.4-0.49		
labour costs	2.73	<u>3.18</u>
industriousness of the work force	<u>3.31</u>	<u>3.87</u>
Factor 8: Labour	3.02	3.53
proximity to other existing operations	<u>2.69</u>	<u>3.19</u>
Factor 9: Other	2.69	3.19

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1= not important at all to 5= very important.

Double Underline = significantly different at 0.05 level. Factor analysis was performed on the entire sample

gave higher ratings to the following location variables: low labour costs, proximity to other existing operations of their company, energy utility, and industriousness of the workforce.

A second breakdown of the sample was among computer software, computer hardware and telecommunication companies. The mean ratings are presented in Table 5.9. Discriminant analysis was performed to determine whether there was a significant difference between how companies in different industries rate the importance of location variables. The results of the pairwise multivariate tests are presented in Appendix G. The overall level for the pairwise T^2 tests was set at 15%, which means that a 5% Bonferroni level was used for the three individual pairwise tests (Stevens 1992: p.198). The p-values indicated that there was no significant difference between the following groups: software - telecommunication, telecommunication - hardware. However, a significant difference was detected between software and hardware companies at the 0.05 level and univariate t-tests were run to determine which variables contributed to the significant pairwise group difference. Results are also presented in Appendix G. Computer hardware companies gave higher ratings to the variables that cluster to form the General Infrastructure factor. That is, hardware companies gave higher importance ratings than software companies to energy and related utility costs, overall physical infrastructure, and proximity to suppliers variables. Computer hardware companies also place greater importance on the Government/Regulation factor. Companies in this industry consider national and regional regulatory practices, government attitude to business and investment, and local tax structure for business significantly more important than companies in the software industry. Computer hardware companies also gave higher ratings

Table 5.9 - Means of Location Variable Importance - by Sector

	Software n=80	Hardware n=35	Telecom n=36
Importance			
PART A: Significant factors with variable loadings of 0.5 or higher			
physical climate	2.80	2.94	3.11
cost of living	2.99	3.09	3.22
crime level	3.02	3.37	3.50
housing, schooling & recreational facilities	3.01	3.34	3.22
overall quality of life	<u>3.59</u>	<u>3.86</u>	<u>3.81</u>
Factor 1: Quality of life	3.08	3.32	3.37
government attitude to business & investment	3.42	<u>3.94</u>	3.67
availability of government incentives for investment	2.77	<u>3.00</u>	3.03
national regulatory practices	2.68	<u>3.37</u>	3.22
regional regulatory practices	2.67	<u>3.40</u>	3.14
local tax structure for business	3.37	<u>3.82</u>	3.47
provincial/national tax structure for business	<u>3.34</u>	<u>3.66</u>	<u>3.56</u>
Factor 2: Government/Regulation	3.04	3.53	3.35
energy and related utility costs	2.07	<u>2.74</u>	2.67
overall physical infrastructure	2.90	<u>3.63</u>	3.31
proximity to suppliers	<u>2.29</u>	<u>3.09</u>	<u>2.75</u>
Factor 3: General Infrastructure	2.42	3.15	2.91
local availability of the right labour skills	3.94	4.11	3.89
local availability of technical & professional services	3.96	4.11	3.97
local availability of expert managers	<u>3.69</u>	<u>3.69</u>	<u>3.44</u>
Factor 4: Skills	3.86	3.97	3.77
presence of leading companies or entrepreneurs	3.14	3.40	3.31
access to R&D facilities	2.68	<u>3.23</u>	3.14
presence of universities & industry research centres	3.24	<u>3.54</u>	3.14
availability of venture capital	2.20	<u>2.86</u>	2.31
overall level of technological advancement	3.51	<u>3.74</u>	3.64
availability of suitable sites in research parks	<u>2.64</u>	<u>3.06</u>	<u>3.03</u>
Factor 5: Technology Infrastructure	2.90	3.31	3.10
size and potential of local market	3.70	3.49	3.61
proximity to major customers and markets	<u>4.19</u>	<u>3.63</u>	<u>4.14</u>
Factor 6: Market	3.95	3.56	3.88
proximity to large urban centres	3.40	3.09	3.31
proximity to complementary or competing companies	<u>2.70</u>	<u>2.54</u>	<u>2.69</u>
Factor 7: Centrality	3.05	2.82	3.00
PART B: Other factors with variable loadings of 0.4-0.49			
labour costs	2.63	<u>3.37</u>	2.89
industriousness of the work force	<u>3.16</u>	<u>4.03</u>	<u>3.69</u>
Factor 8: Labour	2.90	3.70	3.29
proximity to other existing operations	<u>2.75</u>	<u>2.85</u>	<u>3.14</u>
Factor 9: Other	2.75	2.85	3.14

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1= not important at all to 5= very important.

Double Underline= significantly different at 0.05 level between software and hardware companies with higher one underlined.

to the variables that form the Labour factor. Companies in the software industry gave a higher importance rating to 'proximity to major customers and markets'. Finally, a significant difference was also detected between hardware and software firms on two variables that belong to the Technology Infrastructure factor. Computer hardware companies gave higher importance ratings to these two variables: access to R&D facilities and availability of venture capital.

Overall, a significant difference was detected between computer hardware and software companies in their evaluation on the importance of location criteria. Policy makers developing marketing strategies to attract high technology companies should note the differences that exist between these two types of industries.

Analysis was also conducted to determine whether a respondent's educational background influenced their assessment on the importance of location criteria. Respondents with a bachelor's or a master's degree were classified into two categories: science or other. The 'science' category includes chemistry, physics, math, engineering, and computer science. The 'other' category includes business, economics, accounting, public administration, etc. Table 5.10 displays the mean ratings of each location variable for respondents with an educational background in either science or other. Multivariate analysis of variance was performed and are presented in Appendix H. The findings indicate that there are no significant differences in the responses of these two types of respondents. Therefore, the educational background of the respondents does not influence their rating on the importance of location variables to high technology companies.

Table 5.10 - Means of Location Variable Importance - by Educational Background

Importance	Education in Science n=49	Education: Other n=69
PART A: Significant factors with variable loadings of 0.5 or higher		
physical climate	3.00	2.87
cost of living	3.23	3.13
crime level	3.35	3.10
housing, schooling & recreational facilities	3.28	3.13
overall quality of life	<u>3.77</u>	<u>3.57</u>
Factor 1: Quality of life	3.33	3.16
government attitude to business & investment	3.72	3.56
availability of government incentives for investment	2.74	2.90
national regulatory practices	3.12	2.90
regional regulatory practices	3.00	2.89
local tax structure for business	3.58	3.41
provincial/national tax structure for business	<u>3.53</u>	<u>3.35</u>
Factor 2: Government/Regulation	3.28	3.17
energy and related utility costs	2.35	2.41
overall physical infrastructure	3.26	3.16
proximity to suppliers	<u>2.51</u>	<u>2.59</u>
Factor 3: General Infrastructure	2.71	2.72
local availability of the right labour skills	3.93	3.95
local availability of technical & professional services	4.05	4.05
local availability of expert managers	<u>3.63</u>	<u>3.60</u>
Factor 4: Skills	3.87	3.87
presence of leading companies or entrepreneurs	3.30	3.27
access to R&D facilities	3.14	2.92
presence of universities & industry research centres	3.16	3.27
availability of venture capital	2.49	2.10
overall level of technological advancement	3.60	3.59
availability of suitable sites in research parks	<u>2.91</u>	<u>2.87</u>
Factor 5: Technology Infrastructure	3.10	3.00
size and potential of local market	3.49	3.89
proximity to major customers and markets	<u>3.86</u>	<u>4.24</u>
Factor 6: Market	3.68	4.07
proximity to large urban centres	3.16	3.32
proximity to complementary or competing companies	<u>2.49</u>	<u>2.71</u>
Factor 7: Centrality	2.83	3.02
PART B: Other factors with variable loadings of 0.4-0.49		
labour costs	3.07	2.86
industriousness of the work force	<u>3.67</u>	<u>3.48</u>
Factor 8: Labour	3.37	3.17
proximity to other existing operations	<u>2.93</u>	<u>3.10</u>
Factor 9: Other	2.93	3.10

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1 = not important at all to 5 = very important

The factors are based on the analysis for the whole sample, n=164.

In conclusion, from the analysis on the importance of the location variables, it is apparent that availability of appropriate skills is a necessary criterion that firms consider in their assessment of a location for investment. The analysis has indicated that regardless of whether the company is American or Canadian or whether the company is in the software, hardware or telecommunication sector, skills are a necessary component to these companies and is thus a location factor that receives a high ranking. This section has also confirmed the importance of the Market factor which received the second highest rating. The importance of the Skills and Market factors also reaffirms the earlier findings regarding the importance of investment objectives, where Market and Labour/Production Costs factors obtained the highest rankings. Factor analysis also revealed seven factors that explain the underlying constructs of the data. Of these, Quality of Life accounted for 31.4% of the total variance and suggests that the variables included play a role in investment decisions.

5.5 USE OF INFORMATION SOURCES

Section 3 of the questionnaire asked respondents to assess the importance of information sources that might be used to choose among alternative locations for investment. Table 5.11 displays the mean ratings for the importance of information sources. Factor analysis was performed in order to understand the underlying factors relating to the 20 information sources. Varimax rotation was used and seven factors were extracted. The grouping of the

Table 5.11- Means of Information Sources Importance

Importance	Mean	Factor Loadings
PART A: Significant factors with variable loadings of 0.5 or higher		
statistics and information published by local agencies	2.86	.56
national or state/provincial govt department	2.98	.87
local govt departments and agencies	2.98	.89
Chamber of Commerce	<u>2.66</u>	<u>.63</u>
Factor 1: Public Sector	2.87	30.1%
business partners at the target regions	3.75	.69
customers in the target regions	3.97	.76
competitors that do business in the target regions	3.06	.66
other industry firms that do business in the target regions	<u>3.19</u>	<u>.72</u>
Factor 2: Private Sector	3.50	9.2%
local law firms	2.35	.83
local pleasure visits	2.48	.59
local real estate agents	<u>2.45</u>	<u>.82</u>
Factor 3: Local Non-Industry	2.43	8.8%
outside consultants	2.95	.75
investment missions	<u>2.64</u>	<u>.69</u>
Factor 4: Investigative	2.80	6.6%
business magazines and newspapers	3.00	.53
own research surveys	3.68	.77
local business visits	<u>3.33</u>	<u>.63</u>
Factor 5: Company	3.34	5.7%
Internet/World Wide Web	3.39	.68
educational institutions	<u>3.27</u>	<u>.72</u>
Factor 6: General Information	3.33	5.4%
PART B: Other factors with variable loadings of 0.4-0.49		
suppliers and/or distributors	2.91	.45
investment promotion materials by local agencies	<u>2.45</u>	<u>.47</u>
Factor 7: Other	2.68	5.4%

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1 = not important at all to 5 = very important
The factors are based on the analysis for the whole sample, n=164.

statements for each factor were interpreted as: Public Sector (factor 1), Private Sector (factor 2), Local Non-Industry (factor 3), Investigative (factor 4), Company (factor 5), General Information (factor 6) and Other (factor 7). Although the first factor, Public Sector explains the highest percent of the variance, the variables loading on it are not rated highly. The reverse is the case with the Private sector sources, which were rated highly but, taken together, explain only 9.2% of the variance. The five factors combined explained 82% of the total variance.

The Private Sector factor ranked first in terms of mean scores. The variables that cluster to form this factor are business partners at the target regions, customers in the target regions, competitors that do business in the target regions, and other industry firms that do business in the target regions. As noted earlier, the highest rated objective is market related. Respondents considered 'getting closer to existing or potential customers' the main motive that drives decisions to expand. This was closely followed by two other market related objectives: to get closer to major new markets and to protect the existing market. Consequently, it is easy to understand why companies rely heavily upon customers in the target regions as sources of information. As well, companies that want to protect new or existing markets use business partners or competitors in the target regions as sources of information. Many companies allow their competitors to do the market research and when a location has been selected follow that competitor to that area. These sources of information are also credible. Companies can rely on information that is provided by business partners and customers regarding the investment potential of various regions.

The Company factor also had a high rating. The variables that cluster to form this factor include business magazines and newspapers, own research surveys, and local business visits. Conducting one's own research surveys is only prudent given that companies differ in various capacities and thus research is necessary to ensure compatibility between a company and a location.

The variables that clustered to form the General Information factor are: Internet/World Wide Web, and educational institutions. It is interesting to note the importance of the World Wide Web as a source of information for companies determining the desirability of a potential site. Many of the information sources, i.e. Chamber of Commerce, educational institutions, local government departments and agencies, currently have Web pages on the Internet which are accessible to the respondents. The Internet is also a source of information that is not very costly to the respondent.

The variables that clustered to form the remaining four factors, Public Sector, Local Non-Industry, Investigative, and Other were considered of low importance as sources of information by the respondents.

The various sources provide different types of information that are appropriate at various stages of the investment decision process. For instance, the Public Sector factor provides general information about an area, such as the level of unemployment or local taxes. The Local Non-Industry factor becomes a more relevant source of information after a decision to

invest has been made. For instance, obtaining in-depth information about appropriate procedures such as the transfer of property, etc.

For a better understanding of the importance of information sources, further analysis of the questionnaire responses was conducted. Table 5.12 displays the mean ratings of each location variable for Canadian and American companies. It is apparent from the findings that there does not exist a significant difference in how Americans and Canadians rated the importance of information sources. However, multivariate tests of significance (MANOVA) were performed and reaffirmed that there was no significant difference in the responses (See Appendix I). Given that the multivariate test of significance can be conservative, the individual univariate tests were also considered. Stevens (1992) states that a less conservative approach would be to examine each t-test at α/p level of significance (α = level of significance). "Then we are assured by the Bonferroni inequality that the overall type I error rate for the set of t tests will be less than α " (Stevens 1992: p.160). Therefore, α was set at $0.15/20 = 0.0075$ for each t-test. These tests were examined, to ensure that no interesting observation were hidden due to any lack of power. The univariate t-tests re-affirmed that there is no significant difference between Canadian and American respondents regarding their evaluation of the importance of information sources.

Further analysis was conducted to determine whether respondents with total versus major responsibilities in investment decisions differed from those respondents with minor responsibilities regarding the importance of information sources. Results are presented in

**Table 5.12 - Means of Information Sources Importance -
by Canadian and American Respondents**

Importance	Mean	
	Canadians n=93	Americans n=59
PART A: Significant factors with variable loadings of 0.5 or higher		
statistics and information published by local agencies	2.8	2.9
national or state/provincial govt department	3.0	3.0
local govt departments and agencies	2.9	3.0
Chamber of Commerce	<u>2.6</u>	<u>2.8</u>
Factor 1: Public Sector	2.8	2.9
business partners at the target regions	3.8	3.7
customers in the target regions	3.9	4.0
competitors that do business in the target regions	3.3	3.1
other industry firms that do business in the target regions	<u>3.1</u>	<u>3.0</u>
Factor 2: Private Sector	3.5	3.5
local law firms	2.3	2.5
local pleasure visits	2.4	2.7
local real estate agents	<u>2.3</u>	<u>2.7</u>
Factor 3: Local Non-Industry	2.3	2.6
outside consultants	2.9	3.1
investment missions	<u>2.7</u>	<u>2.6</u>
Factor 4: Investigative	2.8	2.9
business magazines and newspapers	3.0	3.0
own research surveys	3.6	3.7
local business visits	<u>3.4</u>	<u>3.3</u>
Factor 5: Company	3.3	3.3
Internet/World Wide Web	3.3	3.5
educational institutions	<u>3.2</u>	<u>3.5</u>
Factor 6: General Information	3.3	3.5
PART B: Other factors with variable loadings of 0.4-0.49		
suppliers and/or distributors	2.9	2.9
investment promotion materials by local agencies	<u>2.5</u>	<u>2.4</u>
Factor 7: Other	2.7	2.7

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1 = not important at all to 5 = very important
The factors are based on the analysis for the whole sample, n=164.

Table 5.13. Multivariate tests of significance (MANOVA) were performed and reaffirmed that there was no significant difference in the responses (See Appendix J). Given that the multivariate tests of significance can be conservative, the individual univariate tests were also considered. The α was set at $0.15/20 = 0.0075$ for each t-test. These tests were examined, to ensure that no interesting conditions were hidden due to lack of power. The univariate t-tests re-affirmed that there is no significant difference. Therefore, the findings reveal that regardless of the respondent's level of responsibility, the importance of the information sources does not alter. The ranking of the information sources, according to their level of importance, remains: Private Sector, Company, General Information, Public Sector, Investigative, Other, and Local Non-Industry factors.

In conclusion, the analysis has shown that the Private Sector and Company factors are the most relevant sources of information to high technology companies. It was also surprising to note the growing popularity of the Internet as a source of information. This a relatively new medium for communication and regions should actively consider using this source as a tool for marketing.

**Table 5.13 - Means of Information Sources Importance -
by respondents with total and minor degrees of responsibility**

Importance	Mean	
	Total Resp. n=118	Minor Resp. n=34
PART A: Significant factors with variable loadings of 0.5 or higher		
statistics and information published by local agencies	3.06	2.78
national or state/provincial govt department	2.89	3.21
local govt departments and agencies	2.91	3.15
chamber of Commerce	<u>2.59</u>	<u>2.91</u>
Factor 1: Public Sector	2.86	3.01
business partners at the target regions	3.79	3.62
customers in the target regions	3.95	4.12
competitors that do business in the target regions	3.10	2.91
other industry firms that do business in the target regions	<u>3.20</u>	<u>3.21</u>
Factor 2: Private Sector	3.51	3.47
local law firms	2.33	2.41
local pleasure visits	2.50	2.50
local real estate agents	<u>2.62</u>	<u>2.40</u>
Factor 3: Local Non-Industry	2.48	2.44
outside consultants	2.84	3.26
investment missions	<u>2.60</u>	<u>2.76</u>
Factor 4: Investigative	2.72	3.01
business magazines and newspapers	3.04	2.91
own research surveys	3.66	3.74
local business visits	<u>3.33</u>	<u>3.29</u>
Factor 5: Company	3.34	3.31
Internet/World Wide Web	3.38	3.41
educational institutions	<u>3.24</u>	<u>3.50</u>
Factor 6: General Information	3.31	3.46
PART B: Other factors with variable loadings of 0.4-0.49		
suppliers and/or distributors	2.91	2.91
investment promotion materials by local agencies	<u>2.41</u>	<u>2.53</u>
Factor 7: Other	2.66	2.72

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1 = not important at all to 5 = very important
The factors are based on the analysis for the whole sample, n=164.

5.6 GENERAL RESULTS AND VARIANCE ANALYSIS OF REGIONS

This section will look at how the respondents viewed the various regions. The overall means for each region were examined to determine how the respondents rated each region based on the location criteria. Given that the region profile comparisons differed, it is of interest to determine which variables were rated as significantly different by respondents. Further analysis was then conducted to determine on which variables the regions differed in the evaluations by American and Canadian respondents.

Table 5.14 provides a summary of the mean ratings for each region. This table indicates that there are considerable differences between region profiles. Palo Alto had the highest average rating score followed by Raleigh, Boston, Ottawa and CTT. Palo Alto received the highest score on 17 of the 32 location criteria. Respondents gave this region the highest rating on five of the top six location variables in terms of their importance. Ottawa had the highest rating for quality of life, which respondents had ranked fourth in importance. Ottawa also rated highly on other variables that form the quality of life factor, namely, low crime level and good housing, schooling and recreational facilities. Of the regions, CTT received the lowest score on 20 of the 32 variables and did not attain the highest rating on any variable. Raleigh received the highest rating on all the elements that comprise the government/regulation factor. Boston was acknowledged for the presence of local universities/research centres by obtaining the highest rating for this variable.

Table 5.14 - Means for Region Items

n=164

<i>Location Variables</i>	<i>Ottawa</i>	<i>CTT</i>	<i>Boston</i>	<i>Palo Alto</i>	<i>Raleigh</i>
physical climate	<u>2.24</u>	2.54	2.77	4.25	3.71
cost of living	3.26	3.33	2.64	<u>2.04</u>	3.51
crime level	3.78	3.60	2.55	<u>2.50</u>	3.17
housing, schooling & recreational facilities	3.65	3.41	3.57	<u>3.30</u>	3.46
overall quality of life	3.65	3.37	<u>3.22</u>	3.35	3.61
<i>Factor 1: Quality of life</i>	3.32	3.25	<u>2.95</u>	3.09	3.49
availability of govt incentives for investment	2.88	2.82	2.90	<u>2.66</u>	3.20
national (Canada US) regulatory practices	2.84	<u>2.79</u>	2.97	3.04	3.17
govt attitude to business and investment	2.96	<u>2.90</u>	3.06	3.51	3.56
regional regulatory practices	2.85	<u>2.81</u>	2.91	2.89	3.27
local tax structure for business	3.68	<u>2.73</u>	2.92	2.95	3.44
provincial national tax structure for business	<u>2.75</u>	<u>2.75</u>	2.94	2.99	3.34
<i>Factor 2: Government/Regulation</i>	2.99	<u>2.80</u>	2.95	3.01	3.33
energy and related utility costs	3.21	3.03	2.83	<u>2.71</u>	3.29
overall physical infrastructure	3.36	<u>3.14</u>	3.40	3.63	3.60
proximity to suppliers	<u>2.68</u>	<u>2.68</u>	3.45	3.78	2.94
<i>Factor 3: General Infrastructure</i>	3.08	<u>2.95</u>	3.23	3.37	3.28
local availability of right labour skills	3.25	<u>2.99</u>	3.51	3.83	3.36
local availability of technical services	3.47	<u>3.11</u>	3.83	4.12	3.71
local availability of expert managers	3.26	<u>2.90</u>	3.74	3.92	3.51
<i>Factor 4: Skills</i>	3.33	<u>3.00</u>	3.69	3.96	3.53
presence of leading companies entrepreneurs	3.55	<u>3.02</u>	4.08	4.46	3.64
access to R&D facilities	3.40	<u>3.26</u>	4.08	4.32	3.75
presence of local universities research centres	<u>3.38</u>	3.62	4.27	4.27	3.86
availability of venture capital	2.80	<u>2.67</u>	3.67	3.99	3.21
overall level of technological advancement	3.62	<u>3.44</u>	4.20	4.55	3.86
availability of suitable sites in research parks	3.42	<u>3.11</u>	3.78	3.91	3.87
<i>Factor 5: Technology Infrastructure</i>	3.36	<u>3.19</u>	4.01	4.25	3.70
size and potential of local market	2.63	<u>2.43</u>	3.55	3.66	2.89
proximity to major customers and markets	2.92	<u>2.71</u>	3.75	3.78	3.19
<i>Factor 6: Market</i>	2.78	<u>2.57</u>	3.65	3.72	3.04
proximity to large urban centres	<u>3.11</u>	3.18	4.19	4.13	3.14
proximity to complementary competing companies	3.03	<u>2.82</u>	3.70	3.99	3.21
<i>Factor 7: Centrality</i>	3.07	<u>3.00</u>	3.95	4.06	3.18
labour costs	3.10	3.12	2.53	<u>2.16</u>	3.38
industriousness of workforce	3.38	3.29	<u>3.24</u>	3.28	3.45
<i>Factor 8: Labour</i>	3.24	3.21	2.89	<u>2.72</u>	3.42
proximity to existing operations of company	2.79	<u>2.59</u>	2.77	<u>2.59</u>	2.62
<i>Factor 9: Other</i>	2.79	<u>2.59</u>	2.77	<u>2.59</u>	2.62
TOTAL	3.12	2.99	3.35	3.49	3.39

Legend:

Scores can range from 1 (Poor) to 5 (Excellent)

Bold= highest; Underline= lowest score of all the regions

To determine whether the differences held by the respondents about the different regions were significant, doubly multivariate within-subjects comparisons was used. The null hypothesis, that the population means for each region are equal, was rejected at $p < 0.001$. That is, an overall difference was detected indicating that respondents had significantly different attitudes towards the investment potential for each of the regions (See Appendix K for SPSS results).

Given that the null hypothesis was rejected, post hoc procedures were implemented to determine which of the region pairings differed. Pairwise multivariate tests were performed. The overall alpha, the probability of making a Type I error, was set at $0.15/10 = 0.015$ for each pairwise comparison. That is, the overall alpha (0.15) was partitioned evenly over the ten individual pairwise multivariate tests. Table 5.15 provides a summary of all within-subjects pairwise differences and similarities. All pairwise region comparisons were significantly different.

Given that the region profile comparisons differed, it is of interest to determine which variables were rated significantly different by respondents. The individual univariate tests were considered at a Bonferroni level of $0.15/32 = 0.005$ (Stevens 1992: p.198).

Respondents did view a significant difference between the regions. Overall, when the Canadian regions were paired with the American regions, the Canadian regions were given a higher rating on Quality of life variables, while the American regions did well on the other

Table 5.15 - Doubly Multivariate Analysis of Regional Differences
All respondents (n=164)

Overall Doubly Multivariate Significance p = 0.001										
Pairwise Multivariate Significance	P/R	P/O	P/C	P/B	R/O	R/C	R/B	O/C	O/B	C/B
physical climate	P	P	P	P	R	R	B	C	B	
cost of living	R	O	C	B			R		O	C
crime level	R	O	C		O	C	R		O	C
housing, schooling & recreational facilities		O	C	B				O	O	
overall quality of life	R	O					R	O	O	
Factor 1: Quality of Life										
government attitude to business		P	P	P	R	R	R			
availability of govt incentives for investment	R			B		R	R			
regional regulatory practices	R				R	R	R			
local tax structure for business	R	P			R	R	R			
provincial/national tax structure for business	R				R	R	R			
national (Canada/US) regulatory practices					R	R	R			
Factor 2: Government/Regulation										
energy & related utility costs	R	O	C				R		O	
proximity to suppliers	P	P	P		R		B		B	B
overall physical infrastructure		P	P	P	R	R		O		B
Factor 3: General Infrastructure										
local availability of expert managers	P	P	P	P		R		O	B	B
local availability of the right labour skills	P	P	P	P		R		O		B
local availability of technical services	P	P	P	P		R		O	B	B
Factor 4: Skills										
presence of local universities	P	P	P		R		B		B	B
availability of venture capital	P	P	P	P	R	R	B		B	B
presence of leading companies	P	P	P	P		R	B	O	B	B
access to R&D facilities	P	P	P	P	R	R	B	O	B	B
availability of suitable sites in research parks		P	P		R	R		O	B	B
overall level of technological advancement	P	P	P	P			B		B	B
Factor 5: Technology Infrastructure										
proximity to major customers and markets	P	P	P				B		B	B
size and potential of local market	P	P	P			R	B		B	B
Factor 6: Market										
proximity to large urban centres	P	P	P				B		B	B
proximity to complementary companies	P	P	P			R	B	O	B	B
Factor 7: Centrality										
labour costs	R	O	C	B			R		O	C
industriousness of workforce										
Factor 8: Labour										
proximity to operations of our company										
Factor 9: Other										
overall assessment of region in general	P	P	P	P	R	R		O	B	B
overall assessment as site for investment	P	P	P							
Assessment of each region										

Legend:

P=Palo Alto, R=Raleigh, B=Boston, O=Ottawa, C=CTT

Blank = No significant difference between regions

The factors are based on the analysis for the whole sample

location factors. The respondents also viewed a significant difference between Palo Alto and the other American regions on numerous variables. Palo Alto was rated more favourably on variables forming the Market, Skills and Technology Infrastructure factors. When Raleigh was compared to the other American regions, it rated significantly better on Quality of life variables and on Government/Regulation variables. Boston was given a high rating for the presence of local universities & industry research centres (MIT & Harvard). In the pairing between Palo Alto and Boston, there was a significant difference on less than half of the variables. When a significant difference was observed, Palo Alto generally did better than Boston. It is also interesting to note that when a significant difference was noted between Ottawa and CTT, Ottawa always surpassed CTT. No significant difference was noted between Raleigh and Ottawa on the following factors: Labour, Centrality, Market and Skills. To determine whether Canadians and Americans find similar significant differences on the location variables, further analysis was conducted.

5.6.1 Canadian respondents

For a better understanding of the investment climate for each region, multivariate within-subjects comparisons was used to determine whether the different views of Canadians about the different regions were significant. The same procedures which were used on the total sample will be repeated on the Canadian respondents and later on the American respondents. Table 5.16 provides a summary of all within-subjects pairwise differences and similarities. The alpha level was set at 0.005 for each test to determine how the profiles differed.

**Table 5.16 - Doubly Multivariate Analysis of Regional Differences -
Canadians view on the various regions (n=100)**

Overall Doubly Multivariate Significance p = 0.001											
Pairwise Multivariate Significance	P/R	P/O	P/C	P/B	R/O	R/C	R/B	O/C	O/B	C/B	
physical climate	P	P	P	P	R	R	R	C	B		
cost of living	R	O	C	B			R		O	C	
crime level	R	O	C		O	C	R		O	C	
housing, schooling & recreational facilities		O	C		O	C		O	O		
overall quality of life		O	C		O		R		O	C	
Factor 1: Quality of Life											
government attitude to business		P	P	P	R	R	R				
availability of govt incentives for investment	P										
regional regulatory practices											
local tax structure for business		P			R	R	R		B		
provincial/national tax structure for business					R	R	R				
national (Canada/US) regulatory practices											
Factor 2: Government/Regulation											
energy & related utility costs	R	O	C				R		O	C	
proximity to suppliers	R	P	C	P			B		B	B	
overall physical infrastructure			P								
Factor 3: General Infrastructure											
local availability of expert managers	P		P					O		B	
local availability of the right labour skills	R		P	P				O			
local availability of technical services	P	P	P	P							
Factor 4: Skills											
presence of local universities	P	P				C	B	C	B		
availability of venture capital	P	P	P	P		R			B	B	
presence of leading companies	P	P	P	P	O		B	O		B	
access to R&D facilities	P	P	P	P			B			B	
availability of suitable sites in research parks			P					O		B	
overall level of technological advancement	P	P	P	P			B			B	
Factor 5: Technology Infrastructure											
proximity to major customers and markets	P	P	P				B		B	B	
size and potential of local market	P	P	P				B		B	B	
Factor 6: Market											
proximity to large urban centres	P	P	P			C	B	C	B	B	
proximity to complementary companies	R	P	P				B			B	
Factor 7: Centrality											
labour costs	P	O	C	B			R		O	C	
industriousness of workforce											
Factor 8: Labour											
proximity to operations of our company		O	P		O	C					
Factor 9: Other											
overall assessment of region in general	P	P	P	P							
overall assessment as site for investment	P				O						
Assessment of each region											

Legend:

P= Palo Alto, R=Raleigh, B=Boston, C=CTT, O=Ottawa

Blank = No significant difference between regions

The factors are based on the analysis for the whole sample

Table 5.16 reveals that Canadians view Palo Alto more favourably on Market, Skills and Technology Infrastructure factors. However, Palo Alto is not given a good rating on Quality of life factors. Raleigh, when paired with American regions, is given a more favourable rating on Quality of life and Government/Regulation factors. Overall, when Raleigh is paired with Canadian regions, it does well on the Government/Regulation factor, however, the Canadian regions do predominantly better on Quality of life variables. Canadian respondents view labour costs more favourably in Canada than they do in the United States. When a difference was noted in the pairing between Boston and the Canadian regions, Boston did better on Market and the Technology Infrastructure, while the Canadian regions did better on Quality of life variables.

5.6.2 American respondents

To determine whether the views held by American respondents about the various regions differed, multivariate within-subjects comparisons was used. As noted earlier, the same procedures which were used on the Canadian respondents were repeated on the American respondents. The null hypothesis, that the population means for each region are equal, was rejected at $p < 0.001$. That is, an overall difference was detected indicating that Americans had significantly different attitudes towards the investment potential for each of the regions. Table 5.17 provides a summary of all within-subjects pairwise differences and similarities.

**Table 5.17 - Doubly Multivariate Analysis of Regional Differences -
Americans view on the various regions (n=64)**

Overall Doubly Multivariate Significance p = 0.001										
Pairwise Multivariate Significance	P/R	P/O	P/C	P/B	R/O	R/C	R/B	O/C	O/B	C/B
physical climate		P	P	P	R	R	R			
cost of living	R	O	C	B	R	R	R		O	
crime level	R	O	C				R		O	
housing, schooling & recreational facilities			P		R	R		O	B	B
overall quality of life			P		R	R		O		B
Factor 1: Quality of Life										
government attitude to business		P	P	P	R	R	R			
availability of govt incentives for investment	R			B	R		R			
regional regulatory practices	R				R	R	R			
local tax structure for business	R				R	R	R			
provincial/national tax structure for business	R				R	R	R			
national (Canada/US) regulatory practices					R	R	R			
Factor 2: Government/Regulation										
energy & related utility costs	R				R	R	R			
proximity to suppliers		P	P		R	R	B		B	B
overall physical infrastructure			P		R	R	R			B
Factor 3: General Infrastructure										
local availability of expert managers		P	P		R	R			B	B
local availability of the right labour skills	P	P	P		R	R			B	B
local availability of technical services		P	P		R	R			B	B
Factor 4: Skills										
presence of local universities		P	P		R	R			B	B
availability of venture capital	P	P	P		R	R	B		B	B
presence of leading companies		P	P		R	R			B	B
access to R&D facilities		P	P			R			B	B
availability of suitable sites in research parks		P	P		R	R			B	B
overall level of technological advancement		P	P		R	R			B	B
Factor 5: Technology Infrastructure										
proximity to major customers and markets		P	P		R	R			B	B
size and potential of local market		P	P		R	R			B	B
Factor 6: Market										
proximity to large urban centres	P	P	P			R	B		B	B
proximity to complementary companies		P	P		R	R			B	B
Factor 7: Centrality										
labour costs	R				R	R	R			
industriousness of workforce	R				R	R				
Factor 8: Labour										
proximity to operations of our company		P	P		R	R			B	B
Factor 9: Other										
overall assessment of region in general		P	P		R	R			B	B
overall assessment as site for investment		P	P		R	R			B	B
Assessment of each region										

Legend:

P=Palo Alto, R=Raleigh, B=Boston, C=CTT, O=Ottawa

Blank = No significant difference between regions

The factors are based on the analysis for the whole sample

Table 5.17 reveals that Americans and Canadians share different views regarding the differences that exists among the regions. When the Palo Alto, Raleigh and Boston regions were paired, the American respondents did not note a significant difference on the majority of the location variables. The differences that were noted dealt with Quality of life and Government/Regulation variables. Raleigh would receive a higher rating when paired with either Palo Alto or Boston. Americans also noted a significant difference between Raleigh and the Canadian regions on the majority of location variables, with Raleigh always rating higher than CTT or Ottawa. A significant difference was also noted between Palo Alto and Boston when paired with the Canadian regions. Cost of living and crime level were the only two variables where either Ottawa or CTT received favourable ratings. Americans did not view a significant difference between Ottawa and CTT, an indication that they had difficulty distinguishing between them.

In conclusion, the multivariate tests have indicated that the respondents do view a significant difference in their assessment of the five regions based on various location variables. Both Canadians and Americans rate Palo Alto favourably. Researchers, such as Herbig and Golden (1993) have stated that “education and access to well-endowed, prestigious and respected research institutions’ have contributed to the formation and success of Silicon Valley. The findings from this study would support the argument that these factors are continuing to contribute to the positive image of Palo Alto as the “most celebrated technological hotspot in the entire world” (Herbig and Golden 1993: p.38).

Raleigh is viewed favourably by Canadians and especially Americans. This region has received high ratings on its Government/Regulation and Quality of life factors. This supports findings from the Joint Economic Congress study (1982) which summarized the factors contributing to the success of the Research Triangle Park as follows: “a critical mass of educated and technical workers, competitive low labour costs and labour availability, park location, quality of life in North Carolina ‘sun belt’ and integrated promotion efforts.” (Herbig and Golden 1993: p.236)

Overall, the Boston region was viewed favourably by both Canadian and American respondents. Respondents noted few significant differences between Palo Alto, which received the overall highest ratings, and Boston. Boston was recognized for the presence of its major universities. This supports past studies which attribute Route 128's success to the ‘academic institutions which provided much of the momentum’ for high technology development.

The analysis indicates that Americans lack familiarity with the two Canadian regions. They were unable to note any significant differences between Ottawa and CTT when paired. However, Americans did rate Ottawa and CTT favourably on Quality of life factors. Canadian respondents also rated Ottawa and CTT favourably on these variables, as well as labour costs and energy and other related utility costs. CTT was also recognized for the presence of various recognizable universities.

Overall, the analysis provides information which distinguishes the regions based on specific location variables. The respondents were able to identify the perceived strengths and weaknesses of each region.

5.7 PERFORMANCE/IMPORTANCE INDEX

Although Table 5.14 indicates the overall rating that the regions received on each location variable, it is important to compare each region's performance on the location variables to the importance that the respondents attribute to them. This section is devoted to developing an index that reflects a region's overall ranking on the variables.

Table 5.18 provides an index which compares the importance of the variables to each region's performance. To obtain the index ratings for each region, the location importance values from Table 5.7 were multiplied with each region's performance on the location variables (See Table 5.14). The ordering of the variables is based on the factor analysis that was conducted on the importance of the location variables. The importance of the location variables and the performance of each region was obtained using interval scales. Consequently, there is no absolute zero origin. To ensure that the index is accurate for Table 5.18 and 5.19, a meaningful zero will be created by subtracting 1 from the importance and performance values.

Table 5.18 - Index of Region Performance - All respondents (n=164)

<i>location variables</i>	<i>location variable importance</i>	<i>Ottawa Perf.</i>	<i>CTT Perf.</i>	<i>Boston Perf.</i>	<i>Palo Alto Perf.</i>	<i>Raleigh Perf.</i>
Physical climate	1.9	2.3	2.9	3.4	6.3	5.1
Cost of living	2.1	4.8	4.8	3.4	2.1	5.3
Crime level	2.2	6.2	5.7	3.5	3.3	4.8
Housing, schooling facilities	2.2	5.9	5.3	5.7	5.1	5.5
Overall quality of life	2.7	7.3	6.5	5.9	6.5	7.0
Factor 1: Quality of life	2.2	26.5	25.2	22.0	23.2	27.7
Rank		2	2	4	4	1
Availability of govt incentives	1.9	3.6	3.4	3.6	3.2	4.2
National regulatory practices	2.0	3.6	3.6	4.0	4.0	4.4
Govt attitude to business and investment	2.6	5.2	4.9	5.5	6.5	6.8
Regional regulatory practices	2.0	3.8	3.6	3.8	3.8	4.6
Local tax structure for business	2.5	6.8	4.3	4.8	5.0	6.0
National tax structure for business	2.5	4.5	4.5	4.8	5.0	5.8
Factor 2- Government/Regulation	2.3	27.5	24.3	26.4	27.5	31.7
Rank		2	5	2	2	1
Energy and related utility costs	1.4	3.1	2.8	2.5	2.4	3.2
Overall physical infrastructure	2.2	5.3	4.6	5.3	5.7	5.7
Proximity to suppliers	1.6	2.7	2.7	4.0	4.5	3.0
Factor 3- General Infrastructure	1.7	11.1	10.1	11.8	12.6	12.0
Rank		4	4	1	1	1
Local availability of right labour skills	3.0	6.9	6.0	7.5	8.4	7.2
Local availability of technical services	3.0	7.5	6.3	8.4	9.3	8.1
Local availability of expert managers	2.6	6.0	4.9	7.0	7.5	6.5
Factor 4- Skills	2.9	20.4	17.2	22.9	25.2	21.8
Rank		4	5	2	1	2
Presence of leading companies	2.2	5.7	4.4	6.8	7.7	5.7
Access to R&D facilities	1.9	4.6	4.4	5.9	6.3	5.3
Presence of universities research centres	2.3	5.5	6.0	7.6	7.6	6.7
Availability of venture capital	1.4	2.5	2.4	3.8	4.2	3.1
Level of technological advancement	2.6	6.8	6.2	8.3	9.4	7.5
Availability of suitable sites	1.9	4.6	4.0	5.3	5.5	5.5
Factor 5 - Technical Infrastructure	2.1	29.6	27.4	37.7	40.6	33.8
Rank		4	5	2	1	3
Size and potential of local market	2.6	4.2	3.6	6.8	7.0	4.9
Proximity to customers and markets	3.0	5.7	5.1	8.4	8.4	6.6
Factor 6 - Market	2.8	9.9	8.7	15.2	15.4	11.5
Rank		4	4	1	1	3
Proximity to large urban centres	2.3	4.8	5.1	7.4	7.1	4.8
Proximity to competing companies	1.7	3.4	3.1	4.6	5.1	3.7
Factor 7- Centrality	2.0	8.2	8.1	12.0	12.2	8.6
Rank		3	3	1	1	3
Labour costs	1.9	4.0	4.0	2.9	2.3	4.6
Industriousness of workforce	2.5	6.0	5.8	5.5	5.8	6.3
Factor 8 - Labour	2.2	10.0	9.7	8.4	8.0	10.8
Rank		1	1	4	4	1
Proximity to existing operations	1.9	3.4	3.0	3.4	3.0	3.0
Factor 9- Other	1.9	3.4	3.0	3.4	3.0	3.0
Rank		1	2	1	2	2
TOTAL	2.2	146.6	133.7	159.8	167.7	160.9
Rank		4	5	2	1	2

The factors are based on the analysis for the whole sample n=164

Palo Alto had the highest overall rating score, closely followed by Raleigh and Boston which tied for second. Ottawa ranked fourth followed by CTT. Table 5.18 reveals which region received the highest ranking for each factor. Palo Alto received the highest ranking, and tied for first with Boston, on five factors: General Infrastructure, Skills, Technology Infrastructure, Market and Centrality. Raleigh received the highest ranking on Quality of life, and Government/Regulation factors. It also tied for first with Ottawa and CTT on the Labour factor. Ottawa came in second on the Quality of life and Labour factors. CTT ranked last on the following factors: Government/Regulation, General Infrastructure, Skills, Technical Infrastructure, Market and Centrality.

To ensure that the overall index for each region is not biased by the number of respondents from that region in the total sample, further analysis was conducted by excluding all “local” respondents from the analysis of each region. Results are presented in Table 5.19. The overall ranking of each region did not differ from that presented in Table 5.18, where all the respondents were evaluating each region, including their own. This indicates that the respondents’ place of residence is not biasing the overall results. Only the Ottawa respondents, which represent 25 percent of the overall sample, evaluated themselves more favourably on two factors: Government/Regulation and Other.

5.8 PERFORMANCE MAPPING

To provide a visual impression of the respondents’ overall assessment for each region, the overall location importance factors were plotted against the performance of those regions on

Table 5.19 - Index of Region Performance - Excluding respondents from that region

<i>location variables</i>	<i>location variable importance</i>	<i>Ottawa Index n=103</i>	<i>CTT Index n=102</i>	<i>Boston Index n=111</i>	<i>Palo Alto Index n=123</i>	<i>Raleigh Index n=113</i>
Physical climate	1.9	2.1	2.9	3.2	6.1	4.9
Cost of living	2.1	4.4	4.6	3.4	2.3	5.3
Crime level	2.2	5.9	5.5	3.1	3.3	4.6
Housing, schooling facilities	2.2	5.5	5.1	5.5	5.1	5.3
Overall quality of life	2.7	6.5	6.2	5.7	6.2	6.8
Factor 1 - Quality of Life	2.2	24.4	24.2	20.8	23.0	26.8
Rank		2	2	4	4	1
Availability of govt incentives	1.9	3.6	3.2	3.6	3.0	4.2
National regulatory practices	2.0	3.6	3.4	4.0	4.0	4.4
Govt attitude to business	2.6	5.2	4.9	5.5	6.5	6.5
Regional regulatory practices	2.0	3.6	3.6	3.8	3.8	4.6
Local tax structure for business	2.5	4.3	4.3	4.8	5.0	6.0
National tax structure for business	2.5	4.3	4.3	4.8	5.0	5.8
Factor 2 - Government/Regulation	2.3	24.5	23.7	26.4	27.3	31.4
Rank		4	4	2	2	1
Energy and related utility costs	1.4	2.9	2.8	2.5	2.4	3.1
Overall physical infrastructure	2.2	5.1	4.6	5.3	5.7	5.7
Proximity to suppliers	1.6	2.4	2.4	3.7	4.5	3.0
Factor 3 - General Infrastructure	1.7	10.4	9.8	11.5	12.6	11.8
Rank		4	4	1	1	1
Local availability of right labour skills	3.0	6.6	5.7	7.2	8.4	6.9
Local availability of technical services	3.0	7.2	6.0	8.4	9.3	7.8
Local availability of expert managers	2.6	5.7	4.7	7.0	7.5	6.5
Factor 4 - Skills	2.9	19.5	16.4	22.6	25.2	21.2
Rank		4	5	2	1	2
Presence of leading companies	2.2	5.1	4.2	6.6	7.5	5.5
Access to R&D facilities	1.9	4.4	4.2	5.7	6.3	5.1
Presence of universities	2.3	5.3	5.8	7.4	7.6	6.2
Availability of venture capital	1.4	2.4	2.2	3.6	4.1	3.1
Level of technological advancement	2.6	6.5	6.0	8.3	9.1	7.3
Availability of suitable	1.9	4.6	4.0	5.3	5.5	5.3
Factor 5 - Technology Infrastructure	2.1	28.2	26.3	36.9	40.0	32.5
Rank		4	4	2	1	3
Size and potential of local market	2.6	3.6	3.6	6.5	6.8	4.7
Proximity to customers and markets	3.0	5.1	4.8	8.1	8.1	6.3
Factor 6 - Market	2.8	8.7	8.4	14.6	14.9	11.0
Rank		4	4	1	1	3
Proximity to large urban centres	2.3	4.8	4.6	7.4	7.1	4.8
Proximity to competing companies	1.7	3.1	2.9	4.4	5.1	3.6
Factor 7 - Centrality	2.0	7.9	7.5	11.8	12.2	8.4
Rank		3	3	1	1	3
Labour costs	1.9	3.6	4.0	2.9	2.1	4.4
Industriousness of workforce	2.5	5.5	5.5	5.5	5.5	6.0
Factor 8 - Labour	2.2	9.1	9.5	8.4	7.6	10.4
Rank		1	1	4	4	1
Proximity to existing operations	1.9	2.5	2.5	2.9	2.7	2.7
Factor 9 - Other	1.9	2.5	2.5	2.9	2.7	2.7
Rank		3	3	1	1	1
TOTAL	2.2	135.3	128.4	155.9	165.5	156.3
Rank		4	5	2	1	2

The factors are based on the analysis for the whole sample, n=164

the same factors. The standardized values were plotted on a scatterplot. Charts 5.1 to 5.5 illustrate how the regions performed given the importance of these factors. To provide more detail, each region's performance on the individual variables is also presented in Appendix L. These charts reveal a region's strengths (variables in top right quadrant) and those that can be considered its weaknesses (variables in top left quadrant) concerning the factors that are seen as important.

The various charts illustrate the importance of the various location variables and how the respondents assessed these regions based upon these variables. Policy makers can work at promoting the region's strengths, as identified by the high technology respondents, and improving the identified weaknesses. Policy makers can also attempt to promote those variables on which a region performed well, but which were not considered important by high technology companies. Marketing strategies can be developed that attempt to alter high technology companies' assessment of the importance of various location variables. That is, variables that fall within the bottom right quadrant can be marketed as location variables that have been overlooked and which high technology companies should consider important when assessing the investment potential of a region. For example, a region may have performed well on 'proximity to complementary or competing companies', however, this variable did not receive a high rating by respondents (See Table 5.7). However, as noted by (Herbig and Golden 1993: p.47), "a critical mass of high-tech firms is necessary so as to provide sufficient number of companies and technical personnel that make staffing new ventures easy. In Silicon Valley it is reputed that one can switch jobs without ever changing parking spaces". Policy makers can then develop strategies that attempt to convey that this variable is important in assessing the investment potential of a region.

Chart 5.1 - Palo Alto Performance **Legend:**

1 Quality of life	4 Skills	7 Centrality
2 Government/Regulation	5 Technology Infrastructure	8 Labour
3 General Infrastructure	6 Market	9 Other

Chart 5.1 reveals that Palo Alto performs well on the Skills and Market factors. Appendix L identifies the specific variables that received a high rating. Palo Alto performed well on proximity to major customers and markets, local availability of technical services, local availability of the right labour skills, etc. Palo Alto did not perform well on Government/Regulation and Quality of life factors. Appendix L reveals that this region did not perform well on the following location variables: quality of life, local tax structure and crime level. Although Centrality and Technology Infrastructure factors did not obtain a high importance rating, Palo Alto did perform well on these two factors. Appendix L reveals that it performed well on the following location variables: overall physical infrastructure, proximity to suppliers and proximity to complementary or competing companies.

Chart 5.2 - Raleigh Performance **Legend:**

1 Quality of life	4 Skills	7 Centrality
2 Government/Regulation	5 Technology Infrastructure	8 Labour
3 General Infrastructure	6 Market	9 Other

Chart 5.2 illustrates that Raleigh performed well on the Skills factor. Referring to Appendix K, it performed extremely well on local availability of expert managers and technical services. This region also performed well on Quality of life, Government/Regulation and Labour, however, these factors did not receive as high a rating by the respondents on importance. Raleigh performed poorly on the Market factor, which was rated the second most important location factor (See Table 5.4). Appendix L reveals that respondents gave a low rating to Raleigh's performance on proximity to major customers and markets, and size and potential of local market variables.

Chart 5.3 - Boston Performance **Legend:**

1 Quality of life	4 Skills	7 Centrality
2 Government/Regulation	5 Technology Infrastructure	8 Labour
3 General Infrastructure	6 Market	9 Other

Chart 5.3 reveals that Boston performed well on two important location factors: Market and Skills. Appendix L also reveals that Boston performed well on overall level of technological advancement and presence of universities. Boston did not perform well on Government/Regulation, Quality of life and Labour factors. Specifically, it performed poorly on the following variables: government attitude to business and investment, local and national tax structure for business, overall quality of life, and industriousness of workforce. Boston did perform well on Centrality and Skills factors, however, these factors did not receive as high a rating by the respondents on importance. It performed especially well on access to R&D facilities and availability of suitable sites (See Appendix L).

Chart 5.4 - Ottawa Performance **Legend:**

1 Quality of life	4 Skills	7 Centrality
2 Government/Regulation	5 Technology Infrastructure	8 Labour
3 General Infrastructure	6 Market	9 Other

Chart 5.4 reveals that Ottawa performs well on the Skills factor, which was ranked as the most important location factor. Appendix L illustrates that Ottawa did well on availability of special design, engineering and other skills. It also performed well on Quality of life and Labour factors. Appendix L illustrates that respondents gave Ottawa a high rating on overall quality of life and industriousness of workforce variables. Ottawa also performed well on Technology Infrastructure, however, this factor did not receive a high rating by the respondents on importance. This region performed poorly on the Market factor: proximity to major customers and markets, and size and potential of local market.

Chart 5.5 - CTT Performance **Legend:**

1 Quality of life	4 Skills	7 Centrality
2 Government/Regulation	5 Technology Infrastructure	8 Labour
3 General Infrastructure	6 Market	9 Other

Chart 5.5 illustrates that CTT is another Canadian region that received a high rating on the Skills factor. Specifically, CTT performed well on the local availability of technical services variable. This reflects its high performance on the presence of universities variable (See Appendix L). CTT also performed well on Quality of Life and Labour factors. Specifically, it performed well on the industriousness of workforce and overall quality of life variables. It also performed well on Centrality, General Infrastructure and Technology Infrastructure, however, these factors did not receive as high a rating by the respondents on importance. CTT performed poorly on the Market factor. Appendix L reveals that CTT performed worst on the size and potential of local market variable.

In conclusion, the performance maps are helpful in visualizing the strengths and weaknesses of each region. They can be used to identify areas where a region's performance lags behind its competitors and work to strengthen those areas (Barich and Kotler 1991). Attempts should be made by the regions to improve upon the variables that fall in the top left quadrant. These are variables that respondents considered important when making investment decisions, yet these regions received an overall poor assessment on them. These maps provide information that is crucial when developing marketing strategies. Policy makers can also attempt to alter high technology companies' importance ratings of various location variables. If a region performed well on a variable that received a low importance rating, effort should be taken to convey that this variable is in fact necessary to high technology companies and should be considered in evaluating the investment potential of a region.

5.9 OVERALL KNOWLEDGE ABOUT THE REGIONS

Section 6 of the questionnaire examined respondents' views about the regions. Five questions were aimed at determining a respondent's overall familiarity with the various high technology centres. The responses from the complete sample are presented, followed by the responses of all the sample less those companies that are located in that region. This enables a better assessment of how the regions are viewed by external companies. The findings would indicate that the respondents are most knowledgeable about Palo Alto, and least about CTT.

Information will also be presented regarding whether the respondents would consider investing in these regions.

The information was inputted verbatim. The data was then scanned for frequently mentioned responses. Codes were developed which then enabled the data to be summarised and presented in table format (Table 5.20 - 5.24). Various terms were used to capture the underlying meaning of the responses. For instance, many respondents noted “Silicon Valley” as the first thing that came to mind when they thought of Palo Alto. This response was then placed under the category of “nickname”. The term “tech adv’t” is used to classify responses such as “fading jewel” or “leader of the pack”. Many respondents would also cite a company that currently operates in a specific region, and these responses were coded under the term “company”. The term “high tech” was used to classify all responses that dealt with technology. Many respondents would specifically mention “high technology” in response to the first three questions, however, other responses that would fall under this term included the following: concentration of software companies, centre for Information Technology, telecommunications, etc.

The ordering of the terms is in descending order as per the Ottawa region. For instance, “government” is the first thing that comes to mind when respondents thought of Ottawa. Therefore, “government” is the term that is displayed first in Table 5.20 even though it was rarely, if ever, mentioned for the other four regions.

Table 5.20 - First thing that comes to mind when respondents think of each region:**a) All respondents (n=164):**

	<i>Ottawa</i>	<i>CTT</i>	<i>Boston</i>	<i>Palo Alto</i>	<i>Raleigh</i>
Value Name	%	%	%	%	%
government	28.5	0.0	0.0	0.0	0.6
high-tech	17.6	8.4	24.8	32.7	15.7
climate	17.6	7.3	2.4	10.9	4.8
company	6.7	1.2	4.8	4.8	6.7
lifestyle	1.8	3.6	5.5	6.1	7.3
nickname	1.2	0.6	1.8	14.5	15.2
tech adv't	1.2	7.3	6.1	2.4	4.2
university	0.0	20.6	14.5	5.5	3.0
other	13.3	25.4	21.8	14.5	29.6
missing cases	12.2	24.8	17.6	7.9	17.0
	100%	100%	100%	100%	100%

b) All respondents except region's own:

	<i>Ottawa</i> <i>n = 120</i>	<i>CTT</i> <i>n = 135</i>	<i>Boston</i> <i>n = 143</i>	<i>Palo Alto</i> <i>n = 147</i>	<i>Raleigh</i> <i>n = 142</i>
Value Name	%	%	%	%	%
government	29.2	0.0	0.0	0.0	0.7
climate	20.8	8.9	2.8	12.2	4.9
high-tech	13.3	8.8	21.7	34.7	16.9
company	7.5	1.5	5.6	5.4	7.7
lifestyle	1.7	4.4	5.6	6.1	6.3
nickname	0.8	0.0	2.1	13.6	13.4
tech adv't	0.8	5.2	7.0	2.7	4.9
university	0.0	20.7	14.0	3.4	2.1
other	15.0	22.9	23.1	13.7	25.3
missing cases	10.8	27.4	18.2	6.8	17.6
	100%	100%	100%	100%	100%

Table 5.20 reveals the first thought that comes to the mind of the respondents when they think of each region. A large number of respondents associated issues regarding 'high technology' to the American regions: Palo Alto, Boston and Raleigh. Of the responses that the Palo Alto region received, 32.7% dealt with high technology issues. For instance, respondents would note that this region was the "software Mecca of the world" and that it is "the leader in high technology". Many respondents had mentioned MIT and Harvard when considering the Boston region. Of the responses that the CTT region received, 20.6% also dealt with universities, specifically the University of Waterloo. Not surprisingly, the respondents associated 'government' to the Ottawa region. Many respondents mentioned that this city is the capital of Canada and that the Parliament is located here. A large number of respondents had also associated responses that fall under the category of "high tech" to this region. For example, the first thought that came to the mind of some respondents when they thought of the Ottawa region was "telecommunications".

Observing the number of missing cases is indicative of a lack of familiarity with the regions. Many respondents, 24.8%, were unable to supply a response for the CTT region. A number of respondents had written on the questionnaire that they did know enough about this region and that they did not even know where it was located. Raleigh and Boston also received a large number of missing cases. However, the majority of respondents were able to supply a response for the Palo Alto region.

Table 5.20b presents a more indicative reflection of how the regions are perceived by others. Surprisingly, the findings from both tables are to some extent comparable. This indicates that the respondents from other regions share similar views to those respondents currently located in that region. However, there are some notable differences between the two tables. For instance, Table 5.20b reveals that respondents from other regions associated the term “high tech” less frequently to Ottawa and Boston. This would indicate that companies currently located in these two regions perceive their region as being more ‘high tech’. Conversely, respondents from other regions associated the term “high tech” more frequently to Palo Alto and Raleigh. Consequently, external companies view these two regions more favourably from a “high-tech/technology” standpoint. Table 5.20b also reveals that the first thought that came to many external companies, about the various regions, related to “climate”. Many respondents would mention “snow” or “cold” when they thought of Ottawa, while other respondents would mention “sunny” or “palm trees” when considering Palo Alto. It would appear that companies place less emphasis on climate when they are currently located in a region.

Table 5.21a asked respondents to mention the single most distinguishing feature of each region in general. A large number of respondents associated ‘government’ to the Ottawa region, followed by ‘climate’ and ‘high technology’. Many respondents mentioned the University of Waterloo in CTT, and MIT and Harvard for the Boston region. Raleigh was noted for its quality of life. A large number of respondents had mentioned climate and overall

Table 5.21 - “Single most distinguishing feature of each region in general”:**a) All respondents (n=164):**

	<i>Ottawa</i>	<i>CTT</i>	<i>Boston</i>	<i>PaloAlto</i>	<i>Raleigh</i>
Value Name	%	%	%	%	%
government	27.3	0.0	0.0	0.0	1.2
high-tech	10.9	4.8	14.5	23.0	8.5
climate	9.1	4.8	1.8	19.4	7.9
lifestyle	6.1	5.5	6.1	6.1	11.5
tech adv't	3.1	9.1	5.5	4.8	4.2
university	0.0	18.8	14.5	3.6	9.1
nickname	0.0	0.0	0.6	4.8	4.8
other	13.3	18.1	27.2	18.8	18.1
missing cases	29.1	38.2	28.5	17.6	33.9
	100%	100%	100%	100%	100%

b) All respondents except region's own:

	<i>Ottawa</i> <i>n=120</i>	<i>CTT</i> <i>n=135</i>	<i>Boston</i> <i>n=143</i>	<i>PaloAlto</i> <i>n=147</i>	<i>Raleigh</i> <i>n=142</i>
Value Name	%	%	%	%	%
government	30.0	0.0	0.0	0.0	1.4
climate	10.8	5.9	2.1	20.4	7.0
high-tech	5.8	3.7	13.3	23.8	6.3
lifestyle	4.2	4.4	5.6	6.8	10.6
tech adv't	3.3	7.4	6.3	5.4	4.2
university	0.0	17.0	12.6	2.7	7.0
nickname	0.0	0.0	0.7	5.4	4.9
other	11.7	14.8	20.3	8.8	10.6
missing cases	28.3	43.0	29.4	17.0	36.6
	100%	100%	100%	100%	100%

lifestyle as the overall most distinguishing feature for Raleigh. Some respondents had referred to this region as “laid back” and “lazy south”. The most important distinguishing features of Palo Alto included its warm climate and the high concentration of high technology companies located in this region. Some respondents would note that this region was the leader in software.

Table 5.21b reveals similar findings, again indicating that the respondents share similar views of the regions, regardless of where they are located. However, slight differences can be detected between Tables 5.21 a & b. For instance, Table 5.21b reveals that external companies are less familiar with the quality of life within the various regions. When responses from companies located in Ottawa were included in the analysis, “lifestyle” was mentioned 6.1% of the time. However, when companies from Ottawa were excluded from the analysis, “quality of life” was less frequently mentioned. This table also reveals that respondents are more familiar with the universities located in their region. CTT, Boston, Raleigh and Palo Alto are recognized for the presence of various well-known universities. Many respondents would cite the “great” universities located in these regions. However, when a region’s own respondents are removed from the analysis, the presence of universities was less frequently cited. This table also reveals that many external companies did not consider “high tech” to be the most distinguishing feature of the Ottawa region. The percentage of responses associated with “high tech” almost halved when Ottawa respondents were removed from the analysis. This would indicate that external companies are not as familiar with the high tech industry in this area.

Respondents were asked to mention the most important distinguishing feature of each region specifically from the technology standpoint. Results are presented in Table 5.22a and 5.22b. The results from these tables indicate that CTT and Boston are recognized for the presence of world renowned universities. Although CTT had the highest number of missing cases, those respondents that did supply a response referred to the presence of the University of Waterloo. For instance, one respondent cited that the “University of Waterloo is #1 in Canada for computing”. Many respondents mentioned that “access to universities” and “intellectual capital” was the most distinguishing feature, from a technology standpoint, for the Boston region. A large number of respondents were also able to name companies that are currently located in the Ottawa region.

However, Table 5.22b reveals that when respondents from Ottawa are removed from the analysis, fewer external companies mentioned the presence of companies based in Ottawa. Palo Alto was acknowledged for the large concentration of high technology companies that currently reside in this area. This region has a “critical mass of high technology companies” and it is “a source of software and engineers.” Many respondents also mentioned that it was the leader with regards to overall technological advancement. Raleigh was recognized for the presence of Nortel in its Research Triangle Park. Overall, a substantial number of responses, ranging from 24.5% to 60.7%, were not provided. This would indicate a lack of familiarity, from the technology standpoint, for each region by the respondents.

Table 5.22 - “Single most important distinguishing feature of each region specifically from the technology standpoint”:

a) All respondents (n=164):

	<i>Ottawa</i>	<i>CTT</i>	<i>Boston</i>	<i>PaloAlto</i>	<i>Raleigh</i>
Value Name	%	%	%	%	%
company presence	10.3	1.2	3.6	5.5	7.3
high-tech	10.3	7.9	10.3	17.0	9.0
telecom	6.7	0.0	1.2	0.0	3.6
software	6.1	2.4	2.4	7.3	3.6
government	5.5	0.0	0.6	0.0	0.0
labour	4.2	7.9	7.3	7.9	6.1
tech adv't	3.6	1.8	5.5	10.9	5.5
university	0.6	18.8	18.2	8.5	5.5
nickname	0.6	0.0	0.6	4.8	5.5
other	4.2	4.2	9.6	12.6	10.3
missing cases	47.3	55.2	40.0	24.2	42.4
	100%	100%	100%	100%	100%

b) All respondents less region's own:

	<i>Ottawa</i> n=120	<i>CTT</i> n=135	<i>Boston</i> n=143	<i>PaloAlto</i> n=147	<i>Raleigh</i> n=142
Value Name	%	%	%	%	%
high-tech	10.0	6.6	11.2	17.0	7.7
company presence	7.5	1.5	3.5	4.8	8.5
software	6.7	2.2	2.8	7.5	3.5
government	5.0	0.0	0.7	0.0	0.0
tech adv't	4.2	1.5	6.3	11.6	4.2
labour	4.2	8.9	6.3	8.2	6.3
telecom	3.3	0.0	0.7	0.0	3.5
university	0.8	15.6	16.1	8.8	4.9
nickname	0.0	0.0	0.7	4.8	4.9
other	5.0	3.0	9.8	8.1	11.3
missing cases	53.3	60.7	42.0	24.5	44.4
	100%	100%	100%	100%	100%

Respondents were asked to list three of four companies that have headquarters in each region. Companies that were mentioned by 5% or more of the respondents are presented in Table 5.23. The most frequently mentioned companies in the Ottawa region are as follows: Corel, Nortel, Newbridge, Mitel and Cognos. Corel, which employs around 550 employees, was mentioned more frequently than Nortel which employs over 6000 employees in this region and which has their R&D headquarters here. This would indicate that Corel has successfully marketed itself to areas beyond this region.

The two most frequently mentioned companies in CTT are Open Text Corporation and NCR. However, the headquarters for NCR is not located in the CTT region. Respondents had difficulty mentioning companies that have headquarters in this region.

Respondents had little difficulty in listing companies that have headquarters located in Palo Alto. Hewlett-Packard, Apple and Sun Microsystems were the most frequently mentioned companies. Overall, the respondents accurately named companies located in this region.

Digital, Raytheon, Lotus and Data General were frequently mentioned as having their headquarters located in the Boston region. All four of these companies are located along Route 128, indicating that respondents are familiar with the companies in this region.

The three most frequently mentioned headquarters for Raleigh are as follows: Nortel, Glaxo Welcome Inc. and IBM. Of these companies, only Glaxo-Welcome Inc. has its headquarters located in this region. This indicates that the respondents are not very familiar with the companies located in this region. Although Nortel has a large presence in the Research Triangle Park, its corporate headquarters are currently located in Brampton, Ontario.

Table 5.23- “High technology companies known to have headquarters in each region”.

*The cutoff point has been set at a minimum 5% of the respondent`s mentioning a company name

All respondents n=164			All respondents less companies in Ottawa n=120	
<i>Ottawa companies*</i>	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
Corel	62	25.6	42	33.6
Newbridge	51	21.1	21	16.8
Nortel	46	19.0	25	20.0
Mitel	30	12.4	12	9.6
Cognos	21	8.7	9	7.2
Other (13 other companies were mentioned by the complete sample. 5 by sample not in region)	32	13.2	16	12.8

All respondents n=164			All respondents less companies in CTT n=135	
<i>CTT companies*</i>	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
Opentext Corporation	12	15.0	4	12.9
Waterloo Maple Software	7	8.8	1	3.2
ComDev	6	7.5	3	9.7
NCR	5	6.3	4	12.9
MKS	4	5.0	-	-
Other (30 other companies were mentioned by whole sample, 4 by sample not in region)	46	57.5	19	61.3

All respondents
n=164

All respondents less
companies in Boston
n=143

<i>Boston companies*</i>	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
Digital Equipment	70	35.9	56	40.5
Lotus	15	7.7	9	6.5
Data General	14	7.2	9	6.5
Raytheon	12	6.2	10	7.3
Other (22 other companies were mentioned by complete sample. 16 by sample not in region)	84	43.1	54	39.1

All respondents
n=164

All respondents less
companies in Palo Alto
n=147

<i>Palo Alto companies*</i>	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
Hewlett Packard	55	18.1	46	18.0
Apple	40	13.2	34	13.3
Sun	37	12.2	33	12.8
Intel	29	9.5	21	8.2
Oracle	20	6.6	19	7.4
Netscape	19	6.2	14	5.5
Other (35 other companies were mentioned by complete sample. 25 by sample not in region)	104	33.7	123	48.0

All respondents
n=164

All respondents less
companies in Raleigh
n=143

<i>Raleigh companies*</i>	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
Nortel	29	31.5	25	37.3
IBM	21	22.8	14	20.9
Glaxo-Welcome Inc.	9	9.8	3	4.5
Other (21 other companies were mentioned, 15 by sample not in region)	33	35.9	25	37.3

A respondent's ability to accurately list companies that are located in the various regions indicates a greater familiarity with these regions. It would appear that the respondents are familiar with the Ottawa, Boston and Palo Alto regions. However, the respondents were less familiar with the CTT and Raleigh areas.

The respondents were also asked if they were aware of any nicknames that were associated with the various regions. Frequencies were obtained to determine whether respondents, less respondents from that region, were able to cite any nicknames. Results are presented in Table 5.24. Respondents had greater success in recalling nicknames for the Palo Alto region. The most frequently mentioned nickname was Silicon Valley. Other nicknames that were mentioned included: Bay Area, The Valley, Left coast and "wine country". The large number of responses indicates a high degree of familiarity with this region.

Many respondents were also able to identify a nickname to the Raleigh region: The Research Triangle Park. Other less frequently mentioned nicknames are as follows: Golden Triangle, Hurricane Alley and Silicon Valley South.

The most frequently mentioned nickname for Boston was Route 128. However, numerous other nicknames were also mentioned. They include: Software Haven, Tech Circle, Electric Highway, Golden Mile, Beltway, Massachusetts Miracle, The Ring and Silicon Valley East. The lack of consensus among the respondents would indicate that policy makers have not actively sought to associate a specific nickname to this region.

Silicon Valley North was the most frequently mentioned nickname for the Ottawa region by respondents located in other high technology centres. Other nicknames that were mentioned included: The Capital and Canada's Silicon Valley.

The respondents had the greatest difficulty in recalling a nickname for the CTT region. Four respondents were able to cite The Golden Triangle. Only one respondent was able to identify this region as Canada's Technology Triangle (CTT).

Overall, many of the respondents had difficulty in identifying 'nicknames' for the Raleigh, Boston, Ottawa and CTT region. Respondents had the least difficulty in associating the nickname Silicon Valley to the Palo Alto region. This would indicate that respondents are more familiar with this region than with the others in the sample.

Table 5.24 - Most frequently mentioned nicknames

<i>Most recently mentioned nickname for each region</i>	<i>All respondents (n=164)</i>		<i>All respondents less respondents from that region</i>	
	<i>Frequency</i>	<i>Percent of responses</i>	<i>Frequency</i>	<i>Percent of responses</i>
Palo Alto - Silicon Valley	81	91.0	67	93.1
Boston - Route 128	17	58.6	13	52.2
Raleigh - Research Triangle Park	39	84.7	32	88.9
Ottawa - Silicon Valley North	35	79.5	14	73.7
CTT - golden triangle	8	38.1	4	44.4

The final question to this section of the survey dealt with whether or not the respondent/firm would consider any of the regions for new investment. Table 5.25 reveals the results. The data is presented in percentage format, with "yes" indicating that a company would consider

that region for new investment and “no” the company would not consider that region for new investment. Not surprisingly, over half of the respondents, not currently located in Palo Alto, would consider this region as a site for investment. Boston and Raleigh tied for second, followed by Ottawa and then CTT. This reaffirms each region’s overall performance on the location variables (See Table 5.14). In other words, respondents will invest in those regions that received high ratings on the location variables that high technology companies consider to be important.

Table 5.25 - “Would you invest?”

<i>Region</i>	<i>All respondents n=164</i>		<i>All respondents less respondents from that region</i>	
	<i>yes (%)</i>	<i>no (%)</i>	<i>yes (%)</i>	<i>no (%)</i>
Palo Alto	54.1	45.9	52.9	47.1
Boston	41.7	58.3	36.0	64.0
Raleigh	39.4	60.6	35.8	64.2
Ottawa	29.0	71.0	20.2	79.8
CTT	22.7	77.3	15.7	84.3

In conclusion, this section of the questionnaire has revealed that respondents are familiar with the Palo Alto region. Respondents were able to correctly identify relevant nicknames and companies. As well, the impressions that respondents had of this region were linked to high technology and overall technological advancement. Over half of the respondents located outside of this region would consider Palo Alto as a site for new investment.

There did not exist a great deal of consensus among the respondents about Raleigh. Numerous impressions were mentioned, however, no main view was identified for this region.

Although Raleigh received an overall high ranking on its performance of location variables, the response from this section would indicate a lack of familiarity by the respondents. For instance, respondents had difficulty identifying companies located in this region.

Overall, the respondents revealed a substantial amount of knowledge about the Boston region. Relevant companies and nicknames were identified. As well, the respondents frequently mentioned the presence of MIT and Harvard. Some of the respondents in the section had noted that Boston was a 'fading jewel' or that it had "lost out to Palo Alto". In other words, that it lacks the overall technological advancement that it was once recognized for. This is revealed in Table 5.25 where a larger percentage of respondents would consider investing in Palo Alto. Respondents gave Boston the second highest rating as a site for new investment.

It would appear that the first impression that respondents have of the Ottawa region is that of a government town. Likewise, many respondents focused on the poor climate in this region. However, many respondents are aware of high technology companies located in this region. This was revealed in Table 5.25, where they were able to correctly identify appropriate headquarters. However, only 20.2% of the respondents located outside of this region would consider this region as a site for investment.

The main impression that respondents had of the CTT region was the presence of the University of Waterloo. Respondents did not associate many other thoughts to this region. Overall, most respondents demonstrated their lack of familiarity with this region by failing to provide relevant companies with headquarters in this region and relevant nicknames.

5.10 THE OVERALL IMAGE OF THE OTTAWA REGION

This section is devoted towards discussion and elaboration on the image that this region holds in the eyes of high technology companies. The overall performance of this region will be viewed from the standpoint of various audiences: Ottawa based companies, All respondents, All respondents less Ottawa based companies, All Canadians, Canadians less Ottawa respondents and All Americans. Analysis will also be conducted to determine whether the size of a company influences how the Ottawa region is viewed as an area for potential investment.

The performance of the Ottawa region on various location variables is presented in Table 5.26. The types of respondent's mentioned above are evaluating Ottawa's overall performance. This table reveals that Ottawa respondents gave the highest overall ranking to this region. Respondents located in this region rated Ottawa favourably on the majority of variables. The quality of life variable received the highest rating. Other variables that received high ratings are as follows: crime level, housing and schooling facilities, presence of leading companies and entrepreneurs, and proximity to existing operations of the company.

The total Canadian sample gave the second highest overall ranking to the Ottawa region. This is not surprising given that half of this sample is comprised of Ottawa based respondents. Canadians, less Ottawa respondents, gave the third highest rating followed by: all respondents, all respondents less Ottawa based companies, and all Americans.

Of all the respondents rating Ottawa, the Americans rated it poorly on the majority of variables. This is indicative of their lack of familiarity with this region. Ottawa based companies have rated this region favourably on the skills, labour and technical orientation factors. However, Americans rated these factors poorly. They appeared unaware of the

Table 5.26 - Index of location variable importance and Ottawa performance

Evaluation of Ottawa by All respondents, All respondents less Ottawa, Ottawa, All Canadians, All Canadians less Ottawa, and All Americans

<i>location variables</i>	<i>Importance</i>	<i>All respondents n=164</i>	<i>All respondents less Ottawa n=123</i>	<i>Americans respondents n=50</i>	<i>All Canadians n=89</i>	<i>All Canadians less Ottawa n=53</i>	<i>Ottawa respondents n=35</i>
Physical climate	2.9	2.3	2.1	1.9	2.7	2.5	2.9
Cost of living	3.1	4.8	4.4	4.2	5.0	4.6	5.7
Crime level	3.2	6.2	5.9	5.3	6.6	6.4	6.8
Housing, schooling facilities	3.2	5.9	5.5	4.8	6.4	6.2	6.6
Overall quality of life	3.7	7.3	6.5	5.9	7.8	7.0	9.2
Factor 1 - Quality of life	3.2	26.5	24.4	22.2	28.5	26.7	31.1
Rank		3	3	6	2	3	1
Availability of govt incentives	2.9	3.6	3.6	3.0	3.8	4.0	3.8
National regulatory practices	3.0	3.6	3.4	3.2	3.8	3.8	4.0
Govt attitude to business	3.6	5.2	5.2	4.7	5.5	5.5	5.2
Regional regulatory practices	3.0	3.8	3.6	3.6	3.8	3.8	3.8
Local tax structure for business	3.5	6.8	4.3	4.3	4.3	4.3	4.3
National tax structure for business	3.5	4.5	4.3	4.3	4.5	4.5	4.8
Factor 2 - Government/Regulation	3.2	27.5	24.3	23.0	25.6	25.8	25.8
Rank		1	5	5	2	2	2
Energy and related utility costs	2.4	3.1	2.9	2.7	3.4	3.2	3.5
Overall physical infrastructure	3.2	5.3	5.1	4.6	5.5	5.3	5.9
Proximity to suppliers	2.6	2.7	2.4	2.1	3.0	2.7	3.4
Factor 3 - General Infrastructure	2.7	11.1	10.4	9.4	11.9	11.2	12.8
Rank		1	5	5	1	1	1
Local availability of right labour skills	4.0	6.9	6.6	5.4	7.5	7.5	7.8
Local availability of technical services	4.0	7.5	7.2	6.0	8.1	8.4	7.8
Local availability of expert managers	3.6	6.0	5.7	4.7	6.5	6.5	6.5
Factor 4 - Skills	3.9	20.4	19.5	16.1	22.1	22.4	22.1
Rank		4	4	6	1	1	1
Presence of leading companies	3.2	5.7	5.1	4.2	6.4	6.2	7.0
Access to R&D facilities	2.9	4.6	4.4	3.4	5.1	5.1	5.3
Presence universities	3.3	5.5	5.3	5.1	5.8	5.8	5.8
Availability of venture capital	2.4	2.5	2.4	2.1	2.8	2.8	2.9
Level of technological advancement	3.6	6.8	6.5	5.7	7.5	7.3	7.8
Availability of suitable sites	2.9	4.6	4.6	3.8	5.1	5.3	4.9
Factor 5 - Technology Infrastructure	3.0	29.6	28.2	24.3	32.7	32.4	33.8
Rank		4	4	6	1	1	1
Size and potential of local market	3.6	4.2	3.6	3.6	4.7	3.6	5.7
Proximity to customers and markets	4.0	3.8	3.4	3.2	4.2	3.6	5.0
Factor 6 - Market	3.8	8.0	7.0	6.8	8.9	7.2	10.7
Rank		2	4	4	2	4	1
Proximity to large urban centres	3.3	4.8	4.8	4.6	5.1	4.8	5.3
Proximity to competing companies	2.7	3.4	3.1	2.6	4.1	3.6	4.6
Factor 7 - Centrality	3.0	8.2	7.9	7.2	9.1	8.4	9.9
Rank		3	3	3	1	3	1
Labour costs	2.9	4.0	3.6	3.4	4.4	4.0	4.8
Industriousness of workforce	3.5	6.0	5.5	5.5	6.3	5.8	7.0
Factor 8 - Labour	3.2	10.0	9.1	8.9	10.6	9.7	11.8
Rank		1	5	5	1	1	1
Proximity to existing operations	2.9	3.4	2.5	1.5	4.4	3.4	6.1
Factor 9 - Other	2.9	3.4	2.5	1.5	4.4	3.4	6.1
Rank		3	6	3	2	3	1
TOTAL	3.2	144.6	133.4	119.3	153.9	147.3	164.1
Rank		3	5	5	2	3	1

The factors are based on the analysis for the whole sample, n=164

presence of leading companies, i.e. Corel, Nortel, Newbridge. This indicates that the respondents who were able to cite companies that are located in Ottawa (results are presented in Table 5.23), were more likely to have been Canadians rather than Americans. Americans also rated labour costs, and energy and related utility costs, poorly. However, a recent study by KPMG Canada ranked Ottawa “sixth out of 13 on a list of the least expensive Canadian cities in which to do business” (Ottawa Business Journal, May 26, 1997, p.4).

Table 5.27 provides an index which compares the importance of the location variables to Ottawa performance. As noted earlier, the importance of the location variables and the performance of each region was obtained using interval scales. Consequently, there is no absolute zero origin. To ensure that the index is accurate for Table 5.27, a meaningful zero will be created by subtracting 1 from the importance and performance values. The ordering of the variables is based on the factor analysis that was conducted on the importance of the location variables. The overall ranking for the Ottawa region by the various respondents is as follows: Ottawa based companies, All Canadians, Canadians less Ottawa respondents, All respondents, All respondents less Ottawa, and All Americans. The specific variables that Ottawa companies rated favourably, and which received a high importance rating by all respondents, are in descending order as follows: quality of life, local availability of technical services, overall level of technological advancement, proximity to major customers and markets, and local availability of right labour skills. Recently, Northern Telecom announced a \$250 million investment in Ottawa, which will create 5,000 jobs. When Mr. Roth, the Chief Operating Officer for Nortel, was asked why this region was selected over other North American sites the following factors were cited: presence of local engineers that have already proved they can develop products competitively, Canadian government free-trade policies, and the deciding factor was the quality of life in this region. “It’s a great place for employees

Table 5.27 - Index of location variable importance and Ottawa performance

Evaluation of Ottawa by All respondents, All respondents less Ottawa, Ottawa, All Canadians, All Canadians less Ottawa, and All Americans

<i>location variables</i>	<i>Importance</i>	<i>All respondents n=164</i>	<i>All respondents less Ottawa n=123</i>	<i>Americans respondents n=50</i>	<i>All Canadians n=89</i>	<i>All Canadians less Ottawa n=53</i>	<i>Ottawa respondents n=55</i>
Physical climate	2.9	6.5	6.2	5.8	6.9	6.6	7.3
Cost of living	3.1	10.1	9.6	9.3	10.5	10.0	11.3
Crime level	3.2	12.2	11.8	11.0	12.9	12.6	13.3
Housing, schooling facilities	3.2	11.5	11.0	10.1	12.3	12.0	12.7
Overall quality of life	3.7	13.5	12.7	11.9	14.6	13.4	16.2
Factor 1 - Quality of life	3.2	53.8	51.3	48.1	57.2	54.6	60.8
Rank		3	3	6	2	3	1
Availability of govt incentives	2.9	8.4	8.3	7.6	8.8	8.9	8.7
National regulatory practices	3.0	8.4	8.0	7.8	8.7	8.7	8.7
Govt attitude to business	3.6	10.7	10.6	10.0	11.0	11.2	10.8
Regional regulatory practices	3.0	8.4	8.3	8.1	8.6	8.6	8.5
Local tax structure for business	3.5	13.0	9.5	9.5	9.4	9.4	9.3
National tax structure for business	3.5	9.6	9.4	9.2	9.7	9.6	9.9
Factor 2 - Government/Regulation	3.2	58.4	54.2	52.3	56.3	56.4	56.0
Rank		1	5	5	2	2	2
Energy and related utility costs	2.4	7.8	7.5	6.9	8.2	7.9	8.5
Overall physical infrastructure	3.2	10.8	10.4	9.8	11.3	11.0	11.8
Proximity to suppliers	2.6	6.9	6.5	6.0	7.5	7.0	8.0
Factor 3 - General Infrastructure	2.7	25.5	24.4	22.7	27.0	26.0	28.3
Rank		1	5	5	1	1	1
Local availability of right labour skills	4.0	12.9	12.5	11.3	13.9	13.8	14.1
Local availability of technical services	4.0	13.9	13.6	12.0	14.9	15.2	14.5
Local availability of expert managers	3.6	11.8	11.5	10.3	12.7	12.8	12.6
Factor 4 - Skills	3.9	38.6	37.6	33.6	41.5	41.7	41.2
Rank		4	4	6	1	1	1
Presence of leading companies	3.2	11.4	10.7	9.3	12.6	12.2	13.3
Access to R&D facilities	2.9	9.9	9.5	8.2	10.9	10.7	11.1
Presence universities	3.3	11.0	10.9	10.4	11.3	11.3	11.4
Availability of venture capital	2.4	6.6	6.3	5.8	7.0	7.0	7.2
Level of technological advancement	3.6	13.0	12.6	11.4	14.0	13.8	14.4
Availability of suitable sites	2.9	9.7	9.5	8.4	10.5	10.7	10.3
Factor 5 - Technology Infrastructure	3.0	61.6	59.5	53.5	66.4	65.6	67.8
Rank		4	4	6	1	1	1
Size and potential of local market	3.6	9.5	8.8	8.7	10.0	8.9	11.5
Proximity to customers and markets	4.0	11.7	10.8	10.4	12.4	11.1	14.2
Factor 6 - Market	3.8	21.3	19.6	19.0	22.4	20.0	25.7
Rank		2	4	4	2	4	1
Proximity to large urban centres	3.3	10.1	10.0	9.8	10.3	10.1	10.6
Proximity to competing companies	2.7	8.1	7.4	6.5	8.9	8.2	9.9
Factor 7 - Centrality	3.0	18.2	17.3	16.4	19.2	18.3	20.5
Rank		3	3	3	1	3	1
Labour costs	2.9	9.0	8.6	8.1	9.5	9.1	10.3
Industriousness of workforce	3.5	11.9	11.4	11.2	12.4	11.8	13.2
Factor 8 - Labour	3.2	21.0	20.0	19.3	21.9	20.8	23.5
Rank		1	5	5	1	1	1
Proximity to existing operations	2.9	8.0	6.6	5.2	9.6	7.9	12.0
Factor 9 - Other	2.9	8.0	6.6	8.0	9.6	7.9	12.0
Rank		3	6	3	2	3	1
TOTAL	3.2	306.4	290.5	272.8	321.5	311.4	335.9
Rank		3	5	5	2	3	1

The factors are based on the analysis for the whole sample

to live. The quality of life in the national capital region is a superb asset for recruiting perspective staff”(Ottawa Citizen, June 7, 1997 p.E3).

Table 5.27 also reveals that other Canadian respondents rated Ottawa favourably on government/regulation and skills factors. Discriminant analysis was performed to determine whether there was a significance between Ottawa, other Canadians and American respondents. The p-values indicated that these three groups did significantly differ at the 0.05 level. Appendix M provides the results of the pairwise multivariate tests. Various t-tests were run to determine which variables contributed to each of the significant pairwise group differences. Appendix M reveals that when a significant difference was noted between Ottawa and other Canadians or Ottawa and all Americans, Ottawa respondents gave the higher rating. When a significant difference was noted between other Canadians and all Americans, other Canadian respondents gave the higher rating.

Further analysis was conducted to determine whether there was a significant difference between company size and Ottawa performance. Results are presented in Table 5.28. Discriminant analysis was performed to determine whether there was a significance between different sized companies and their evaluation of Ottawa's performance on location variables. Appendix N provides the results of the pairwise multivariate tests. The p-values indicated that these three groups did not significantly differ at the 0.05 level. This would indicate to policy makers in the Ottawa region that they can develop marketing strategies that emphasize this region's strengths without having to customize them for different sized companies.

Table 5.28 - Means of Location Variables for Ottawa - by Company Size

Importance	<\$10M	\$10-\$50M	>\$50M
PART A: Significant factors with variable loadings of 0.5 or higher			
Physical climate	2.16	2.24	2.35
Cost of living	3.18	3.40	3.20
Crime level	3.92	3.76	3.69
Housing, schooling & recreational facilities	3.73	3.51	3.62
Overall quality of life	<u>3.80</u>	<u>3.51</u>	<u>3.62</u>
Factor 1: Quality of life	3.36	3.28	3.30
Government attitude to business & investment	2.90	2.93	3.02
Availability of government incentives for investment	2.96	2.75	2.93
National regulatory practices	3.00	2.73	2.74
Regional regulatory practices	3.00	2.70	2.82
Local tax structure for business	2.63	2.57	2.80
Provincial/national tax structure for business	<u>2.75</u>	<u>2.66</u>	<u>2.80</u>
Factor 2: Government/Regulation	2.87	2.72	2.85
Energy and related utility costs	3.22	3.25	3.18
Overall physical infrastructure	3.35	3.36	3.37
Proximity to suppliers	<u>2.60</u>	<u>2.60</u>	<u>2.72</u>
Factor 3: General Infrastructure	3.06	3.07	3.09
Local availability of the right labour skills	3.27	3.38	3.11
Local availability of technical & professional services	3.57	3.49	3.28
Local availability of expert managers	<u>3.37</u>	<u>3.36</u>	<u>3.02</u>
Factor 4: Skills	3.40	3.41	3.14
Presence of leading companies or entrepreneurs	3.65	3.62	3.39
Access to R&D facilities	3.49	3.44	3.22
Presence of universities & industry research centres	3.37	3.27	3.37
Availability of venture capital	2.84	2.76	2.73
Overall level of technological advancement	3.65	3.64	3.59
Availability of suitable sites in research parks	<u>3.57</u>	<u>3.42</u>	<u>3.27</u>
Factor 5: Technology Infrastructure	3.43	3.36	3.26
Size and potential of local market	2.47	2.69	2.63
Proximity to major customers and markets	<u>2.75</u>	<u>3.11</u>	<u>2.80</u>
Factor 6: Market	2.61	2.90	2.72
Proximity to large urban centres	3.12	2.93	3.20
Proximity to complementary or competing companies	<u>2.94</u>	<u>2.87</u>	<u>3.07</u>
Factor 7: Centrality	3.03	2.90	3.14
PART B: Other factors with a loading of 0.4			
Labour costs	3.06	3.20	3.13
Industriousness of the work force	<u>3.35</u>	<u>3.31</u>	<u>3.49</u>
Factor 8: Labour	3.21	3.26	3.31
Proximity to other existing operations	<u>2.75</u>	<u>3.09</u>	<u>2.48</u>
Factor 9: Other	2.75	3.09	2.48

Bold = ratings ≥ 3 on a scale of 1 to 5, where 1 = not important at all to 5 = very important.
The factors are based on the analysis for the whole sample. $n=164$.

In conclusion, the information gathered from this analysis should assist policy makers in developing appropriate marketing strategies. As noted in the literature review, it is important to determine a place's image. The overall assessment of this region provides this information to policy makers (See Appendix L). This information should be used by policy makers to identify key areas where its performance lags behind its competitors and work to strengthen those areas. For instance, Ottawa received the lowest rating on local tax structure for business (Table 5.14). Policy makers should consider improving this location variable and conveying this change to its target audience. They should also capitalize on those areas where it outshines its competitors by stressing and building upon those strengths. (Barich and Kotler 1991). The deciding factor for Nortel's recent decision to invest \$250 million dollars was this region's overall quality of life. This is a key area which policy makers should emphasize when marketing this area to high technology companies, especially to American high technology companies which rated Raleigh favourably on the quality of life factor.

Overall, Ottawa is perceived very favourably by companies that are currently located in this area. Greater effort must be taken to convey the image that this region is ideal for investment by high technology companies. Likewise, greater effort should be taken by policy makers to distinguish this region from CTT and other Canadian cities. Table 5.13 indicated that American respondents were unable to distinguish between the two Canadian regions in this study.

6. LIMITATIONS OF THE STUDY

As with most mail surveys, this study has a non-response bias. It can be argued that the respondents who did not complete the survey may have held different views about the regions. However, given the overall demographics of this study, it would appear that a representative sample of different sized companies (according to sales or # of employees) from the hardware, software and telecommunication sectors responded to this survey. As well, the actual number of respondents (n=164) is higher than in most comparable studies (Jobber and Sanderson 1985, Chawla, Balakrishnan and Smith 1992). As noted earlier, high technology companies are of high and current interest among researchers and this factor influences response rates in industrial surveys.

Another limitation to this study is the reliability of the directories that were obtained. For instance, the Raleigh directories failed to provide information about company sales and number of employees. Consequently, appropriate cut-off points could not be used for this region. Likewise, many of the directories did not supply comprehensive lists of companies for various regions. Some directories did not provide more than 100 company names. Therefore, one could argue that the representativeness of the sample, for various regions, may be questionable. However, when a directory appeared to be incomplete various other sources were considered and used to supplement the original company list. These included national directories, business magazines, appropriate sites on the Internet, Chambers of Commerce, etc..

Another potential limitation to this study was respondents giving their region an overall positive rating because they did not want their region to appear inferior. However, the results of the study have indicated that respondents from other regions shared similar views to those of local companies currently located in a specific region.

A final limitation to this study is the effectiveness of the mailed questionnaire. After the follow-up questionnaire was sent out, the researcher telephoned the study's sample. In many instances the researcher was informed that the respondent had not even received the initial questionnaire. This may be explained by poor mail service or the presence of 'gatekeepers' who restrict the mail that is delivered to the respondent. Likewise, many companies have become so overwhelmed by the number of surveys that they are requested to complete that many have implemented policies against completing them.

7. BENEFITS OF THE STUDY

7.1 Policy Implications

This study has significant policy implications for regions attempting to attract investment. As noted in the literature review, a place's image is a critical determinant of the way investors respond to a place. Therefore, policy makers must determine the image, real or imagined, that companies hold. Developing performance maps will enable policy makers to identify key areas where a region's performance lags behind its competitors and work to strengthen those areas. It also enables a region to emphasize those areas where it outshines its competitors by stressing and building upon those strengths (Barich and Kotler 1991). Policy makers can also attempt to promote those variables that a region performed well on, but which were not considered important by high technology companies. Marketing strategies can be developed that attempt to alter high technology companies' assessment of the importance of various location variables. Overall, a region that continually re-evaluates its image will be able to detect unfavourable image shifts early and act immediately. As well, it can learn whether its corrective actions have been effective in improving its image.

Recently, a lot of attention from various urban actors, media, business, and local government, has been directed towards marketing the Ottawa region as a high technology centre. However, given the responses that were obtained from Section 6 of the questionnaire, which sought to determine respondents overall knowledge about the various regions, the Ottawa region has yet to make the transition from being perceived as a "government town" to the

“software capital of Canada”. The two largest software companies in Canada, Corel and Cognos, are located in this region. The largest PC manufacturer in Canada, Digital, is also located here. As noted above, performance maps are effective at determining a region’s strengths and weaknesses. With regards to Ottawa, policy makers should promote the quality of life in this region. Specifically, this was one of the main criteria that swayed Nortel into investing \$250 million in this region. Promotional techniques that could be used by cities include advertising in trade papers, direct mailing, participation in trade shows, and industrial prospecting trips.

The findings from this study have also emphasized the importance of a qualified labour force to high technology companies. Policy makers should place greater emphasis on implementing educational programs that develop the skills necessary to high technology companies. That is, policy makers should develop a product/city that is a desirable site for investment to high technology companies. Effort should also be taken in promoting these academic institutions. Section 6 of the questionnaire revealed that respondents rarely associated an academic institution to the Ottawa region. High technology companies may question the quality and the availability of the labour force if they are unaware of the presence of appropriate academic institutions.

The business community in Ottawa has noted that there exists a shortage of skilled workers in this region. Greater effort should be taken by policy makers to attract skilled workers. Advertising in business/academic magazines and on various campuses should be considered.

On a national level, the government should continue to relax immigration rules that permit quicker and easier entry of high technology workers.

Marketing this region will require that policy makers continue to participate in trade missions e.g., Mayor of Ottawa's recent trip to China (Silicon Valley North, January 1997). Trade missions provide an opportunity to market a region to various foreign markets. These missions have been successful at the national level (e.g., Team Canada) and therefore, local governments, who are also players on the international arena for investment, should actively participate in this type of endeavour. The most important concept that should be conveyed by policy makers on these trade missions is that Ottawa should no longer be defined simply as a 'government town' but rather, Canada's high tech capital. That is, Ottawa is home to over 700 advanced technology companies which include the largest PC manufacturer in Canada and two of the largest Canadian software companies.

For a region to successfully market itself as a desirable site for investment, it is imperative that a consistent image be conveyed to the desired target group. Failure to develop a unified approach may result in divergent images of a city being conveyed to investors. Lack of consistency in a city's image may confuse the investor, who may then decide to locate operations elsewhere. Ottawa is a region that has a dozen municipalities, 'each with its own voice'. Lack of agreement between these municipalities, with regards to the development of an effective marketing plan, will hinder this region's ability to attract investors. The mayor of Ottawa, Jacquelin Holzman had also stated that "for people who do business, it's

confusion. It's more helpful if we are one entity in the global market and have one voice" (Silicon Valley North, January 1997: p.11).

It is also important for policy makers to determine the overall knowledge that a specific target group has about a region. With regards to the Ottawa region, this research revealed that respondents, when asked what was the first thing that came to mind about each region, most associated the term "government" to Ottawa. This indicates that external companies are not as familiar with the high technology industry that is flourishing in this area. Greater effort must then be taken to stress the well-known companies that are currently located here. In the research findings it was revealed that business partners in the target regions were important sources of information to high technology companies. Therefore, it is essential that local companies actively promote their city as an ideal site for investment.

Policy makers must also be aware of other information sources that are relevant to various target groups. With the realization that the Internet is considered an important source of information, many policy makers should devote effort into using this vehicle as a tool for promotion.

It is also essential for policy makers to encourage networking among local companies. The main theme arising from a recent conference in Ottawa, Technopolis '97, was the importance of networking among companies. Rosabeth Moss Kantor, professor of Business Administration at Harvard University, emphasized that networking is essential for the

continued development of high technology clusters. Companies that are isolated will fail. At this conference, Anna Lee Saxenian also emphasized that relationships foster entrepreneurship, innovation, and joint learning. She attributed the networks that exist among companies in Silicon Valley as one of the main reasons for that region's continued success. Therefore, policy makers should establish organizations which provide local companies with the opportunity to network. For instance, OCRI Zone5ive enables Ottawa based companies the opportunity to meet monthly and thus share information.

It is also important for policy makers to identify the target group that a region is attempting to attract. Findings from this study have indicated that different high technology sectors, companies of different size, and companies from different countries rate the importance of investment objectives or location variables differently. Therefore, policy makers should identify a region's target group and then work at developing or offering the criteria that are considered important to this group. For instance, large size Canadian companies (over \$50 million in sales) placed greater importance on: accessing skills, benefiting from lower labour costs, and lower production costs. These are variables that a region should focus on strengthening if large size Canadian companies are the target group that it is attempting to attract. In other words, policy makers should work at providing a product/city that is desirable as a site for investment by investors in high technology sectors

Overall, this research has provided information about the key elements of each of the five regions, according to potential technology investors. Policy makers attempting to enhance

regional economic development can examine the profiles of each of the regions when developing marketing strategies. Policy makers should also place priority on all the elements of the marketing mix.

7.2 Research Implications

Although the high technology sector is widely sought by many regions, little consensus exists in the literature regarding the importance of: information sources, investment objectives and location variables to this target group. This study has advanced our understanding of these issues to specific industries within the high technology sector. That is, this study has examined the importance of the above issues for companies in the telecommunication, computer hardware and computer software sectors. Previous studies appear to survey all companies that are considered high tech. However, various industry sectors will differ in their ratings of various issues such as location variables. It was revealed in this study that computer hardware and computer software companies significantly differ in their ratings on the importance of various location variables. For instance, computer hardware companies gave higher importance ratings, than software companies, to energy and related utility costs, overall physical infrastructure, and proximity to suppliers variables.

This study has also contributed to the product-county image literature by focusing on how the image of a region can influence the investment decision making process. Globalization of markets has led to regions actively attracting investment. However, past research has focused upon the impact that a country's image has on the investment decision process. This study has focused on obtaining an overall assessment of the regions and then determining how

this image influences a company's decision to invest. The findings from this study indicated that the regions that have the highest overall ratings on the various location variables, also had the greatest number of respondents who mentioned that they would consider this region as a site for potential investment.

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Appendix A - Local Economic Development Policies

A. Traditional Economic Development Policies

- 1) Marketing Area as Branch Plant Location
 - Industrial development advertising
 - Marketing trips to corporate headquarters
 - Provision of site information to prospects
- 2) Financial Incentives
 - Industrial revenue bonds
 - Property tax abatements
 - Other tax relief
 - Provision of land at below-market prices
 - Direct state loans
- 3) Nonfinancial Incentives to Branch Plants
 - Customized industrial training
 - Expedited provision of site-specific infrastructure
 - Help with regulatory problems

B. 'New Wave' Economic Development Policies

- 1) Capital Market Programs
 - Predominantly government-financed loan or equity programs
 - Government support for predominantly privately financed loan or equity programs
- 2) Information/Education for Small Business
 - Small business ombudsman/information office
 - Community college classes in starting a business
 - Small business development centres
 - Entrepreneurial training programs
 - Small business incubators
- 3) Research and High Technology
 - Centres of excellence in business-related research at public universities
 - Research-oriented industrial parks
 - Applied research grants
 - Technology transfer programs/industrial extension services
- 4) Export Assistance
 - Information/training in how to export
 - Trade mission
 - Export financing

Source: Bartik, Timothy J. (1991), *Who Benefits From State and Local Economic Development Policies?*, Michigan: W.E. Upjohn Institute for Employment Research, p.4.

Appendix B - Location Variables of High Technology Firms

Location Variables	Glaser et al. Survey (1982)	Joint Economic Congress Survey (1982)	Osman and Kyzymowski (1983)	Glaser, Hall and Matheson (1983)	Malcolm Sharf (1983)	Stead and Dicks (1983)	Beckert's Test of Locational Attraction Survey (1984)	Congress of the United States Office of Technology Assessment Survey (1984)	Kolz (1984)	Matheson, Hall and Glaser (1985)	Christy Ironside (1987)	Dorman (1988)	Balmer (1989)	Balmer, Hecht and Godden (1990)	Hecht and Godden (1993)	Koller, Heiler and Ren (1993)
Labour costs		X		X		X	X	X		X	X	X	X	X	X	X
Tax climate, provincial municipal, personal		X	X		X	X		X	X		X	X	X	X	X	X
Academic institutions	X	X				X		X			X	X	X	X	X	X
Access to R&D facilities		X		X		X		X			X	X	X	X	X	X
Cost of living		X	X			X		X			X	X	X	X	X	X
Transportation		X	X			X		X			X	X	X	X	X	X
Access to markets		X	X			X		X			X	X	X	X	X	X
Amenities, cultural & recreational		X		X		X					X	X	X	X	X	X
Climate		X	X			X					X	X	X	X	X	X
Access to raw materials		X				X					X	X	X	X	X	X
Physical infrastructure, airports, hospitals, etc		X	X			X					X	X	X	X	X	X
Defense spending	X			X		X					X	X	X	X	X	X
Founding entrepreneur lived there/proximity to place of education						X		X	X							
Quality of life			X		X	X		X	X							
Venture capital availability						X		X	X							
Proximity to large urban centers			X		X	X		X	X							
Financial incentives			X		X	X	X	X	X							
Availability of suitable sites			X			X		X	X							
Proximity to suppliers			X		X	X		X	X							
Political stability						X		X	X							
Proximity to government departments/offices						X		X	X							
Leading entrepreneur/firm		X				X		X	X							
Regional/regulatory practices		X				X		X	X							
Energy cost/availability			X			X		X	X							
Pro-business attitude			X			X		X	X							
Technical and professional services			X			X		X	X							
Potential of local market			X			X		X	X							
Agglomeration effect		X				X		X	X							
Presence of development organizations					X			X	X							
Close to existing operations								X	X							
Language and labour laws			X					X	X							
Presence of information and advisory services								X	X							
Strong public expenditure component								X	X							
Housing facilities			X					X	X							
Facilities for exporting and importing			X					X	X							
Ample space for future expansion			X					X	X							
Education programs								X	X							
Crime levels								X	X							
General attractiveness of the city		X				X		X	X							

Appendix C - Overview of Directories

One of the most difficult and arduous tasks of this research was the collecting of recent and representative directories from the telecommunications, and computer hardware and software industries for each region. The ease of obtaining a high technology directory for the Ottawa-Carleton region misled the researcher in assuming that the other regions in the study would provide comparable directories. However, few of the regions were able to provide complete and representative directories at reasonable costs. This was a surprise to the researcher who assumed that an industry that regions actively attempt to attract, would be better surveyed. Numerous sources were considered, however, it was difficult to obtain a directory that was appropriate and yet reasonably priced. Below is a breakdown of how and where each of the directories were obtained for the regions and the two overlay samples.

OTTAWA:

As noted, the Ottawa-Carleton Economic Development Corporation (OCEDCO) was able to provide a directory that was devoted to the high technology community for 1996. This directory provided the necessary information that the researcher needed when selecting the sample. This directory listed the major product groups for each company, as well as the number of employees. One hundred and fifty seven companies from the appropriate high technology sectors and with 25 or more employees were identified and selected.

CTT (Guelph, Cambridge, Kitchener, Waterloo and London):

The economic development agencies within each of the regions that comprise the CTT area were contacted and individual manufacturing directories were obtained for each region. Unlike the Ottawa-Carleton directory, these directories were not specific to the high technology industry. The researcher had to identify which companies fell under the desired high technology sectors by using Standard Industrial Classification (SIC) and by reading the brief description that accompanied each company. The directories were for the 1996 year and each provided information regarding the number of employees per company. Although a preliminary research of this region indicated over 350 high technology companies, many did not meet sample size/selection criteria. To ensure that this region remained in the study the whole population of relevant companies was included, resulting in a total of 73 companies. As the sample size was still considered to be small, the city of London was then included. A

local manufacturing directory was obtained and an additional 27 high technology companies were identified and included in the final list.

PALO ALTO:

The researcher was unable to obtain a recent and comprehensive directory for this region. Various Chambers of Commerce within this region (Palo Alto, Santa Clara, San Jose) were unable to provide a relevant/comprehensive high technology or manufacturing directory for this area. As well, these Chambers of Commerce were unable to provide basic statistics regarding the high technology sector within their communities (e.g., the percentage of companies that were in the software, hardware or telecommunications industry). Although various companies whose mission is to provide these directories were suggested, the costs associated with them were too high to consider. Eventually, the researcher was able to locate a recent and comprehensive directory for the US at a local library. The 1997 Ward's Business Directory contained listings of companies segmented by SIC codes for each state. Companies that were located in the Silicon Valley region, Palo Alto, Santa Clara, San Jose, Milipitas, Cupertino, with either annual sales exceeding \$10 million or 25 or more employees were highlighted. A total list of 465 companies was obtained. Every third company was then systematically selected to ensure a sample size of 155 companies.

BOSTON:

The Chamber of Commerce within the Boston area was unable to provide an appropriate directory that would be of assistance in sample selection, although this agency was able to direct us to a local newspaper which did maintain a recent and comprehensive high technology directory. Unfortunately, the MassHigh Tech directory was too costly to purchase.

A listing of high technology companies in the desired sectors, with 25 or more employees and/or sales of \$10 million, was eventually obtained from a Computer Select program at a local library for the state of Massachusetts. Companies located along Route 128, in the cities of: Boston, Maynard, Lexington, and Cambridge were identified. Another list of companies along Route 128, which met sample size criteria, was identified using the 1997 Ward's

Business directory. Both lists were combined and any duplicate companies were eliminated. This resulted in a list of 156 companies.

RALEIGH:

Three directories were obtained for this region. The *North Carolina's Research Triangle Region Manufacturer's Directory* was obtained from the Research Triangle Regional Partnership. The second directory, *North Carolina High-Tech Industry Guide*, was obtained from the Raleigh Chamber of Commerce. Neither of these directories provided information regarding sales or the number of employees. A brief description or an SIC code was used to identify companies in the relevant high technology sectors. From this list, those companies that were located in Raleigh, Durham, Chapel Hill, Charlotte and Wake were selected. However, all companies were included regardless of annual sales and number of employees due to the small number of companies that were identified. The third directory, *Research Triangle Park*, was obtained from the Research Triangle Foundation of North Carolina. This directory did provide information about the number of employees and a brief description for each company was also provided. Companies from the appropriate high technology sectors for each directory were combined. Any duplicate companies were eliminated. This resulted in a list of 110 companies. To ensure the necessary 150 companies specified in the proposal, the 1997 Ward's Business Directory and the Computer Select program were referred to. Relevant companies were identified and all lists from each source were combined and cleaned. A total of 153 companies resulted.

American overlay (top 200 HT companies):

After searching through numerous magazines and national directories, a list for the top American telecommunications, computer hardware and computer software companies was eventually identified in the 1996 CorpTech Directory. This directory also provided information about the company address, sales and the number of employees.

Canadian overlay (top 200 HT companies):

Living in the nation's capital, with a number of government departments, libraries and an established high technology sector, the researcher felt confident that a list of the top high technology companies in Canada would be available. Unfortunately, this list proved to be the

most difficult one to obtain. Various organizations/libraries/universities were contacted or visited: National Research Council, Statistics Canada, Industry Canada, Carleton University Library, University of Ottawa Library, Metcalfe Library, Foreign Affairs and International Trade, Canadian Radio-television and Telecommunications Commission (CRTC) and Software Human Resource Council Inc. Two local companies, Nortel and Mitel, were also contacted. None of these avenues proved to be very productive. Eventually, the Financial Post's Branham list of Top Independent Canadian Software companies for 1996 and 1997 was used to determine the top software companies. Various directories were then used to obtain information regarding company address, number of employees, annual sales and the key executive officers. Various directories were referred to in order to obtain the necessary information for each company. The directories that were used as reference were as follows: Business Opportunities Sourcing System (BOSS), Financial Post Industry Survey Group, Standard & Poor's Register of Corporations, Canadian Trade Index, Telecommunications Directory and Canadian Business Key Index. These directories were also used to obtain the list of the top computer hardware and telecommunication companies. Number of employees, annual sales and SIC codes were used to develop a list. The telecommunications list was supplemented with a list of top telecommunication carriers that was obtained from the CRTC.

Only the sources which were considered the most promising have been mentioned above. However, other sources were also considered and contacted. For instance, various national directories were considered yet found to be incomplete. Agencies, whose mission is to collect company information, CorpTech and Mentor, were contacted but the prices were excessively high. Local business journals and other local newspapers were also contacted. Overall, a great amount of effort and time was spent on the collection of the sampling lists for this study. It is noteworthy, that a prominent national consulting company who attempted to assist in this task did not have any better success than the researcher and, in fact, was considerably less successful in this task overall, at locating appropriate directories.

Appendix D - Canadian and American Views on Investment Objectives - MANOVA

Multivariate Tests of Significance (S = 1, M = 8 , N = 0)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.67440	.23014	18.00	2.00	.971
Hotellings	2.07129	.23014	18.00	2.00	.971
Wilks	.32560	.23014	18.00	2.00	.971
Roys	.67440				

Note.. F statistics are exact.

EFFECT .. COUNTRY (Cont.)

Univariate F-tests with (1,19) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
ACSSKIL	1.16667	32.07143	1.16667	1.68797	.69117	.416
BET_INV	.09524	26.57143	.09524	1.39850	.06810	.797
CLOSNMKT	.21429	20.35714	.21429	1.07143	.20000	.660
CURRFLUC	.00000	20.57143	.00000	1.08271	.00000	1.000
ESTB_CDN	.02381	39.21429	.02381	2.06391	.01154	.916
ESTB_US	1.92857	46.64286	1.92857	2.45489	.78560	.387
FEGOVINC	.21429	34.92857	.21429	1.83835	.11656	.737
FOLWCOMP	.38095	18.85714	.38095	.99248	.38384	.543
GOVTREQ	.38095	34.28571	.38095	1.80451	.21111	.651
LOWLABC	.09524	28.57143	.09524	1.50376	.06333	.804
LOWPROC	.38095	36.57143	.38095	1.92481	.19792	.661
LOGOVINC	.38095	24.85714	.38095	1.30827	.29119	.596
MAJORSUP	.21429	18.35714	.21429	.96617	.22179	.643
NATTRDBR	.02381	33.21429	.02381	1.74812	.01362	.908
POTCUSTM	.85714	17.71429	.85714	.93233	.91935	.350
PROTEMKT	.59524	31.21429	.59524	1.64286	.36232	.554
PRGOVINC	.09524	28.85714	.09524	1.51880	.06271	.805
TRADEBAR	.85714	33.42857	.85714	1.75940	.48718	.494

Appendix E - Discriminant Analysis on how different sized companies from Canada and the US consider the importance of investment objectives

- Follow-up Tests for a Significant K=3 Group Manova
- Company size (less \$10 million, \$10-\$50 million, over \$50M)
- Analysis by investment objective factors

** The overall level for the pairwise T tests at 15% (Stevens 1992: p.198), therefore, a 5% Bonferroni level will be used for the three individual pairwise tests.

Factor 1: Government - Canadian companies

F statistics and significances between pairs of groups after step 4
Each F statistic has 4 and 82 degrees of freedom.

Group	Group	
	1 less 10 million	2 10 million - 50 milli
2 10 million - 50 milli	.2427 .9133	
3 over 50 mill ion	1.4986 .2102	1.8261 .1316

Factor 1: Government - US companies

F statistics and significances between pairs of groups after step 4
Each F statistic has 4 and 49 degrees of freedom.

Group	Group	
	1 <10 million	2 10 million - 50 milli
2 10 million - 50 milli	.2877 .8845	
3 over 50 mill ion	1.3380 .2692	1.4357 .2363

Factor 2: Market - US companies

F statistics and significances between pairs of groups after step 4
Each F statistic has 4 and 50 degrees of freedom.

Group	Group	
	1 less 10 million	2 10 million - 50 milli
2 10 million - 50 milli	2.3874 .0634	
3 over 50 mill ion	1.3182 .2761	.6346 .6402

F level or tolerance or VIN insufficient for further computation.

Factor 2: Market - Canadian companies

F statistics and significances between pairs of groups after step 4
Each F statistic has 4 and 79 degrees of freedom.

Group	Group	
	1 less 10 million	2 10 million - 50 milli
2 10 million - 50 milli	.7713 .5471	
3 over 50 mill ion	.4360 .7822	1.2749 .2869

F level or tolerance or VIN insufficient for further computation.

Factor 3: Country Presence - Canadian companies

F statistics and significances between pairs of groups after step 3
Each F statistic has 3 and 79 degrees of freedom.

Group	Group	
	1 less 10 million	2 10 million - 50 milli
2 10 million - 50 milli	.1642 .9202	
3 over 50 mill ion	5.9490 .0010	4.0693 .0096

F level or tolerance or VIN insufficient for further computation.

Factor 3: Country Presence - US companies

F statistics and significances between pairs of groups after step 3
Each F statistic has 3 and 44 degrees of freedom.

Group	Group	
	1	2
	less 10 million	10 million - 50 milli
2	10 million - 50 milli	
	.2716	
	.8456	
3	over 50 mill ion	
	.4136	1.4163
	.7440	.2507

F level or tolerance or VIN insufficient for further computation.

Factor 4: Labour/Production Costs - US companies

F statistics and significances between pairs of groups after step 3
Each F statistic has 3 and 50 degrees of freedom.

Group	Group	
	1	2
	less 10 million	10 million - 50 milli
2	10 million - 50 milli	
	.9992	
	.4010	
3	over 50 mill ion	
	.5716	1.4129
	.6363	.2500

F level or tolerance or VIN insufficient for further computation.

Factor 4: Labour/Production Costs- Canadian companies

F statistics and significances between pairs of groups after step 3
Each F statistic has 3 and 82 degrees of freedom.

Group	Group	
	1	2
	less 10 million	10 million - 50 milli
2	10 million - 50 milli	
	.2067	
	.8915	
3	over 50 mill ion	
	4.0462	3.6463
	.0098	.0160

F level or tolerance or VIN insufficient for further computation.

Factor 5: Risk Hedging - Canadian companies

F statistics and significances between pairs of groups after step 2
 Each F statistic has 2 and 79 degrees of freedom.

Group	Group	
	1 less 10 million	2 10 million - 50 million
2 10 million - 50 milli	.3750 .6885	
3 over 50 mill ion	.6680 .5156	.5456 .5817

F level or tolerance or VIN insufficient for further computation.

Factor 5: Risk Hedging - US companies

F statistics and significances between pairs of groups after step 2
 Each F statistic has 2 and 46 degrees of freedom.

Group	Group	
	1 less 10 million	2 10 million - 50 million
2 10 million - 50 million	.5762 .5660	
3 over 50 mill ion	.7136 .4952	.2068 .8140

F level or tolerance or VIN insufficient for further computation.

Follow up t-tests are run to determine which variables contribute to each of the significant pairwise group differences.

**** This input has been edited to remove non-essential data**

RUN #1 - GROUPS 1 AND 3: Factor 3 (Country Presence)

Variable	Number of Cases	Mean	SD	SE of Mean
ESTB_US to establish a presence in the US				
less 10 million	38	4.0789	1.075	.174
over 50 million	19	3.2632	1.408	.323
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	2.43	55	.018	.336
				95% CI for Diff
				(.143, 1.488)
SIGNIFICANT at 5%				

Variable	Number of Cases	Mean	SD	SE of Mean
GOVTREQ to meet government requirements				
less 10 million	40	2.4250	1.318	.208
over 50 million	21	3.5714	1.076	.235
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-3.43	59	.001	.335
				95% CI for Diff
				(-1.816, -.477)
SIGNIFICANT at 5%				

Variable	Number of Cases	Mean	SD	SE of Mean
NATTRDBR to overcome national trade barriers				
less 10 million	40	2.6750	1.385	.219
over 50 million	21	3.2381	.995	.217

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-1.65	59	.104	.341	(-1.246, .120)

NOT SIGNIFICANT at 5%

RUN #2 - GROUPS 2 and 3: Factor 3 (Country Presence)

Variable	Number of Cases	Mean	SD	SE of Mean
ESTB_US to establish a presence in the US				
10 million -50 mil	27	3.8889	.974	.187
over 50 million	19	3.2632	1.408	.323

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	1.78	44	.081	.351	(-.081, 1.333)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
GOVTREQ to meet government requirements				
10 million -50 mil	28	2.5000	1.232	.233
over 50 million	21	3.5714	1.076	.235

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-3.18	47	.003	.337	(-1.750, -.393)

SIGNIFICANT at 5%

Variable		Number of Cases	Mean	SD	SE of Mean
NATTRDBR to overcome national trade barriers					
10 million -50 mil		28	2.6786	1.219	.230
over 50 million		21	3.2381	.995	.217
t-test for Equality of Means					
Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-1.72	47	.093	.326	(-1.215, .096)
NOT SIGNIFICANT at 5%					

RUN #1 - GROUPS 1 and 3: Factor 4 (Labour/Production Costs)

Variable		Number of Cases	Mean	SD	SE of Mean
ACCSSKIL to access special design, engineering skills					
less 10 million		40	3.2500	1.276	.202
over 50 million		20	4.3000	.865	.193
t-test for Equality of Means					
Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-3.31	58	.002	.317	(-1.685, -.415)
SIGNIFICANT at 5%					

Variable		Number of Cases	Mean	SD	SE of Mean
LOWLABC to benefit from lower labour costs/higer productivit					
less 10 million		40	2.6250	1.390	.220
over 50 million		20	3.6000	1.273	.285
t-test for Equality of Means					
Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-2.63	58	.011	.371	(-1.717, -.233)
SIGNIFICANT at 5%					

Variable	Number of Cases	Mean	SD	SE of Mean
LOWPROC to lower production costs				
less 10 million	40	2.3500	1.292	.204
over 50 million	20	3.2500	1.446	.323
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-2.44	58	.018	.368
				95% CI for Diff
				(-1.637, -.163)

SIGNIFICANT at 5%

RUN #2 - GROUPS 2 and 3: Factor 4 (Labour/Production Costs)

Variable	Number of Cases	Mean	SD	SE of Mean
ACCSSKIL to access special design, engineering skills				
10 million -50 mil	28	3.2500	1.430	.270
over 50 million	20	4.3000	.865	.193
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-2.92	46	.005	.360
				95% CI for Diff
				(-1.774, -.326)

SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
LOWLABC to benefit from lower labour costs/higher productivi				
10 million -50 mil	27	2.6296	1.182	.227
over 50 million	20	3.6000	1.273	.285
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-2.69	45	.010	.360
				95% CI for Diff
				(-1.696, -.245)

SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
LOWPROC to lower production costs				
10 million -50 mil	28	2.5357	1.261	.238
over 50 million	20	3.2500	1.446	.323
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-1.82	46	.075	.393
				95% CI for Diff
				(-1.505, .076)
NOT SIGNIFICANT at 5%				

Appendix F - Canadian and American views on the importance of location variables - MANOVA

* * * * * A n a l y s i s o f V a r i a n c e * * * * *

154 cases accepted.

0 cases rejected because of out-of-range factor values.

10 cases rejected because of missing data.

2 non-empty cells.

1 design will be processed.

EFFECT .. COUNTRY

Multivariate Tests of Significance (S = 1, M = 14 1/2, N = 60)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.28187	1.54472	31.00	122.00	.050
Hotellings	.39251	1.54472	31.00	122.00	.050
Wilks	.71813	1.54472	31.00	122.00	.050
Roys	.28187				

Note.. F statistics are exact.

EFFECT .. COUNTRY (Cont.)

Univariate F-tests with (1,152) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
IACCRD	5.06770	228.05567	5.06770	1.50037	3.37764	.068
IATTCITY	1.95774	127.89291	1.95774	.84140	2.32676	.129
ICLIMATE	11.42408	113.30319	11.42408	.74542	15.32578	.000
ICSTLIV	2.20532	141.69078	2.20532	.93218	2.36578	.126
ICRIMELV	.61691	153.87660	.61691	1.01235	.60939	.436
IENGUTIL	5.88054	159.68440	5.88054	1.05056	5.59755	.019
IEXPMGR	.74054	173.16206	.74054	1.13922	.65004	.421
IGOVINC	.14756	208.91738	.14756	1.37446	.10736	.744
IGOVREGU	.89565	183.78617	.89565	1.20912	.74074	.391
IGVTATT	.34323	130.88404	.34323	.86108	.39860	.529
IHARDWRK	12.29601	180.17801	12.29601	1.18538	10.37304	.002
IHOUSFAC	8.66899	185.46738	8.66899	1.22018	7.10468	.009
IINFRAST	3.35874	141.55035	3.35874	.93125	3.60669	.059
ILABCAST	7.04692	168.85567	7.04692	1.11089	6.34348	.013
ILABSKIL	2.79470	154.78972	2.79470	1.01835	2.74433	.100
ILEADCO	1.88634	214.26950	1.88634	1.40967	1.33815	.249
ILOCREGU	.50152	171.71277	.50152	1.12969	.44394	.506
ILOCTAX	.68262	155.81738	.68262	1.02511	.66590	.416
IPCOMPS	.57062	168.78652	.57062	1.11044	.51387	.475
IPCUST	.00288	171.06206	.00288	1.12541	.00256	.960
IPOTHROP	6.80969	190.59291	6.80969	1.25390	5.43080	.021
IPRVTAX	.26527	175.81915	.26527	1.15670	.22933	.633
IPSUPP	1.62492	192.08936	1.62492	1.26375	1.28580	.259
IPURBAN	.24151	177.84291	.24151	1.17002	.20641	.650
IQUALLIF	.46864	118.95993	.46864	.78263	.59880	.440
ISITES	6.95607	236.60887	6.95607	1.55664	4.46865	.036
ISIZEMKT	1.14673	214.61950	1.14673	1.41197	.81215	.369
ITECHADV	8.19543	185.36950	8.19543	1.21954	6.72012	.010
ITECHSRV	.10362	164.73404	.10362	1.08378	.09561	.758
IUNIVRC	10.41732	194.93333	10.41732	1.28246	8.12294	.005
IVENTCAP	.01496	230.42660	.01496	1.51596	.00987	.921

Appendix G -Discriminant analysis on how companies from different industries view the importance of location variables

- Follow-Up Tests for a Significant K=3 Group Manova
- Groups: Software, Hardware and Telecommunication companies

STEP #1

F statistics and significances between pairs of groups after step 31
Each F statistic has 31 and 110 degrees of freedom.

Group		Group	1	2
		software	hardware	
2	hardware	2.0544		
		.0034		
3	telecom	1.0126	1.3399	
		.4613	.1370	

F level or tolerance or VIN insufficient for further computation.

*** The overall level for the pairwise T tests at 15% (Stevens 1992, p.198), which means we can use the 5% Bonferroni level for the three individual pairwise tests. Therefore, we conclude from the above that the groups 1 & 2 differ significantly.*

STEP #2 - TO DETERMINE WHICH VARIABLES CONTRIBUTE TO THE SIGNIFICANT PAIRWISE GROUP DIFFERENCE t-TESTS WERE RUN.
- GROUP 1 (SOFTWARE), GROUP 2 (HARDWARE)

NB - NON ESSENTIAL OUTPUT HAS BEEN REMOVED

Variable	Number of Cases	Mean	SD	SE of Mean
IACCRD Access to R&D facilities				
software	80	2.6750	1.290	.144
hardware	35	3.2286	1.087	.184
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-2.22	113	.029	.250
				95% CI for Diff
				(-1.049, -.059)

SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IATTCITY overall attractiveness of city/region				
software	80	3.2125	.977	.109
hardware	33	3.4848	.795	.138

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-1.42	111	.159	.192	(-.653, .108)

NOT SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ICLIMATE physical climate				
software	80	2.8000	.933	.104
hardware	35	2.9429	.873	.147

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-.77	113	.443	.186	(-.510, .225)

NOT SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ICOSTLIV cost of living				
software	80	2.9875	1.013	.113
hardware	35	3.0857	.919	.155

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff

Equal	-.49	113	.624	.200	(-.494, .298)
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NOT SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ICRIMELV crime level				
software	80	3.0250	1.043	.117
hardware	35	3.3714	1.060	.179

t-test for Equality of Means				95%	
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-1.63	113	.106	.212	(-.767, .074)

NOT SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IENGUTIL energy & related utility costs				
software	80	2.0750	.991	.111
hardware	35	2.7429	1.010	.171

t-test for Equality of Means				95%	
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-3.31	113	.001	.202	(-1.068, -.268)

SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IEXPMGR local availability of expert managers				
software	80	3.6875	1.014	.113
hardware	35	3.6857	1.132	.191

t-test for Equality of Means	95%
------------------------------	-----

Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	.01	113	.993	.213	(-.420, .424)

NOT SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IGOVINC availability of government incentives for business				
software	79	2.7722	1.154	.130
hardware	35	3.0000	1.283	.217

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-.94	112	.350	.243	(-.709, .253)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IGOVREGU national regulatory practices				
software	79	2.6835	1.104	.124
hardware	35	3.3714	1.114	.188

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-3.06	112	.003	.225	(-1.133, -.242)

SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IGVTATT government attitude to business and investment				
software	79	3.4177	.982	.110
hardware	35	3.9429	.873	.147

t-test for Equality of Means						95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff	
Equal	-2.72	112	.008	.193	(-.907, -.143)	

SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IHWDRK industriousness of the work force				
software	80	3.1625	1.152	.129
hardware	35	4.0286	.857	.145

t-test for Equality of Means						95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff	
Equal	-3.99	113	.000	.217	(-1.297, -.436)	

SIGNIFICANT AT 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IHOUSEFAC housing, schooling & cultural/recreation				
software	80	3.0125	1.206	.135
hardware	35	3.3429	1.162	.196

t-test for Equality of Means						95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff	
Equal	-1.37	113	.175	.242	(-.810, .149)	

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IINFRAST overall physical infrastructure				
software	80	2.9000	.963	.108
hardware	35	3.6286	.843	.143

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-3.87	113	.000	.188	(-1.101, -.356)

SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ILABCOST low labour costs				
software	80	2.6250	1.048	.117
hardware	35	3.3714	1.114	.188

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-3.45	113	.001	.216	(-1.175, -.317)

SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean	
ILABSKIL local availability of the right labour skills					
software	80	3.9375	1.048	.117	
hardware	35	4.1143	.932	.158	
t-test for Equality of Means				95%	
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-.86	113	.392	.206	(-.584, .231)
NOT SIGNIFICANT at 5%					

Variable	Number of Cases	Mean	SD	SE of Mean	
ILEADCO presence of leading companies or entrepreneur					
software	80	3.1375	1.270	.142	
hardware	35	3.4000	1.117	.189	
t-test for Equality of Means				95%	
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-1.06	113	.293	.248	(-.755, .230)
NOT SIGNIFICANT at 5%					

Variable	Number of Cases	Mean	SD	SE of Mean
ILOCREGU regional regulatory practices				
software	79	2.6709	1.071	.120
hardware	35	3.4000	1.035	.175
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-3.39	112	.001	.215
95% CI for Diff				
(-1.156, -.303)				
SIGNIFICANT at 5%				

Variable	Number of Cases	Mean	SD	SE of Mean
ILOCTAX local tax climate for business				
software	79	3.3671	1.123	.126
hardware	34	3.8235	.904	.155
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-2.09	111	.038	.218
95% CI for Diff				
(-.888, -.025)				
SIGNIFICANT at 5%				

Variable	Number of Cases	Mean	SD	SE of Mean
IPCOMPS proximity to complementary or competing				
software	80	2.7000	1.163	.130
hardware	35	2.5429	1.039	.176
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	.69	113	.493	.228
95% CI for Diff				
(-.295, .610)				
NOT SIGNIFICANT at 5%				

Variable	Number of Cases	Mean	SD	SE of Mean
IPCUST proximity to major customers and markets				
software	80	4.1875	1.068	.119
hardware	35	3.6286	1.239	.209
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	2.46	113	.016	.227
				95% CI for Diff
				(.108, 1.010)

SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IPOTHROP proximity to other existing operations				
software	80	2.7500	1.164	.130
hardware	34	2.8529	1.282	.220
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-.42	112	.676	.246
				95% CI for Diff
				(-.590, .384)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IPRVTAX state/provincial and national tax climate				
software	79	3.3418	1.175	.132
hardware	35	3.6571	.998	.169
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-1.38	112	.170	.228
				95% CI for Diff
				(-.768, .137)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IPSUPP proximity to suppliers				
software	80	2.2875	1.138	.127
hardware	35	3.0857	.981	.166
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-3.60	113	.000	.222
				95% CI for Diff (-1.237, -.359)

SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IPURBAN proximity to large urban centres				
software	80	3.4000	1.165	.130
hardware	35	3.0857	1.011	.171
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	1.38	113	.169	.227
				95% CI for Diff (-.136, .764)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IQUALLIF overall quality of life				
software	80	3.5875	.924	.103
hardware	35	3.8571	.810	.137
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-1.49	113	.138	.181
				95% CI for Diff (-.627, .088)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ISITES availability of suitable sites in research centres				
software	80	2.6375	1.265	.141
hardware	35	3.0571	1.136	.192
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-1.69	113	.094	.249
			95% CI for Diff	
			(-.913, .073)	

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ISIZEMKT size and potential of local market				
software	80	3.7000	1.226	.137
hardware	35	3.4857	1.358	.230
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	.83	113	.406	.257
			95% CI for Diff	
			(-.295, .723)	

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ITECHADV Overall level of technological advancement				
software	80	3.5125	1.191	.133
hardware	35	3.7429	.780	.132
t-test for Equality of Means				
Variances	t-value	df	2-Tail Sig	SE of Diff
Equal	-1.05	113	.296	.220
			95% CI for Diff	
			(-.666, .205)	

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
ITECHSRV local availability of technical and professional services				

software	80	3.9625	.999	.112
hardware	35	4.1143	1.022	.173

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-.74	113	.458	.204	(-.556, .252)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IUNIVRC presence of universities and research centres				

software	80	3.2375	1.245	.139
hardware	35	3.5429	1.094	.185

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-1.25	113	.212	.244	(-.788, .177)

NOT SIGNIFICANT at 5%

Variable	Number of Cases	Mean	SD	SE of Mean
IVENTCAP availability of venture capital				

software	80	2.2000	1.205	.135
hardware	35	2.8571	1.498	.253

t-test for Equality of Means					95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-2.49	113	.014	.264	(-1.179, -.135)

SIGNIFICANT at 5%

Appendix H - How educational background influences the importance of location criteria - MANOVA.

* * * * * A n a l y s i s o f V a r i a n c e -- design 1 * * * *

EFFECT .. EDUCATN

Multivariate Tests of Significance (S = 1, M = 14 1/2, N = 34)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.29808	.95894	31.00	70.00	.539
Hotellings	.42467	.95894	31.00	70.00	.539
Wilks	.70192	.95894	31.00	70.00	.539
Rois	.29808				

Note.. F statistics are exact.

EFFECT .. EDUCATN (Cont.)

Univariate F-tests with (1,100) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
IACCRD	.31505	153.64574	.31505	1.53646	.20505	.652
IATTCITY	.32188	81.25655	.32188	.81257	.39613	.531
ICLIMATE	.03450	71.33805	.03450	.71338	.04837	.826
ICOSTLIV	.40964	87.05114	.40964	.87051	.47057	.494
ICRIMELV	1.53681	95.71809	1.53681	.95718	1.60556	.208
IENGUTIL	.03229	106.48732	.03229	1.06487	.03032	.862
IEXPMGR	.00092	118.08732	.00092	1.18087	.00078	.978
IGOVINC	.53715	134.25696	.53715	1.34257	.40009	.528
IGOVREGU	.58864	141.37214	.58864	1.41372	.41638	.520
IGVTATT	1.60258	82.48565	1.60258	.82486	1.94286	.166
IHARDWRK	.93141	138.32349	.93141	1.38323	.67336	.414
IHOUSEFAC	1.06862	116.18628	1.06862	1.16186	.91975	.340
IINFRAST	.31960	101.75884	.31960	1.01759	.31407	.576
ILABCOST	.98276	127.77214	.98276	1.27772	.76915	.383
ILABSKIL	.00132	119.64574	.00132	1.19646	.00110	.974
ILEADCO	.00180	135.85114	.00180	1.35851	.00132	.971
ILOCREGU	.06784	128.13805	.06784	1.28138	.05294	.818
ILOCTAX	.75725	92.70353	.75725	.92704	.81685	.368
IPCOMPS	1.99177	106.09647	1.99177	1.06096	1.87732	.174
IPCUST	2.23831	109.96757	2.23831	1.09968	2.03543	.157
IPOTHROP	.16965	127.83035	.16965	1.27830	.13271	.716
IPRV TAX	.32418	108.38170	.32418	1.08382	.29911	.586
IPSUPP	.92752	134.21954	.92752	1.34220	.69104	.408
IPURBAN	.49937	114.87318	.49937	1.14873	.43471	.511
IQUALLIF	.79640	75.87027	.79640	.75870	1.04968	.308
ISITES	.00528	154.58295	.00528	1.54583	.00342	.953
ISIZEMKT	4.10915	132.20457	4.10915	1.32205	3.10818	.081
ITECHADV	.00007	125.01954	.00007	1.25020	.00005	.994
ITECHSRV	.18495	100.72682	.18495	1.00727	.18361	.669
IUNIVRC	1.85734	128.81913	1.85734	1.28819	1.44182	.233
IVENTCAP	.91975	146.89397	.91975	1.46894	.62614	.431

Appendix I - Canadian and American views on the importance of information sources - MANOVA

* * * * * A n a l y s i s o f V a r i a n c e -- design 1 * * *

EFFECT .. COUNTRY

Multivariate Tests of Significance (S = 1, M = 9 , N = 64 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.13749	1.04411	20.00	131.00	.417
Hotellings	.15941	1.04411	20.00	131.00	.417
Wilks	.86251	1.04411	20.00	131.00	.417
Roys	.13749				

Note.. F statistics are exact.

EFFECT .. COUNTRY (Cont.)

Univariate F-tests with (1,150) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
BPARTNER	.19280	163.80062	.19280	1.09200	.17656	.675
BUSMAGS	.03756	160.90323	.03756	1.07269	.03502	.852
BUSVISIT	.43452	182.38126	.43452	1.21588	.35738	.551
CUSTOMER	.94334	151.99745	.94334	1.01332	.93094	.336
COMPREGN	.14271	158.06124	.14271	1.05374	.13543	.713
CHOFCOMM	.93062	176.95754	.93062	1.17972	.78885	.376
INTERNET	.30578	196.21396	.30578	1.30809	.23376	.629
OWNSURVY	.00461	189.54802	.00461	1.26365	.00365	.952
EDUCINST	3.54302	199.29251	3.54302	1.32862	2.66670	.105
OTHRCOMP	1.78753	162.89010	1.78753	1.08593	1.64607	.201
LOCSTATS	.20254	136.68562	.20254	.91124	.22227	.638
LOCLDEPT	.20451	152.47312	.20451	1.01649	.20120	.654
NATLDEPT	.01247	161.75068	.01247	1.07834	.01157	.914
OUTCONSU	1.31185	190.03025	1.31185	1.26687	1.03551	.311
SUPPDIST	.00711	166.46000	.00711	1.10973	.00641	.936
REALEST	5.77684	154.05868	5.77684	1.02706	5.62465	.019
PLEASVST	1.82284	138.17059	1.82284	.92114	1.97890	.162
LLAWFIRM	1.99527	129.87315	1.99527	.86582	2.30448	.131
INVPROMO	.01698	125.66065	.01698	.83774	.02027	.887
INVTMISS	.83398	157.03445	.83398	1.04690	.79662	.374

Appendix J - Respondents with total or minor responsibility and their evaluation of the importance of information sources - MANOVA

EFFECT .. TOTMAJR

Multivariate Tests of Significance (S = 1, M = 9 , N = 63 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.10522	.75847	20.00	129.00	.758
Hotellings	.11759	.75847	20.00	129.00	.758
Wilks	.89478	.75847	20.00	129.00	.758
Roys	.10522				

Note.. F statistics are exact.

EFFECT .. TOTMAJR (Cont.)

Univariate F-tests with (1,148) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
BPARTNER	1.37969	160.99364	1.37969	1.08779	1.26834	.262
BUSMAGS	.52633	158.41367	.52633	1.07036	.49173	.484
BUSVISIT	.04749	179.92585	.04749	1.21572	.03906	.844
CHOFCOMM	.86511	176.46822	.86511	1.19235	.72555	.396
COMPREGN	.67867	156.65466	.67867	1.05848	.64118	.425
CUSTOMER	.75515	152.18485	.75515	1.02828	.73438	.393
EDUCINST	2.43340	200.23994	2.43340	1.35297	1.79856	.182
INTERNET	.12492	194.24841	.12492	1.31249	.09518	.758
INVPROMO	.24696	124.92638	.24696	.84410	.29257	.589
INVTMISS	.34492	156.74841	.34492	1.05911	.32567	.569
LLAWFIRM	.13449	131.20551	.13449	.88652	.15171	.697
LOCLDEPT	.48477	150.18856	.48477	1.01479	.47771	.491
LOCSTATS	.49969	134.99364	.49969	.91212	.54783	.460
NATLDEPT	1.56667	158.19333	1.56667	1.06887	1.46572	.228
OWNSURVY	.01187	188.98146	.01187	1.27690	.00930	.923
OUTCONSU	4.07910	187.25424	4.07910	1.26523	3.22399	.075
OTHRCOMP	.00636	163.99364	.00636	1.10807	.00574	.940
PLEASVST	.01306	139.46028	.01306	.94230	.01386	.906
REALEST	.93571	158.45763	.93571	1.07066	.87395	.351
SUPPDIST	.00071	165.33263	.00071	1.11711	.00063	.980

Appendix K - Doubly Multivariate Analysis of Regional Differences

A) ALL RESPONDENTS

164 cases accepted.

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION
 AVERAGED Multivariate Tests of Significance (S = 4, M = 13 1/2, N = 309 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	1.63777	13.51970	128.00	2496.00	.000
Hotellings	4.04203	19.56280	128.00	2478.00	.000
Wilks	.08962	16.10853	128.00	2473.10	.000
Roys	.72424				

 EFFECT .. REGION (Cont.)
 Univariate F-tests with (4,652) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
ACCRD	130.66306	389.35444	32.66577	.59717	54.70100	.000
ASSESSG	78.81009	308.72998	19.70252	.47351	41.60932	.000
ASSESSI	42.48856	779.01593	10.62214	1.19481	8.89024	.000
CLIMATE	467.01919	382.40161	116.75480	.58651	199.06853	.000
COSTLIV	240.17137	408.61471	60.04284	.62671	95.80647	.000
CRIMELV	225.98707	433.99427	56.49677	.66564	84.87645	.000
ENGUTIL	39.66659	323.19515	9.91665	.49570	20.00542	.000
EXPMGR	105.91434	392.49199	26.47858	.60198	43.98571	.000
GOVATT	63.04036	338.74019	15.76009	.51954	30.33469	.000
GOVINC	25.15219	334.52149	6.28805	.51307	12.25574	.000
HARDWRK	4.58509	325.11614	1.14627	.49864	2.29878	.058
HOUSFAC	12.95423	380.16805	3.23856	.58308	5.55423	.000
INFRAST	26.10189	283.62070	6.52547	.43500	15.00105	.000
LABCOST	161.80399	467.57312	40.45100	.71714	56.40626	.000
LABSKIL	64.40931	369.92826	16.10233	.56737	28.38042	.000
LEADCO	195.25610	430.00881	48.81402	.65952	74.01417	.000
LOCREGU	22.33822	239.17866	5.58455	.36684	15.22347	.000
LOCTAX	58.38509	278.80482	14.59627	.42761	34.13417	.000
NATTAX	38.71735	291.76787	9.67934	.44750	21.62997	.000
PCOMPS	152.92303	508.28234	38.23076	.77957	49.04057	.000
PCUST	154.08772	601.38913	38.52193	.92238	41.76381	.000
POTHRUP	6.23461	1036.52020	1.55865	1.58975	.98044	.417
PSUPP	159.19131	457.47236	39.79783	.70164	56.72077	.000
PURBAN	204.26962	439.80375	51.06741	.67455	75.70638	.000
QUALLIF	21.74426	340.51487	5.43607	.52226	10.40869	.000
SITES	77.44337	395.08444	19.36084	.60596	31.95082	.000
SIZEMKT	195.84458	499.87471	48.96115	.76668	63.86134	.000
TECHADV	130.21069	347.01038	32.55267	.53222	61.16342	.000
TECHSRV	95.63611	355.77007	23.90903	.54566	43.81674	.000
UNIVRC	102.28464	394.59040	25.57116	.60520	42.25241	.000
VENTCAP	206.42401	411.59634	51.60600	.63128	81.74784	.000
USREGU	15.22656	228.97463	3.80664	.35119	10.83932	.000

Respondents on all five regions
Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.79281	15.78395	32.00	132.00	.000
Hotellings	3.82641	15.78395	32.00	132.00	.000
Wilks	.20719	15.78395	32.00	132.00	.000
Roys	.79281				

Note.. F statistics are exact.

 EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	27.07703	87.72831	27.07703	.53821	50.30937	.000
T4	9.33111	72.14442	9.33111	.44260	21.08230	.000
T6	6.69015	196.99685	6.69015	1.20857	5.53560	.020
T8	23.31485	77.19572	23.31485	.47359	49.22969	.000
T10	175.46922	121.36147	175.46922	.74455	235.67185	.000
T12	36.58029	83.16476	36.58029	.51021	71.69607	.000
T14	27.74481	111.93555	27.74481	.68672	40.40186	.000
T16	13.52300	107.30214	13.52300	.65830	20.54244	.000
T18	.20469	75.33666	.20469	.46219	.44287	.507
T20	23.87779	81.03396	23.87779	.49714	48.03023	.000
T22	2.26282	88.04276	2.26282	.54014	4.18932	.042
T24	2.13494	116.90045	2.13494	.71718	2.97685	.086
T26	.06382	76.49126	.06382	.46927	.13600	.713
T28	121.45369	144.19370	121.45369	.88462	137.29414	.000
T30	18.14897	89.09956	18.14897	.54662	33.20198	.000
T32	54.56368	112.90974	54.56368	.69270	78.76982	.000
T34	11.98961	72.74276	11.98961	.44627	26.86600	.000
T36	19.47986	78.29331	19.47986	.48033	40.55542	.000
T38	9.83314	62.31629	9.83314	.38231	25.72042	.000
T40	49.69761	144.52360	49.69761	.88665	56.05113	.000
T42	28.49256	155.46429	28.49256	.95377	29.87366	.000
T44	.07806	233.27268	.07806	1.43112	.05454	.816
T46	58.24200	124.36619	58.24200	.76298	76.33462	.000
T48	79.82423	94.71071	79.82423	.58105	137.37992	.000
T50	5.51557	73.53012	5.51557	.45111	12.22680	.001
T52	.11531	100.37344	.11531	.61579	.18726	.666
T54	47.55199	122.91201	47.55199	.75406	63.06116	.000
T56	39.18979	75.42988	39.18979	.46276	84.68708	.000
T58	13.92464	77.63304	13.92464	.47628	29.23647	.000
T60	13.82099	93.28462	13.82099	.57230	24.14998	.000
T62	49.11507	97.56577	49.11507	.59856	82.05497	.000
T64	1.22210	39.53450	1.22210	.24254	5.03871	.026

All respondents on Palo Alto -- Raleigh

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.85845	25.01568	32.00	132.00	.000
Hotellings	6.06441	25.01568	32.00	132.00	.000
Wilks	.14155	25.01568	32.00	132.00	.000
Roys	.85845				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	69.66266	87.66610	69.66266	.53783	129.52571	.000
T4	35.19761	72.04118	35.19761	.44197	79.63793	.000
T6	15.95382	206.04840	15.95382	1.26410	12.62069	.000
T8	330.65599	120.93306	330.65599	.74192	445.67570	.000
T10	120.58468	122.69207	120.58468	.75271	160.20028	.000
T12	134.11938	142.49395	134.11938	.87420	153.42025	.000
T14	20.30293	91.31866	20.30293	.56024	36.23988	.000
T16	35.51472	117.70566	35.51472	.72212	49.18115	.000
T18	24.35952	115.96880	24.35952	.71147	34.23853	.000
T20	4.09585	114.28168	4.09585	.70111	5.84191	.017
T22	.77082	98.22196	.77082	.60259	1.27919	.260
T24	10.52405	109.96517	10.52405	.67463	15.59967	.000
T26	5.69452	79.14732	5.69452	.48557	11.72759	.001
T28	71.16557	165.29905	71.16557	1.01410	70.17576	.000
T30	27.34951	101.21878	27.34951	.62097	44.04291	.000
T32	66.73178	97.28716	66.73178	.59685	111.80592	.000
T34	.09739	76.32462	.09739	.46825	.20799	.649
T36	5.79391	88.48217	5.79391	.54284	10.67341	.001
T38	4.93506	102.34047	4.93506	.62786	7.86018	.006
T40	74.91253	142.53503	74.91253	.87445	85.66835	.000
T42	60.65513	175.55239	60.65513	1.07701	56.31816	.000
T44	3.18346	333.01382	3.18346	2.04303	1.55820	.214
T46	100.43879	116.17093	100.43879	.71271	140.92616	.000
T48	84.60919	109.65079	84.60919	.67270	125.77472	.000
T50	7.45517	112.74014	7.45517	.69166	10.77870	.001
T52	20.15976	108.36042	20.15976	.66479	30.32510	.000
T54	85.87220	157.18256	85.87220	.96431	89.05039	.000
T56	70.36326	76.97091	70.36326	.47221	149.00709	.000
T58	34.68718	90.34585	34.68718	.55427	62.58185	.000
T60	65.11670	90.14669	65.11670	.55305	117.74167	.000
T62	115.33681	143.43253	115.33681	.87995	131.07138	.000
T64	3.58389	75.48016	3.58389	.46307	7.73943	.006

All respondents on Palo Alto -- Ottawa

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.85586	24.49209	32.00	132.00	.000
Hotellings	5.93748	24.49209	32.00	132.00	.000
Wilks	.14414	24.49209	32.00	132.00	.000
Roys	.85586				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	92.35026	113.75497	92.35026	.69788	132.32910	.000
T4	70.15263	89.65234	70.15263	.55001	127.54692	.000
T6	40.28726	222.05341	40.28726	1.36229	29.57317	.000
T8	237.87564	135.17542	237.87564	.82930	286.84009	.000
T10	135.42343	120.10623	135.42343	.73685	183.78747	.000
T12	98.17120	145.30100	98.17120	.89142	110.12935	.000
T14	8.31044	103.38181	8.31044	.63424	13.10290	.000
T16	85.30039	114.72683	85.30039	.70385	121.19190	.000
T18	29.67441	106.31766	29.67441	.65226	45.49507	.000
T20	2.17203	109.90386	2.17203	.67426	3.22137	.075
T22	.01041	98.13106	.01041	.60203	.01729	.896
T24	.98874	135.06340	.98874	.82861	1.19325	.276
T26	19.80466	82.32783	19.80466	.50508	39.21104	.000
T28	75.10977	147.84673	75.10977	.90704	82.80800	.000
T30	58.66258	110.56035	58.66258	.67828	86.48671	.000
T32	169.15075	126.32975	169.15075	.77503	218.25083	.000
T34	.48054	71.40325	.48054	.43806	1.09698	.296
T36	3.85450	78.89121	3.85450	.48400	7.96392	.005
T38	5.00822	105.54823	5.00822	.64754	7.73429	.006
T40	111.80016	152.51765	111.80016	.93569	119.48405	.000
T42	94.07688	200.76000	94.07688	1.23166	76.38240	.000
T44	.00088	328.31882	.00088	2.01423	.00044	.983
T46	99.93397	149.67914	99.93397	.91828	108.82771	.000
T48	75.11554	140.36638	75.11554	.86114	87.22768	.000
T50	.04419	130.67903	.04419	.80171	.05513	.815
T52	52.17019	112.75245	52.17019	.69173	75.41957	.000
T54	122.63306	152.74271	122.63306	.93707	130.86837	.000
T56	100.41128	104.39081	100.41128	.64043	156.78621	.000
T58	83.75456	103.35769	83.75456	.63410	132.08493	.000
T60	34.99681	121.80043	34.99681	.74724	46.83464	.000
T62	143.00552	149.01274	143.00552	.91419	156.42891	.000
T64	5.12768	81.51872	5.12768	.50011	10.25301	.002

All respondnets on Palo Alto -- CTT

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.78710	15.25068	32.00	132.00	.000
Hotellings	3.69713	15.25068	32.00	132.00	.000
Wilks	.21290	15.25068	32.00	132.00	.000
Rois	.78710				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	4.81990	55.46826	4.81990	.34030	14.16385	.000
T4	15.99099	45.68712	15.99099	.28029	57.05180	.000
T6	8.32433	137.21134	8.32433	.84179	9.88887	.002
T8	177.29426	105.46687	177.29426	.64704	274.00987	.000
T10	29.15215	71.90688	29.15215	.44115	66.08271	.000
T12	.15532	75.73593	.15532	.46464	.33429	.564
T14	1.13802	63.91139	1.13802	.39209	2.90240	.090
T16	2.63484	68.96516	2.63484	.42310	6.22748	.014
T18	16.30573	78.04214	16.30573	.47879	34.05640	.000
T20	4.68202	42.94492	4.68202	.26347	17.77089	.000
T22	.13953	68.93187	.13953	.42289	.32994	.566
T24	6.32525	87.44067	6.32525	.53645	11.79103	.001
T26	4.11068	56.34209	4.11068	.34566	11.89235	.001
T28	11.15167	73.27173	11.15167	.44952	24.80797	.000
T30	8.34256	87.16602	8.34256	.53476	15.60054	.000
T32	11.64097	60.90230	11.64097	.37363	31.15609	.000
T34	.05835	46.48798	.05835	.28520	.20459	.652
T36	.07490	49.96387	.07490	.30653	.24435	.622
T38	.24012	46.71913	.24012	.28662	.83775	.361
T40	6.69169	92.88832	6.69169	.56987	11.74255	.001
T42	.04900	101.09000	.04900	.62018	.07900	.779
T44	2.60246	204.81276	2.60246	1.25652	2.07117	.152
T46	9.12676	93.34827	9.12676	.57269	15.93669	.000
T48	.31134	60.47999	.31134	.37104	.83909	.361
T50	1.30001	56.37352	1.30001	.34585	3.75889	.054
T52	1.47188	84.00495	1.47188	.51537	2.85597	.093
T54	.93148	91.95664	.93148	.56415	1.65112	.201
T56	9.92530	46.85097	9.92530	.28743	34.53127	.000
T58	6.67994	76.05417	6.67994	.46659	14.31651	.000
T60	.00026	60.49751	.00026	.37115	.00069	.979
T62	8.42803	75.99575	8.42803	.46623	18.07691	.000
T64	.43644	28.11447	.43644	.17248	2.53034	.114

All respondents on Palo Alto -- Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.75653	12.81738	32.00	132.00	.000
Hotellings	3.10724	12.81738	32.00	132.00	.000
Wilks	.24347	12.81738	32.00	132.00	.000
Roys	.75653				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	9.87755	101.52546	9.87755	.62286	15.85849	.000
T4	8.28330	83.17398	8.28330	.51027	16.23317	.000
T6	1.98159	207.15871	1.98159	1.27091	1.55919	.214
T8	178.36679	111.66158	178.36679	.68504	260.37412	.000
T10	5.13192	97.02168	5.13192	.59523	8.62181	.004
T12	30.61219	109.70361	30.61219	.67303	45.48425	.000
T14	.57982	86.28934	.57982	.52938	1.09527	.297
T16	5.20780	98.61390	5.20780	.60499	8.60803	.004
T18	29.03015	101.00470	29.03015	.61966	46.84846	.000
T20	8.19488	104.05290	8.19488	.63836	12.83737	.000
T22	.39225	84.86707	.39225	.52066	.75338	.387
T24	3.17887	95.28630	3.17887	.58458	5.43788	.021
T26	4.55264	70.21465	4.55264	.43076	10.56874	.001
T28	6.68033	134.11766	6.68033	.82281	8.11895	.005
T30	.93996	73.53832	.93996	.45116	2.08345	.151
T32	.61188	131.22014	.61188	.80503	.76007	.385
T34	14.24820	68.29032	14.24820	.41896	34.00856	.000
T36	46.52131	89.37342	46.52131	.54830	84.84595	.000
T38	28.70048	87.50135	28.70048	.53682	53.46406	.000
T40	2.57779	123.69681	2.57779	.75888	3.39685	.067
T42	6.00396	154.33791	6.00396	.94686	6.34093	.013
T44	2.26454	273.84406	2.26454	1.68002	1.34792	.247
T46	5.71340	95.55194	5.71340	.58621	9.74636	.002
T48	.06964	88.86387	.06964	.54518	.12773	.721
T50	.14584	96.09042	.14584	.58951	.24739	.620
T52	17.22569	106.90625	17.22569	.65587	26.26402	.000
T54	5.62131	134.64091	5.62131	.82602	6.80531	.010
T56	4.52884	96.04464	4.52884	.58923	7.68601	.006
T58	4.65700	82.58278	4.65700	.50664	9.19189	.003
T60	18.93845	95.14600	18.93845	.58372	32.44452	.000
T62	13.92247	96.25141	13.92247	.59050	23.57745	.000
T64	8.99162	75.69627	8.99162	.46439	19.36204	.000

All respondents on Raleigh -- Ottawa

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.72268	10.74931	32.00	132.00	.000
Hotellings	2.60589	10.74931	32.00	132.00	.000
Wilks	.27732	10.74931	32.00	132.00	.000
Roys	.72268				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	19.41588	136.13116	19.41588	.83516	23.24808	.000
T4	28.31337	94.34926	28.31337	.57883	48.91485	.000
T6	14.14280	201.65968	14.14280	1.23718	11.43152	.001
T8	112.24707	109.10669	112.24707	.66937	167.69158	.000
T10	2.58992	103.28393	2.58992	.63364	4.08734	.045
T12	14.89940	120.92829	14.89940	.74189	20.08299	.000
T14	5.68609	94.77746	5.68609	.58146	9.77903	.002
T16	30.89646	112.19622	30.89646	.68832	44.88674	.000
T18	34.80824	90.38064	34.80824	.55448	62.77608	.000
T20	11.64659	103.41633	11.64659	.63446	18.35681	.000
T22	1.96627	90.47422	1.96627	.55506	3.54248	.062
T24	.21789	107.58242	.21789	.66001	.33013	.566
T26	17.61998	82.83028	17.61998	.50816	34.67399	.000
T28	5.54138	102.82397	5.54138	.63082	8.78438	.003
T30	11.55313	87.13416	11.55313	.53457	21.61219	.000
T32	31.57399	141.05810	31.57399	.86539	36.48539	.000
T34	17.27077	72.25567	17.27077	.44329	38.96075	.000
T36	40.66469	78.63374	40.66469	.48242	84.29389	.000
T38	28.87653	91.36767	28.87653	.56054	51.51576	.000
T40	12.41791	134.45771	12.41791	.82489	15.05395	.000
T42	19.02252	174.44810	19.02252	1.07023	17.77417	.000
T44	.06238	263.91758	.06238	1.61913	.03853	.845
T46	5.59348	115.18824	5.59348	.70668	7.91519	.006
T48	.07157	160.14693	.07157	.98250	.07284	.788
T50	4.57232	93.68209	4.57232	.57474	7.95551	.005
T52	47.38004	126.79307	47.38004	.77787	60.90985	.000
T54	17.45724	127.82018	17.45724	.78417	22.26198	.000
T56	14.14037	122.45526	14.14037	.75126	18.82222	.000
T58	29.37833	105.51964	29.37833	.64736	45.38177	.000
T60	4.83186	161.19627	4.83186	.98893	4.88593	.028
T62	24.50524	77.56444	24.50524	.47586	51.49724	.000
T64	11.35640	82.92352	11.35640	.50873	22.32291	.000

All respondents on Raleigh -- CTT

* * * * * A n a l y s i s o f V a r i a n c e -- design 1 * * *

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.73823	11.63324	32.00	132.00	.000
Hotellings	2.82018	11.63324	32.00	132.00	.000
Wilks	.26177	11.63324	32.00	132.00	.000
Roys	.73823				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	9.04885	96.14058	9.04885	.58982	15.34173	.000
T4	.89149	88.17782	.89149	.54097	1.64796	.201
T6	.08920	215.38159	.08920	1.32136	.06750	.795
T8	72.02312	101.33684	72.02312	.62170	115.84896	.000
T10	61.57864	107.36487	61.57864	.65868	93.48793	.000
T12	31.96834	91.11088	31.96834	.55896	57.19229	.000
T14	17.64468	83.95437	17.64468	.51506	34.25768	.000
T16	4.21950	96.60237	4.21950	.59265	7.11969	.008
T18	20.16426	74.46229	20.16426	.45682	44.14012	.000
T20	7.41306	62.30336	7.41306	.38223	19.39427	.000
T22	3.52614	71.67895	3.52614	.43975	8.01854	.005
T24	1.11063	81.43417	1.11063	.49960	2.22305	.138
T26	3.15010	69.81687	3.15010	.42832	7.35447	.007
T28	59.00069	101.04386	59.00069	.61990	95.17761	.000
T30	1.88187	93.00623	1.88187	.57059	3.29810	.071
T32	15.79933	96.02597	15.79933	.58912	26.81869	.000
T34	10.37512	62.72866	10.37512	.38484	26.95967	.000
T36	21.97055	72.93373	21.97055	.44745	49.10211	.000
T38	13.14643	57.33510	13.14643	.35175	37.37445	.000
T40	19.91680	110.34519	19.91680	.67696	29.42074	.000
T42	26.17846	115.46879	26.17846	.70840	36.95447	.000
T44	1.77910	217.04030	1.77910	1.33154	1.33613	.249
T46	21.25755	106.09544	21.25755	.65089	32.65910	.000
T48	90.10599	85.43999	90.10599	.52417	171.90166	.000
T50	12.17107	65.45789	12.17107	.40158	30.30780	.000
T52	.76323	88.81166	.76323	.54486	1.40080	.238
T54	35.17275	96.61136	35.17275	.59271	59.34248	.000
T56	9.67043	69.94493	9.67043	.42911	22.53601	.000
T58	1.31564	78.92556	1.31564	.48421	2.71712	.101
T60	13.70216	77.56123	13.70216	.47584	28.79599	.000
T62	16.85191	80.37333	16.85191	.49309	34.17628	.000
T64	3.11918	30.59279	3.11918	.18769	16.61918	.000

All respondents on Raleigh - Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.56293	5.31275	32.00	132.00	.000
Hotellings	1.28794	5.31275	32.00	132.00	.000
Wilks	.43707	5.31275	32.00	132.00	.000
Rois	.56293				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	1.59640	81.66430	1.59640	.50101	3.18638	.076
T4	5.96805	49.37489	5.96805	.30291	19.70217	.000
T6	5.53662	145.83591	5.53662	.89470	6.18825	.014
T8	7.62164	56.03185	7.62164	.34375	22.17180	.000
T10	.43040	59.22457	.43040	.36334	1.18457	.278
T12	2.79844	52.97006	2.79844	.32497	8.61139	.004
T14	2.63443	34.60035	2.63443	.21227	12.41064	.001
T16	10.73478	56.93900	10.73478	.34932	30.73060	.000
T18	.26203	48.75361	.26203	.29910	.87605	.351
T20	.30254	37.92047	.30254	.23264	1.30047	.256
T22	.60208	50.04542	.60208	.30703	1.96100	.163
T24	5.06127	42.29730	5.06127	.25949	19.50449	.000
T26	4.25978	61.68841	4.25978	.37846	11.25566	.001
T28	.05319	69.88514	.05319	.42874	.12405	.725
T30	5.90235	57.37399	5.90235	.35199	16.76862	.000
T32	23.39507	78.00185	23.39507	.47854	48.88853	.000
T34	.14526	21.34562	.14526	.13095	1.10926	.294
T36	.19693	34.95230	.19693	.21443	.91837	.339
T38	.00027	22.59406	.00027	.13861	.00194	.965
T40	3.68010	102.65280	3.68010	.62977	5.84354	.017
T42	3.65262	105.88266	3.65262	.64959	5.62299	.019
T44	3.07863	213.87146	3.07863	1.31209	2.34635	.128
T46	.00064	102.05228	.00064	.62609	.00102	.975
T48	.28239	135.68136	.28239	.83240	.33925	.561
T50	6.35136	47.82871	6.35136	.29343	21.64539	.000
T52	7.46891	57.06813	7.46891	.35011	21.33298	.000
T54	3.26617	96.14494	3.26617	.58985	5.53733	.020
T56	2.66428	76.54025	2.66428	.46957	5.67384	.018
T58	10.64175	68.42422	10.64175	.41978	25.35074	.000
T60	4.63835	96.77981	4.63835	.59374	7.81207	.006
T62	1.48595	60.62073	1.48595	.37191	3.99549	.047
T64	.13788	19.38757	.13788	.11894	1.15923	.283

All respondnets on Ottawa -- CTT

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.77445	14.16343	32.00	132.00	.000
Hotellings	3.43356	14.16343	32.00	132.00	.000
Wilks	.22555	14.16343	32.00	132.00	.000
Roys	.77445				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	37.83466	98.95135	37.83466	.60706	62.32405	.000
T4	3.73990	81.52576	3.73990	.50016	7.47745	.007
T6	1.22995	205.31072	1.22995	1.25957	.97648	.325
T8	23.70482	64.93563	23.70482	.39838	59.50332	.000
T10	31.15685	99.98769	31.15685	.61342	50.79192	.000
T12	125.14636	127.44923	125.14636	.78190	160.05477	.000
T14	11.82740	62.75363	11.82740	.38499	30.72119	.000
T16	18.80266	99.60185	18.80266	.61105	30.77084	.000
T18	.80551	88.58078	.80551	.54344	1.48224	.225
T20	.01959	92.12505	.01959	.56518	.03467	.853
T22	1.56625	74.63705	1.56625	.45790	3.42054	.066
T24	.53155	77.71077	.53155	.47675	1.11494	.293
T26	.12877	64.53858	.12877	.39594	.32521	.569
T28	25.97489	109.10321	25.97489	.66934	38.80644	.000
T30	5.48181	107.07459	5.48181	.65690	8.34498	.004
T32	22.62968	105.28430	22.62968	.64592	35.03502	.000
T34	.30651	50.46205	.30651	.30958	.99008	.321
T36	4.55130	63.84256	4.55130	.39167	11.62017	.001
T38	2.99803	76.86582	2.99803	.47157	6.35756	.013
T40	36.82514	126.96178	36.82514	.77891	47.27799	.000
T42	57.25626	151.46456	57.25626	.92923	61.61686	.000
T44	.02924	245.86195	.02924	1.50836	.01939	.889
T46	49.01208	112.77125	49.01208	.69185	70.84224	.000
T48	95.18543	96.84001	95.18543	.59411	160.21503	.000
T50	14.98152	83.26692	14.98152	.51084	29.32722	.000
T52	10.73711	103.12444	10.73711	.63267	16.97123	.000
T54	68.91643	132.56015	68.91643	.81325	84.74175	.000
T56	27.43494	91.75472	27.43494	.56291	48.73749	.000
T58	10.92319	102.23312	10.92319	.62720	17.41588	.000
T60	64.85847	80.33859	64.85847	.49287	131.59217	.000
T62	61.40902	126.95192	61.40902	.77885	78.84615	.000
T64	1.51901	66.93171	1.51901	.41062	3.69928	.056

All respondents on Ottawa -- Boston

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 65)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.70823	10.01266	32.00	132.00	.000
Hotellings	2.42731	10.01266	32.00	132.00	.000
Wilks	.29177	10.01266	32.00	132.00	.000
Roys	.70823				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,163) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	54.97446	114.35561	54.97446	.70157	78.35940	.000
T4	19.15675	95.69820	19.15675	.58711	32.62915	.000
T6	11.98568	209.88322	11.98568	1.28763	9.30835	.003
T8	4.44378	74.16036	4.44378	.45497	9.76717	.002
T10	38.91120	118.58738	38.91120	.72753	53.48398	.000
T12	90.51675	136.12796	90.51675	.83514	108.38501	.000
T14	3.29787	75.06531	3.29787	.46052	7.16115	.008
T16	57.95169	108.57685	57.95169	.66612	86.99945	.000
T18	1.98637	68.00320	1.98637	.41720	4.76123	.031
T20	.47612	88.32119	.47612	.54185	.87870	.350
T22	.22616	87.76000	.22616	.53840	.42005	.518
T24	2.31238	96.73946	2.31238	.59349	3.89622	.050
T26	5.86978	65.65445	5.86978	.40279	14.57288	.000
T28	28.37882	121.34775	28.37882	.74446	38.11976	.000
T30	22.76054	118.64865	22.76054	.72791	31.26853	.000
T32	92.04312	126.00272	92.04312	.77302	119.06909	.000
T34	.87379	55.90572	.87379	.34298	2.54765	.112
T36	2.85479	61.64574	2.85479	.37819	7.54846	.007
T38	3.05511	76.83155	3.05511	.47136	6.48150	.012
T40	63.78785	140.12695	63.78785	.85967	74.20000	.000
T42	89.83191	169.00413	89.83191	1.03684	86.64049	.000
T44	2.50777	277.34704	2.50777	1.70152	1.47384	.226
T46	48.65962	128.45722	48.65962	.78808	61.74444	.000
T48	85.09876	127.32936	85.09876	.78116	108.93872	.000
T50	1.82360	91.63832	1.82360	.56220	3.24369	.074
T52	36.11631	99.51630	36.11631	.61053	59.15572	.000
T54	102.18881	137.11534	102.18881	.84120	121.48003	.000
T56	47.19826	107.14358	47.19826	.65732	71.80380	.000
T58	43.12803	104.34910	43.12803	.64018	67.36876	.000
T60	34.80756	109.72483	34.80756	.67316	51.70782	.000
T62	82.00000	121.22222	82.00000	.74369	110.26031	.000
T64	2.57219	72.25687	2.57219	.44329	5.80245	.017

All respondents on CTT -- Boston

B) AMERICANS

62 cases accepted.

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

AVERAGED Multivariate Tests of Significance (S = 4, M = 13 1/2, N = 105 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	1.92978	6.29208	128.00	864.00	.000
Hotellings	5.71251	9.43904	128.00	846.00	.000
Wilks	.04674	7.70170	128.00	850.00	.000
Roys	.77646				

EFFECT .. REGION (Cont.)

Univariate F-tests with (4,244) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
ACCRD	132.97090	131.47034	33.24273	.53881	61.69623	.000
ASSESSG	80.19209	120.23513	20.04802	.49277	40.68459	.000
ASSESSI	99.39047	264.29637	24.84762	1.08318	22.93947	.000
CLIMATE	232.85244	182.98942	58.21311	.74996	77.62197	.000
COSTLIV	122.54466	138.49600	30.63616	.56761	53.97430	.000
CRIMELV	38.50445	131.56918	9.62611	.53922	17.85199	.000
ENGUTIL	28.55782	132.29649	7.13945	.54220	13.16760	.000
EXPMGR	99.89689	144.42330	24.97422	.59190	42.19340	.000
GOVATT	35.72100	122.77156	8.93025	.50316	17.74825	.000
GOVINC	16.41176	123.95643	4.10294	.50802	8.07636	.000
HARDWRK	16.28353	129.38190	4.07088	.53025	7.67723	.000
HOUSFAC	27.02937	148.67637	6.75734	.60933	11.08980	.000
INFRAST	29.67735	106.45739	7.41934	.43630	17.00510	.000
LABCOST	77.18044	185.41958	19.29511	.75992	25.39110	.000
LABSKIL	64.44938	130.23041	16.11234	.53373	30.18813	.000
LEADCO	173.71455	154.88385	43.42864	.63477	68.41635	.000
LOCREGU	24.19689	95.98220	6.04922	.39337	15.37796	.000
LOCTAX	32.18380	106.14224	8.04595	.43501	18.49605	.000
NATTAX	18.73565	105.87940	4.68391	.43393	10.79412	.000
PCOMPS	140.22358	157.31672	35.05590	.64474	54.37209	.000
PCUST	138.81085	182.16200	34.70271	.74657	46.48314	.000
POTHROP	90.95346	302.22362	22.73837	1.23862	18.35780	.000
PSUPP	117.00324	148.45037	29.25081	.60840	48.07801	.000
PURBAN	131.84472	163.25619	32.96118	.66908	49.26324	.000
QUALLIF	28.88842	103.93192	7.22211	.42595	16.95527	.000
SITES	87.30317	140.05023	21.82579	.57398	38.02559	.000
SIZEMKT	111.38242	166.28186	27.84560	.68148	40.86031	.000
TECHADV	123.73978	121.72051	30.93495	.49885	62.01195	.000
TECHSRV	109.14003	116.26253	27.28501	.47649	57.26301	.000
UNIVRC	115.47191	141.06231	28.86798	.57812	49.93387	.000
VENTCAP	136.39190	137.90216	34.09797	.56517	60.33195	.000
USREGU	13.87729	77.90805	3.46932	.31930	10.86556	.000

Americans on all five regions

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.90337	8.76397	32.00	30.00	.000
Hotellings	9.34824	8.76397	32.00	30.00	.000
Wilks	.09663	8.76397	32.00	30.00	.000
Rois	.90337				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	4.26859	33.85807	4.26859	.55505	7.69045	.007
T4	.13554	44.30955	.13554	.72639	.18659	.667
T6	.01326	117.39870	.01326	1.92457	.00689	.934
T8	4.30784	39.60381	4.30784	.64924	6.63518	.012
T10	105.68348	41.12807	105.68348	.67423	156.74678	.000
T12	17.07195	27.42432	17.07195	.44958	37.97318	.000
T14	19.06113	44.57302	19.06113	.73071	26.08593	.000
T16	4.03915	44.73889	4.03915	.73342	5.50725	.022
T18	2.67496	36.41866	2.67496	.59703	4.48047	.038
T20	15.00828	38.92939	15.00828	.63819	23.51707	.000
T22	8.81468	40.79646	8.81468	.66879	13.17995	.001
T24	2.39598	62.51699	2.39598	1.02487	2.33784	.131
T26	1.47911	31.75376	1.47911	.52055	2.84142	.097
T28	62.19019	60.82478	62.19019	.99713	62.36934	.000
T30	3.14464	28.64799	3.14464	.46964	6.69586	.012
T32	10.44635	54.77138	10.44635	.89789	11.63431	.001
T34	15.38949	33.87132	15.38949	.55527	27.71545	.000
T36	16.22121	34.68540	16.22121	.56861	28.52768	.000
T38	8.27489	34.05226	8.27489	.55823	14.82334	.000
T40	9.52800	61.61931	9.52800	1.01015	9.43224	.003
T42	11.30148	61.56340	11.30148	1.00924	11.19806	.001
T44	.02406	131.18546	.02406	2.15058	.01119	.916
T46	16.45898	53.16386	16.45898	.87154	18.88497	.000
T48	28.74176	43.25769	28.74176	.70914	40.53030	.000
T50	1.60876	32.65806	1.60876	.53538	3.00491	.088
T52	.92546	36.26430	.92546	.59450	1.55672	.217
T54	9.86325	61.36870	9.86325	1.00604	9.80400	.003
T56	6.13386	35.69751	6.13386	.58521	10.48155	.002
T58	4.15709	23.51629	4.15709	.38551	10.78327	.002
T60	.04691	42.84410	.04691	.70236	.06679	.797
T62	24.68145	46.70884	24.68145	.76572	32.23305	.000
T64	1.30064	25.72720	1.30064	.42176	3.08386	.084

Americans on Palo Alto -- Raleigh

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.93269	12.99136	32.00	30.00	.000
Hotellings	13.85745	12.99136	32.00	30.00	.000
Wilks	.06731	12.99136	32.00	30.00	.000
Roys	.93269				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	55.54793	34.34826	55.54793	.56309	98.64906	.000
T4	29.23147	21.20861	29.23147	.34768	84.07525	.000
T6	40.43565	55.67175	40.43565	.91265	44.30568	.000
T8	138.53339	45.94420	138.53339	.75318	183.93044	.000
T10	38.94770	39.73399	38.94770	.65138	59.79288	.000
T12	14.35424	36.49257	14.35424	.59824	23.99416	.000
T14	1.65340	33.24072	1.65340	.54493	3.03415	.087
T16	40.21185	32.59651	40.21185	.53437	75.25109	.000
T18	8.40510	30.43442	8.40510	.49892	16.84642	.000
T20	1.26547	35.18383	1.26547	.57678	2.19402	.144
T22	.12826	27.99045	.12826	.45886	.27951	.599
T24	1.09794	40.91276	1.09794	.67070	1.63701	.206
T26	5.21843	27.81362	5.21843	.45596	11.44491	.001
T28	12.42250	60.62501	12.42250	.99385	12.49934	.001
T30	27.65393	35.12355	27.65393	.57580	48.02732	.000
T32	68.46864	34.38579	68.46864	.56370	121.46260	.000
T34	.08799	27.80945	.08799	.45589	.19300	.662
T36	.30129	29.70308	.30129	.48694	.61875	.435
T38	.48421	27.72954	.48421	.45458	1.06518	.306
T40	62.22581	49.74488	62.22581	.81549	76.30482	.000
T42	53.45012	40.06680	53.45012	.65683	81.37553	.000
T44	37.14512	67.32920	37.14512	1.10376	33.65334	.000
T46	54.61155	42.74240	54.61155	.70070	77.93909	.000
T48	43.63435	48.20929	43.63435	.79032	55.21126	.000
T50	2.85251	26.00584	2.85251	.42633	6.69092	.012
T52	22.15379	39.15316	22.15379	.64186	34.51525	.000
T54	48.42712	44.54717	48.42712	.73028	66.31294	.000
T56	51.48232	24.87820	51.48232	.40784	126.23187	.000
T58	39.39849	29.24161	39.39849	.47937	82.18794	.000
T60	33.12437	32.09426	33.12437	.52614	62.95788	.000
T62	71.49188	39.27839	71.49188	.64391	111.02808	.000
T64	2.79421	21.67337	2.79421	.35530	7.86434	.007

Americans on Palo Alto -- Ottawa

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.91414	9.98155	32.00	30.00	.000
Hotellings	10.64698	9.98155	32.00	30.00	.000
Wilks	.08586	9.98155	32.00	30.00	.000
Rois	.91414				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	69.53875	42.73137	69.53875	.70051	99.26814	.000
T4	49.39591	29.87464	49.39591	.48975	100.85981	.000
T6	51.91188	65.64661	51.91188	1.07617	48.23744	.000
T8	125.51915	64.22751	125.51915	1.05291	119.21166	.000
T10	41.69337	44.17351	41.69337	.72416	57.57514	.000
T12	8.08588	34.26699	8.08588	.56175	14.39399	.000
T14	.00042	35.07458	.00042	.57499	.00072	.979
T16	64.06191	44.71865	64.06191	.73309	87.38583	.000
T18	10.59772	39.71881	10.59772	.65113	16.27594	.000
T20	1.16910	47.79374	1.16910	.78350	1.49215	.227
T22	.72454	38.87396	.72454	.63728	1.13692	.291
T24	6.01962	43.39460	6.01962	.71139	8.46181	.005
T26	13.88671	25.72911	13.88671	.42179	32.92338	.000
T28	16.42539	58.80077	16.42539	.96395	17.03972	.000
T30	41.80002	49.15328	41.80002	.80579	51.87449	.000
T32	117.47322	41.98427	117.47322	.68827	170.67981	.000
T34	.07923	33.27763	.07923	.54553	.14523	.704
T36	.43827	32.39844	.43827	.53112	.82519	.367
T38	.73325	35.69947	.73325	.58524	1.25291	.267
T40	79.00839	56.56981	79.00839	.92737	85.19583	.000
T42	85.93343	54.12649	85.93343	.88732	96.84610	.000
T44	37.35989	70.37711	37.35989	1.15372	32.38202	.000
T46	63.19186	49.51134	63.19186	.81166	77.85496	.000
T48	77.80571	47.59180	77.80571	.78019	99.72617	.000
T50	14.40404	31.19069	14.40404	.51132	28.17016	.000
T52	42.29475	40.79847	42.29475	.66883	63.23716	.000
T54	59.49210	48.72268	59.49210	.79873	74.48315	.000
T56	80.90343	39.26137	80.90343	.64363	125.69887	.000
T58	71.00373	35.29749	71.00373	.57865	122.70637	.000
T60	59.89510	51.75910	59.89510	.84851	70.58857	.000
T62	87.72154	49.97120	87.72154	.81920	107.08197	.000
T64	4.64922	31.83669	4.64922	.52191	8.90803	.004

Americans on Palo Alto -- CTT

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.87113	6.33701	32.00	30.00	.000
Hotellings	6.75948	6.33701	32.00	30.00	.000
Wilks	.12887	6.33701	32.00	30.00	.000
Roys	.87113				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	.01587	14.66142	.01587	.24035	.06602	.798
T4	2.25196	20.23606	2.25196	.33174	6.78836	.012
T6	1.32749	62.75085	1.32749	1.02870	1.29045	.260
T8	76.47013	50.44035	76.47013	.82689	92.47909	.000
T10	7.82832	23.24864	7.82832	.38113	20.54003	.000
T12	.36960	36.54237	.36960	.59906	.61697	.435
T14	.00000	26.97846	.00000	.44227	.00000	.999
T16	.68544	25.68583	.68544	.42108	1.62782	.207
T18	5.75370	30.92714	5.75370	.50700	11.34847	.001
T20	2.56558	15.48323	2.56558	.25382	10.10775	.002
T22	.50570	25.11035	.50570	.41165	1.22848	.272
T24	4.00159	32.86916	4.00159	.53884	7.42631	.008
T26	1.32895	21.89512	1.32895	.35894	3.70247	.059
T28	.70314	29.38062	.70314	.48165	1.45987	.232
T30	.69235	31.84554	.69235	.52206	1.32620	.254
T32	1.47306	21.90930	1.47306	.35917	4.10130	.047
T34	.06808	15.45054	.06808	.25329	.26879	.606
T36	.22671	18.28799	.22671	.29980	.75619	.388
T38	.08726	19.41523	.08726	.31828	.27416	.602
T40	.05000	27.88395	.05000	.45711	.10939	.742
T42	.04960	33.39960	.04960	.54753	.09059	.764
T44	.08523	84.33244	.08523	1.38250	.06165	.805
T46	.00452	22.00248	.00452	.36070	.01252	.911
T48	.06458	19.42024	.06458	.31836	.20285	.654
T50	1.48982	20.67473	1.48982	.33893	4.39566	.040
T52	.03290	23.13122	.03290	.37920	.08677	.769
T54	.03530	33.37846	.03530	.54719	.06451	.800
T56	1.16257	14.83346	1.16257	.24317	4.78088	.033
T58	.40320	19.65222	.40320	.32217	1.25152	.268
T60	.15314	24.61727	.15314	.40356	.37946	.540
T62	2.22988	30.54389	2.22988	.50072	4.45335	.039
T64	.44370	13.03620	.44370	.21371	2.07618	.155

Americans on Palo Alto -- Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.89659	8.12839	32.00	30.00	.000
Hotellings	8.67028	8.12839	32.00	30.00	.000
Wilks	.10341	8.12839	32.00	30.00	.000
Roys	.89659				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	29.01969	32.29948	29.01969	.52950	54.80586	.000
T4	25.38609	20.69999	25.38609	.33934	74.80927	.000
T6	38.98425	42.77122	38.98425	.70117	55.59905	.000
T8	93.98307	47.39260	93.98307	.77693	120.96757	.000
T10	16.31706	20.85262	16.31706	.34201	47.70928	.000
T12	.11773	24.57760	.11773	.40291	.29221	.591
T14	9.48676	34.11875	9.48676	.55932	16.96113	.000
T16	18.76205	28.14027	18.76205	.46132	40.67071	.000
T18	20.56338	26.14692	20.56338	.42864	47.97378	.000
T20	7.55766	28.93019	7.55766	.47427	15.93551	.000
T22	6.81639	29.02714	6.81639	.47585	14.32451	.000
T24	6.73777	34.61343	6.73777	.56743	11.87412	.001
T26	12.25403	23.09800	12.25403	.37866	32.36194	.000
T28	19.02284	43.92092	19.02284	.72002	26.42006	.000
T30	12.14793	19.66984	12.14793	.32246	37.67309	.000
T32	25.42677	44.72907	25.42677	.73326	34.67618	.000
T34	13.15020	17.15783	13.15020	.28128	46.75195	.000
T36	20.94394	24.84063	20.94394	.40722	51.43108	.000
T38	12.76251	19.38912	12.76251	.31785	40.15206	.000
T40	23.05524	33.42923	23.05524	.54802	42.07006	.000
T42	15.59611	54.10277	15.59611	.88693	17.58436	.000
T44	35.27840	66.46973	35.27840	1.08967	32.37537	.000
T46	11.10886	29.37053	11.10886	.48148	23.07212	.000
T48	1.54877	34.46565	1.54877	.56501	2.74114	.103
T50	8.74566	23.44346	8.74566	.38432	22.75626	.000
T52	32.13521	28.10698	32.13521	.46077	69.74238	.000
T54	14.58001	44.52466	14.58001	.72991	19.97501	.000
T56	22.07548	32.04179	22.07548	.52528	42.02651	.000
T58	17.96003	29.49385	17.96003	.48351	37.14543	.000
T60	30.67825	22.16774	30.67825	.36341	84.41875	.000
T62	12.16087	23.85176	12.16087	.39101	31.10099	.000
T64	7.90759	14.89323	7.90759	.24415	32.38807	.000

Americans on Raleigh -- Ottawa

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.91780	10.46811	32.00	30.00	.000
Hotellings	11.16599	10.46811	32.00	30.00	.000
Wilks	.08220	10.46811	32.00	30.00	.000
Roys	.91780				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	39.34970	35.98641	39.34970	.58994	66.70106	.000
T4	44.35653	27.26338	44.35653	.44694	99.24480	.000
T6	50.26560	44.39345	50.26560	.72776	69.06878	.000
T8	83.32036	49.35858	83.32036	.80916	102.97181	.000
T10	14.61691	30.78626	14.61691	.50469	28.96199	.000
T12	1.65959	34.73191	1.65959	.56938	2.91476	.093
T14	18.88342	41.43572	18.88342	.67927	27.79941	.000
T16	35.92929	41.18485	35.92929	.67516	53.21586	.000
T18	23.92134	32.75417	23.92134	.53695	44.55012	.000
T20	7.79974	35.09449	7.79974	.57532	13.55723	.000
T22	14.59354	33.61516	14.59354	.55107	26.48228	.000
T24	16.01109	36.30139	16.01109	.59510	26.90466	.000
T26	24.43003	27.94305	24.43003	.45808	53.33104	.000
T28	14.69381	38.24439	14.69381	.62696	23.43671	.000
T30	22.01469	23.76504	22.01469	.38959	56.50719	.000
T32	57.85771	38.04147	57.85771	.62363	92.77561	.000
T34	17.67717	27.49450	17.67717	.45073	39.21903	.000
T36	21.99216	26.08789	21.99216	.42767	51.42316	.000
T38	13.93463	27.44683	13.93463	.44995	30.96942	.000
T40	33.66228	34.41448	33.66228	.56417	59.66672	.000
T42	34.90754	54.95794	34.90754	.90095	38.74526	.000
T44	35.48770	48.11495	35.48770	.78877	44.99121	.000
T46	15.15050	32.00142	15.15050	.52461	28.87935	.000
T48	11.96898	51.80584	11.96898	.84928	14.09315	.000
T50	25.64041	24.23424	25.64041	.39728	64.53947	.000
T52	55.73298	40.28078	55.73298	.66034	84.40033	.000
T54	20.90803	44.06242	20.90803	.72233	28.94508	.000
T56	42.48395	33.37012	42.48395	.54705	77.65991	.000
T58	40.79986	31.82239	40.79986	.52168	78.20880	.000
T60	56.58966	45.59633	56.58966	.74748	75.70716	.000
T62	19.34183	27.99532	19.34183	.45894	42.14461	.000
T64	10.86796	24.09977	10.86796	.39508	27.50838	.000

Americans on Raleigh -- CTT

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.89745	8.20398	32.00	30.00	.000
Hotellings	8.75092	8.20398	32.00	30.00	.000
Wilks	.10255	8.20398	32.00	30.00	.000
Roys	.89745				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	4.80495	39.30123	4.80495	.64428	7.45784	.008
T4	1.28256	55.08629	1.28256	.90305	1.42025	.238
T6	1.07537	124.80811	1.07537	2.04603	.52559	.471
T8	44.47804	59.39364	44.47804	.97367	45.68100	.000
T10	55.98531	39.31494	55.98531	.64451	86.86530	.000
T12	22.46540	37.24735	22.46540	.61061	36.79160	.000
T14	19.05583	43.77027	19.05583	.71755	26.55697	.000
T16	1.39677	41.37460	1.39677	.67827	2.05931	.156
T18	16.27492	39.28181	16.27492	.64396	25.27302	.000
T20	5.16339	27.88155	5.16339	.45707	11.29659	.001
T22	5.09779	32.39168	5.09779	.53101	9.60015	.003
T24	.20476	47.64505	.20476	.78107	.26215	.610
T26	5.61211	29.62309	5.61211	.48562	11.55648	.001
T28	49.66780	40.79943	49.66780	.66884	74.25927	.000
T30	.88592	33.19592	.88592	.54420	1.62795	.207
T32	4.07388	40.89342	4.07388	.67038	6.07693	.017
T34	13.41039	30.33566	13.41039	.49731	26.96607	.000
T36	20.28327	33.26597	20.28327	.54534	37.19355	.000
T38	10.06165	28.22235	10.06165	.46266	21.74733	.000
T40	8.19752	37.69329	8.19752	.61792	13.26626	.001
T42	9.85368	53.91668	9.85368	.88388	11.14821	.001
T44	.19987	131.01230	.19987	2.14774	.09306	.761
T46	15.91821	46.35478	15.91821	.75991	20.94737	.000
T48	31.53115	36.53784	31.53115	.59898	52.64132	.000
T50	6.19488	34.04932	6.19488	.55819	11.09824	.001
T52	1.30737	36.90833	1.30737	.60505	2.16074	.147
T54	11.07863	42.36465	11.07863	.69450	15.95190	.000
T56	1.95562	28.98985	1.95562	.47524	4.11499	.047
T58	1.97098	25.88247	1.97098	.42430	4.64521	.035
T60	.36955	30.01176	.36955	.49200	.75113	.390
T62	12.07398	35.60762	12.07398	.58373	20.68414	.000
T64	3.26367	14.34763	3.26367	.23521	13.87572	.000

Americans on Raleigh -- Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.66173	1.83396	32.00	30.00	.049
Hotellings	1.95622	1.83396	32.00	30.00	.049
Wilks	.33827	1.83396	32.00	30.00	.049
Rois	.66173				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	.78489	20.74182	.78489	.34003	2.30831	.134
T4	2.62962	10.59933	2.62962	.17376	15.13365	.000
T6	.71586	15.58544	.71586	.25550	2.80182	.099
T8	.32091	22.59626	.32091	.37043	.86631	.356
T10	.04676	20.29344	.04676	.33268	.14054	.709
T12	.89327	9.79289	.89327	.16054	5.56419	.022
T14	1.60136	16.09494	1.60136	.26385	6.06915	.017
T16	2.76420	19.69923	2.76420	.32294	8.55952	.005
T18	.12692	13.31624	.12692	.21830	.58141	.449
T20	.00191	7.42798	.00191	.12177	.01567	.901
T22	1.46247	21.06652	1.46247	.34535	4.23473	.044
T24	1.97589	16.87911	1.97589	.27671	7.14074	.010
T26	2.07965	23.39354	2.07965	.38350	5.42280	.023
T28	.27907	30.63212	.27907	.50217	.55573	.459
T30	1.45587	16.71121	1.45587	.27395	5.31427	.025
T32	6.57373	30.12073	6.57373	.49378	13.31301	.001
T34	.33420	5.89989	.33420	.09672	3.45538	.068
T36	.01280	11.40830	.01280	.18702	.06843	.795
T38	.02574	11.43878	.02574	.18752	.13728	.712
T40	1.00067	18.62873	1.00067	.30539	3.27669	.075
T42	3.83795	30.27154	3.83795	.49625	7.73384	.007
T44	.00031	19.02654	.00031	.31191	.00099	.975
T46	.31289	18.08552	.31289	.29648	1.05534	.308
T48	4.90678	54.36530	4.90678	.89123	5.50560	.022
T50	4.43662	14.09713	4.43662	.23110	19.19780	.000
T52	3.22799	19.47658	3.22799	.31929	10.10995	.002
T54	.56875	27.09417	.56875	.44417	1.28048	.262
T56	3.31064	23.35139	3.31064	.38281	8.64826	.005
T58	4.62056	21.92631	4.62056	.35945	12.85462	.001
T60	3.93552	30.99909	3.93552	.50818	7.74432	.007
T62	.82936	17.44723	.82936	.28602	2.89965	.094
T64	.23485	10.49390	.23485	.17203	1.36517	.247

Americans on Ottawa -- CTT

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.91089	9.58321	32.00	30.00	.000
Hotellings	10.22210	9.58321	32.00	30.00	.000
Wilks	.08911	9.58321	32.00	30.00	.000
Roys	.91089				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	57.44144	32.84310	57.44144	.53841	106.68686	.000
T4	15.25652	30.90311	15.25652	.50661	30.11503	.000
T6	27.11012	65.44988	27.11012	1.07295	25.26692	.000
T8	9.15244	32.02585	9.15244	.52501	17.43277	.000
T10	11.85353	34.04976	11.85353	.55819	21.23555	.000
T12	19.33049	43.65417	19.33049	.71564	27.01140	.000
T14	1.65184	23.71559	1.65184	.38878	4.24878	.044
T16	30.39723	32.60813	30.39723	.53456	56.86407	.000
T18	.25047	28.23454	.25047	.46286	.54113	.465
T20	.22735	31.18230	.22735	.51119	.44475	.507
T22	.12460	28.96723	.12460	.47487	.26240	.610
T24	9.29167	25.50547	9.29167	.41812	22.22237	.000
T26	1.28049	24.18497	1.28049	.39647	3.22969	.077
T28	7.21471	41.76260	7.21471	.68463	10.53806	.002
T30	19.59499	39.44815	19.59499	.64669	30.30039	.000
T32	49.85605	34.32378	49.85605	.56268	88.60386	.000
T34	.00127	20.54304	.00127	.33677	.00378	.951
T36	.00529	27.44273	.00529	.44988	.01177	.914
T38	.16036	28.25793	.16036	.46324	.34618	.558
T40	58.74792	31.76928	58.74792	.52081	112.80150	.000
T42	50.24326	35.31307	50.24326	.57890	86.79050	.000
T44	40.78902	69.74612	40.78902	1.14338	35.67410	.000
T46	53.62280	37.95078	53.62280	.62214	86.19035	.000
T48	47.05626	31.86900	47.05626	.52244	90.06973	.000
T50	.21936	22.94198	.21936	.37610	.58324	.448
T52	20.47916	40.50938	20.47916	.66409	30.83801	.000
T54	51.07725	29.78851	51.07725	.48834	104.59444	.000
T56	37.17209	30.66732	37.17209	.50274	73.93856	.000
T58	31.83038	31.92458	31.83038	.52335	60.82001	.000
T60	37.78196	22.91704	37.78196	.37569	100.56708	.000
T62	48.46956	33.38609	48.46956	.54731	88.55913	.000
T64	1.01099	16.06306	1.01099	.26333	3.83928	.055

Americans on Ottawa -- Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 14)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.87556	6.59632	32.00	30.00	.000
Hotellings	7.03608	6.59632	32.00	30.00	.000
Wilks	.12444	6.59632	32.00	30.00	.000
Roys	.87556				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,61) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	71.65546	41.90468	71.65546	.68696	104.30776	.000
T4	30.55402	40.40687	30.55402	.66241	46.12570	.000
T6	36.63668	66.26492	36.63668	1.08631	33.72580	.000
T8	6.04576	46.49074	6.04576	.76214	7.93258	.007
T10	13.38921	52.64878	13.38921	.86309	15.51302	.000
T12	11.91296	44.19276	11.91296	.72447	16.44366	.000
T14	.00039	31.73917	.00039	.52031	.00075	.978
T16	51.49433	50.31132	51.49433	.82478	62.43435	.000
T18	.73398	29.69619	.73398	.48682	1.50770	.224
T20	.27091	41.98438	.27091	.68827	.39362	.533
T22	2.44085	45.61579	2.44085	.74780	3.26404	.076
T24	19.83712	31.05296	19.83712	.50906	38.96776	.000
T26	6.62386	30.70922	6.62386	.50343	13.15746	.001
T28	10.33165	58.55831	10.33165	.95997	10.76244	.002
T30	31.73311	48.01550	31.73311	.78714	40.31448	.000
T32	92.63697	46.05042	92.63697	.75492	122.71018	.000
T34	.29420	28.11566	.29420	.46091	.63830	.427
T36	.03455	27.23516	.03455	.44648	.07739	.782
T38	.31461	33.04699	.31461	.54175	.58073	.449
T40	75.08312	41.53883	75.08312	.68096	110.25998	.000
T42	81.85396	37.68671	81.85396	.61781	132.48946	.000
T44	41.01405	67.96520	41.01405	1.11418	36.81086	.000
T46	62.12793	39.94279	62.12793	.65480	94.88079	.000
T48	82.35347	40.61781	82.35347	.66587	123.67879	.000
T50	6.62900	30.53436	6.62900	.50056	13.24308	.001
T52	39.96832	45.49637	39.96832	.74584	53.58818	.000
T54	62.42561	39.85324	62.42561	.65333	95.54964	.000
T56	62.66950	41.21027	62.66950	.67558	92.76424	.000
T58	60.70578	41.89909	60.70578	.68687	88.38025	.000
T60	66.10532	49.64908	66.10532	.81392	81.21851	.000
T62	61.97939	39.96505	61.97939	.65516	94.60122	.000
T64	2.22039	22.59905	2.22039	.37048	5.99334	.017

Americans on CTT - Boston

C) CANADIANS

100 cases accepted.

0 cases rejected because of out-of-range factor values.

1 non-empty cell.

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

AVERAGED Multivariate Tests of Significance (S = 4, M = 13 1/2, N = 115 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	1.93303	6.89709	128.00	944.00	.000
Hotellings	5.27130	9.53365	128.00	926.00	.000
Wilks	.05220	7.99251	128.00	929.56	.000
Roys	.76812				

EFFECT .. REGION (Cont.)

Univariate F-tests with (4,264) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
ACCRD	29.86866	155.73134	7.46716	.58989	12.65854	.000
ASSESSG	20.67463	113.72537	5.16866	.43078	11.99843	.000
ASSESSI	23.92836	340.87164	5.98209	1.29118	4.63304	.001
CLIMATE	174.94328	113.85672	43.73582	.43128	101.41041	.000
COSTLIV	95.71343	169.48657	23.92836	.64199	37.27190	.000
CRIMELV	148.59701	176.20299	37.14925	.66744	55.65969	.000
ENGUTIL	18.16716	113.03284	4.54179	.42815	10.60783	.000
EXPMGR	25.42090	158.57910	6.35522	.60068	10.58008	.000
GOVATT	23.37313	149.02687	5.84328	.56450	10.35133	.000
GOVINC	6.05970	147.14030	1.51493	.55735	2.71809	.030
HARDWRK	4.26866	114.13134	1.06716	.43232	2.46848	.045
HOUSFAC	22.56716	119.83284	5.64179	.45391	12.42925	.000
INFRAST	5.00299	116.19701	1.25075	.44014	2.84170	.025
LABCOST	72.34030	178.45970	18.08507	.67598	26.75371	.000
LABSKIL	19.36119	157.43881	4.84030	.59636	8.11642	.000
LEADCO	59.42090	142.57910	14.85522	.54007	27.50599	.000
LOCREGU	3.29552	97.10448	.82388	.36782	2.23990	.065
LOCTAX	18.54925	113.85075	4.63731	.43125	10.75312	.000
NATTAX	12.16716	129.83284	3.04179	.49179	6.18513	.000
PCOMPS	49.62985	208.77015	12.40746	.79080	15.68984	.000
PCUST	54.59701	262.60299	13.64925	.99471	13.72187	.000
POTHROP	68.69851	408.10149	17.17463	1.54584	11.11023	.000
PSUPP	60.14925	173.85075	15.03731	.65853	22.83482	.000
PURBAN	86.82388	163.97612	21.70597	.62112	34.94641	.000
QUALLIF	32.54925	119.05075	8.13731	.45095	18.04483	.000
SITES	14.37612	152.82388	3.59403	.57888	6.20861	.000
SIZEMKT	83.89851	208.90149	20.97463	.79129	26.50676	.000
TECHADV	37.89851	135.30149	9.47463	.51251	18.48687	.000
TECHSRV	14.01194	144.78806	3.50299	.54844	6.38718	.000
UNIVRC	39.98806	126.01194	9.99701	.47732	20.94414	.000
VENTCAP	59.74925	187.45075	14.93731	.71004	21.03726	.000
USREGU	1.57015	110.02985	.39254	.41678	.94183	.440

Canadians view of the five regions

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 21 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.85747	8.45986	32.00	45.00	.000
Hotellings	6.01590	8.45986	32.00	45.00	.000
Wilks	.14253	8.45986	32.00	45.00	.000
Roys	.85747				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,76) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	26.59740	38.40260	26.59740	.50530	52.63713	.000
T4	13.74026	17.25974	13.74026	.22710	60.50263	.000
T6	12.57143	63.42857	12.57143	.83459	15.06306	.000
T8	21.09740	26.40260	21.09740	.34740	60.72897	.000
T10	58.60390	59.89610	58.60390	.78811	74.36036	.000
T12	12.00649	45.49351	12.00649	.59860	20.05766	.000
T14	6.24026	49.25974	6.24026	.64815	9.62774	.003
T16	8.41558	47.58442	8.41558	.62611	13.44105	.000
T18	1.46104	23.03896	1.46104	.30314	4.81962	.031
T20	7.95455	29.54545	7.95455	.38876	20.46154	.000
T22	.78571	27.71429	.78571	.36466	2.15464	.146
T24	.05844	35.44156	.05844	.46634	.12532	.724
T26	1.66234	26.33766	1.66234	.34655	4.79684	.032
T28	45.81818	65.18182	45.81818	.85766	53.42259	.000
T30	15.59091	46.90909	15.59091	.61722	25.25969	.000
T32	44.73377	38.76623	44.73377	.51008	87.69916	.000
T34	.93506	25.06494	.93506	.32980	2.83523	.096
T36	3.43506	31.06494	3.43506	.40875	8.40385	.005
T38	1.87662	17.62338	1.87662	.23189	8.09285	.006
T40	36.52597	60.97403	36.52597	.80229	45.52716	.000
T42	22.60390	70.89610	22.60390	.93284	24.23118	.000
T44	.05844	85.44156	.05844	1.12423	.05198	.820
T46	41.55844	39.44156	41.55844	.51897	80.07903	.000
T48	49.14935	37.35065	49.14935	.49146	100.00765	.000
T50	2.86364	29.63636	2.86364	.38995	7.34356	.008
T52	2.34416	46.15584	2.34416	.60731	3.85988	.053
T54	38.50000	45.00000	38.50000	.59211	65.02222	.000
T56	32.73377	28.76623	32.73377	.37850	86.48217	.000
T58	7.95455	40.54545	7.95455	.53349	14.91031	.000
T60	19.64286	28.85714	19.64286	.37970	51.73267	.000
T62	18.24026	34.25974	18.24026	.45079	40.46323	.000
T64	.16234	9.33766	.16234	.12286	1.32128	.254

Canadians on Palo Alto -- Raleigh

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 23)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.88115	11.12097	32.00	48.00	.000
Hotellings	7.41398	11.12097	32.00	48.00	.000
Wilks	.11885	11.12097	32.00	48.00	.000
Roys	.88115				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,79) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	18.90625	38.59375	18.90625	.48853	38.70040	.000
T4	7.22500	39.77500	7.22500	.50348	14.35009	.000
T6	.10000	112.90000	.10000	1.42911	.06997	.792
T8	160.00000	55.00000	160.00000	.69620	229.81818	.000
T10	57.60000	65.40000	57.60000	.82785	69.57798	.000
T12	107.25625	72.24375	107.25625	.91448	117.28688	.000
T14	16.25625	42.24375	16.25625	.53473	30.40080	.000
T16	4.90000	66.10000	4.90000	.83671	5.85628	.018
T18	14.40000	62.60000	14.40000	.79241	18.17252	.000
T20	2.25625	60.24375	2.25625	.76258	2.95871	.089
T22	.30625	50.19375	.30625	.63536	.48201	.490
T24	18.22500	41.77500	18.22500	.52880	34.46499	.000
T26	1.60000	39.40000	1.60000	.49873	3.20812	.077
T28	51.75625	76.74375	51.75625	.97144	53.27787	.000
T30	5.62500	52.37500	5.62500	.66297	8.48449	.005
T32	11.55625	36.94375	11.55625	.46764	24.71172	.000
T34	.50625	39.99375	.50625	.50625	1.00000	.320
T36	7.22500	43.77500	7.22500	.55411	13.03883	.001
T38	5.62500	61.37500	5.62500	.77690	7.24033	.009
T40	19.60000	74.40000	19.60000	.94177	20.81183	.000
T42	21.75625	98.74375	21.75625	1.24992	17.40610	.000
T44	31.50625	151.99375	31.50625	1.92397	16.37563	.000
T46	44.10000	52.90000	44.10000	.66962	65.85822	.000
T48	43.05625	45.44375	43.05625	.57524	74.84954	.000
T50	21.75625	42.74375	21.75625	.54106	40.21041	.000
T52	2.25625	49.24375	2.25625	.62334	3.61962	.061
T54	41.00625	92.49375	41.00625	1.17081	35.02392	.000
T56	21.75625	39.74375	21.75625	.50309	43.24564	.000
T58	4.55625	39.94375	4.55625	.50562	9.01127	.004
T60	28.05625	46.44375	28.05625	.58790	47.72319	.000
T62	42.02500	85.97500	42.02500	1.08829	38.61559	.000
T64	.50625	42.99375	.50625	.54422	.93022	.338

Canadians on Palo Alto -- Ottawa

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 23 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.89144	12.57434	32.00	49.00	.000
Hotellings	8.21181	12.57434	32.00	49.00	.000
Wilks	.10856	12.57434	32.00	49.00	.000
Rois	.89144				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,80) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	24.50000	48.00000	24.50000	.60000	40.83333	.000
T4	20.05556	46.44444	20.05556	.58056	34.54545	.000
T6	4.17284	125.82716	4.17284	1.57284	2.65306	.107
T8	94.91358	53.08642	94.91358	.66358	143.03256	.000
T10	77.43210	60.56790	77.43210	.75710	102.27477	.000
T12	80.22222	66.77778	80.22222	.83472	96.10649	.000
T14	13.06173	49.93827	13.06173	.62423	20.92460	.000
T16	20.76543	45.23457	20.76543	.56543	36.72489	.000
T18	14.82099	52.67901	14.82099	.65849	22.50762	.000
T20	.61728	48.38272	.61728	.60478	1.02067	.315
T22	.15432	42.34568	.15432	.52932	.29155	.591
T24	7.13580	58.86420	7.13580	.73580	9.69799	.003
T26	6.32099	46.67901	6.32099	.58349	10.83311	.001
T28	53.38889	63.11111	53.38889	.78889	67.67606	.000
T30	18.00000	38.00000	18.00000	.47500	37.89474	.000
T32	47.80247	53.19753	47.80247	.66497	71.88675	.000
T34	.50000	31.00000	.50000	.38750	1.29032	.259
T36	2.72222	36.77778	2.72222	.45972	5.92145	.017
T38	4.17284	57.82716	4.17284	.72284	5.77284	.019
T40	32.00000	76.00000	32.00000	.95000	33.68421	.000
T42	20.76543	108.23457	20.76543	1.35293	15.34847	.000
T44	26.08025	169.41975	26.08025	2.11775	12.31509	.001
T46	32.00000	77.00000	32.00000	.96250	33.24675	.000
T48	16.69136	55.30864	16.69136	.69136	24.14286	.000
T50	12.50000	48.00000	12.50000	.60000	20.83333	.000
T52	13.06173	49.93827	13.06173	.62423	20.92460	.000
T54	55.70988	92.79012	55.70988	1.15988	48.03087	.000
T56	23.72840	43.27160	23.72840	.54090	43.86876	.000
T58	16.05556	38.44444	16.05556	.48056	33.41040	.000
T60	1.20988	33.79012	1.20988	.42238	2.86445	.094
T62	48.89506	79.60494	48.89506	.99506	49.13772	.000
T64	.50000	41.00000	.50000	.51250	.97561	.326

Canadians on Palo Alto -- CTT

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 21 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.85970	8.61715	32.00	45.00	.000
Hotellings	6.12775	8.61715	32.00	45.00	.000
Wilks	.14030	8.61715	32.00	45.00	.000
Rois	.85970				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,76) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	6.24026	25.25974	6.24026	.33237	18.77532	.000
T4	12.57143	20.42857	12.57143	.26880	46.76923	.000
T6	5.84416	68.15584	5.84416	.89679	6.51677	.013
T8	85.87662	36.62338	85.87662	.48189	178.20922	.000
T10	14.34416	40.15584	14.34416	.52837	27.14812	.000
T12	.23377	32.76623	.23377	.43113	.54221	.464
T14	.64935	25.35065	.64935	.33356	1.94672	.167
T16	1.46104	27.03896	1.46104	.35578	4.10663	.046
T18	8.88961	38.61039	8.88961	.50803	17.49815	.000
T20	1.87662	21.62338	1.87662	.28452	6.59580	.012
T22	.78571	30.71429	.78571	.40414	1.94419	.167
T24	.93506	45.06494	.93506	.59296	1.57695	.213
T26	2.59740	27.40260	2.59740	.36056	7.20379	.009
T28	11.45455	25.54545	11.45455	.33612	34.07829	.000
T30	6.24026	41.25974	6.24026	.54289	11.49449	.001
T32	6.64935	25.35065	6.64935	.33356	19.93443	.000
T34	.00649	23.49351	.00649	.30913	.02101	.885
T36	.02597	21.97403	.02597	.28913	.08983	.765
T38	.05844	21.44156	.05844	.28213	.20715	.650
T40	4.73377	49.76623	4.73377	.65482	7.22912	.009
T42	.16234	52.33766	.16234	.68865	.23573	.629
T44	5.46104	106.03896	5.46104	1.39525	3.91402	.052
T46	8.88961	49.61039	8.88961	.65277	13.61832	.000
T48	.02597	24.97403	.02597	.32861	.07904	.779
T50	.10390	27.89610	.10390	.36705	.28305	.596
T52	.78571	44.71429	.78571	.58835	1.33546	.251
T54	1.87662	43.62338	1.87662	.57399	3.26943	.075
T56	7.07143	22.42857	7.07143	.29511	23.96178	.000
T58	5.09091	35.90909	5.09091	.47249	10.77468	.002
T60	.10390	28.89610	.10390	.38021	.27326	.603
T62	8.41558	28.58442	8.41558	.37611	22.37528	.000
T64	.02597	12.97403	.02597	.17071	.15215	.698

Canadians on Palo Alto -- Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 20 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.85654	8.02322	32.00	43.00	.000
Hotellings	5.97077	8.02322	32.00	43.00	.000
Wilks	.14346	8.02322	32.00	43.00	.000
Rois	.85654				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,74) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	.66667	41.33333	.66667	.55856	1.19355	.278
T4	.54000	37.96000	.54000	.51297	1.05269	.308
T6	14.72667	97.77333	14.72667	1.32126	11.14592	.001
T8	65.34000	44.16000	65.34000	.59676	109.49185	.000
T10	.00667	47.49333	.00667	.64180	.01039	.919
T12	40.56000	50.44000	40.56000	.68162	59.50515	.000
T14	1.30667	31.69333	1.30667	.42829	3.05090	.085
T16	.16667	47.33333	.16667	.63964	.26056	.611
T18	6.40667	55.09333	6.40667	.74450	8.60528	.004
T20	.66667	56.33333	.66667	.76126	.87574	.352
T22	1.12667	35.37333	1.12667	.47802	2.35695	.129
T24	18.02667	27.97333	18.02667	.37802	47.68732	.000
T26	.10667	28.89333	.10667	.39045	.27319	.603
T28	.02667	63.97333	.02667	.86450	.03085	.861
T30	1.70667	30.29333	1.70667	.40937	4.16901	.045
T32	11.20667	44.29333	11.20667	.59856	18.72276	.000
T34	2.16000	37.84000	2.16000	.51135	4.22410	.043
T36	19.44000	48.56000	19.44000	.65622	29.62438	.000
T38	12.32667	52.17333	12.32667	.70505	17.48352	.000
T40	2.94000	57.56000	2.94000	.77784	3.77971	.056
T42	.02667	78.97333	.02667	1.06721	.02499	.875
T44	40.56000	114.44000	40.56000	1.54649	26.22719	.000
T46	.32667	51.17333	.32667	.69153	.47238	.494
T48	.66667	41.33333	.66667	.55856	1.19355	.278
T50	7.26000	39.24000	7.26000	.53027	13.69113	.000
T52	.16667	52.33333	.16667	.70721	.23567	.629
T54	.00000	64.00000	.00000	.86486	.00000	1.000
T56	1.12667	38.37333	1.12667	.51856	2.17269	.145
T58	.32667	32.17333	.32667	.43477	.75135	.389
T60	.42667	47.57333	.42667	.64288	.66368	.418
T62	4.16667	61.33333	4.16667	.82883	5.02717	.028
T64	.80667	45.69333	.80667	.61748	1.30639	.257

Canadians on Raleigh -- Ottawa

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 21)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.81116	5.90625	32.00	44.00	.000
Hotellings	4.29546	5.90625	32.00	44.00	.000
Wilks	.18884	5.90625	32.00	44.00	.000
Roys	.81116				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,75) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	.00658	68.49342	.00658	.91325	.00720	.933
T4	.65789	41.34211	.65789	.55123	1.19351	.278
T6	4.11184	97.38816	4.11184	1.29851	3.16659	.079
T8	27.79605	40.70395	27.79605	.54272	51.21626	.000
T10	.53289	45.96711	.53289	.61289	.86947	.354
T12	26.94737	52.05263	26.94737	.69404	38.82710	.000
T14	.42105	30.57895	.42105	.40772	1.03270	.313
T16	2.63158	49.36842	2.63158	.65825	3.99787	.049
T18	8.05921	39.44079	8.05921	.52588	15.32527	.000
T20	2.13158	52.86842	2.13158	.70491	3.02389	.086
T22	1.90132	33.59868	1.90132	.44798	4.24417	.043
T24	7.16447	37.33553	7.16447	.49781	14.39207	.000
T26	1.48026	40.01974	1.48026	.53360	2.77412	.100
T28	.16447	43.33553	.16447	.57781	.28465	.595
T30	.05921	44.44079	.05921	.59254	.09993	.753
T32	.32237	56.17763	.32237	.74904	.43038	.514
T34	2.37500	32.12500	2.37500	.42833	5.54475	.021
T36	11.05921	39.44079	11.05921	.52588	21.03003	.000
T38	10.52632	49.47368	10.52632	.65965	15.95745	.000
T40	.16447	55.33553	.16447	.73781	.22292	.638
T42	.23684	76.76316	.23684	1.02351	.23140	.632
T44	20.63158	128.36842	20.63158	1.71158	12.05412	.001
T46	.05921	58.44079	.05921	.77921	.07599	.784
T48	10.00658	68.49342	10.00658	.91325	10.95716	.001
T50	2.63158	32.36842	2.63158	.43158	6.09756	.016
T52	5.92105	57.07895	5.92105	.76105	7.78008	.007
T54	2.13158	56.86842	2.13158	.75825	2.81120	.098
T56	.42105	49.57895	.42105	.66105	.63694	.427
T58	1.11184	50.38816	1.11184	.67184	1.65492	.202
T60	9.50000	43.50000	9.50000	.58000	16.37931	.000
T62	5.92105	41.07895	5.92105	.54772	10.81038	.002
T64	.94737	47.05263	.94737	.62737	1.51007	.223

Canadians on Raleigh -- CTT

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 20)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.81712	5.86416	32.00	42.00	.000
Hotellings	4.46793	5.86416	32.00	42.00	.000
Wilks	.18288	5.86416	32.00	42.00	.000
Roys	.81712				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,73) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	6.08108	47.91892	6.08108	.65642	9.26396	.003
T4	.00676	30.49324	.00676	.41772	.01618	.899
T6	.81757	81.68243	.81757	1.11894	.73066	.395
T8	19.70270	31.29730	19.70270	.42873	45.95596	.000
T10	18.27027	41.72973	18.27027	.57164	31.96114	.000
T12	13.08108	39.91892	13.08108	.54683	23.92146	.000
T14	2.97973	24.52027	2.97973	.33589	8.87104	.004
T16	4.22297	45.27703	4.22297	.62023	6.80869	.011
T18	5.68243	26.81757	5.68243	.36736	15.46813	.000
T20	2.18919	25.81081	2.18919	.35357	6.19162	.015
T22	.02703	26.97297	.02703	.36949	.07315	.788
T24	.97297	25.02703	.97297	.34284	2.83801	.096
T26	.24324	27.75676	.24324	.38023	.63973	.426
T28	12.49324	39.00676	12.49324	.53434	23.38074	.000
T30	1.72973	51.27027	1.72973	.70233	2.46284	.121
T32	14.29730	44.70270	14.29730	.61237	23.34764	.000
T34	1.32432	21.67568	1.32432	.29693	4.46010	.038
T36	4.56757	26.43243	4.56757	.36209	12.61452	.001
T38	3.57432	20.92568	3.57432	.28665	12.46916	.001
T40	12.49324	58.00676	12.49324	.79461	15.72242	.000
T42	19.70270	44.29730	19.70270	.60681	32.46919	.000
T44	4.22297	70.27703	4.22297	.96270	4.38660	.040
T46	6.08108	48.91892	6.08108	.67012	9.07459	.004
T48	51.14189	38.35811	51.14189	.52545	97.32905	.000
T50	5.29730	25.70270	5.29730	.35209	15.04522	.000
T52	.00000	36.00000	.00000	.49315	.00000	1.000
T54	19.70270	40.29730	19.70270	.55202	35.69215	.000
T56	11.35811	30.14189	11.35811	.41290	27.50796	.000
T58	.54730	45.95270	.54730	.62949	.86943	.354
T60	16.89189	35.10811	16.89189	.48093	35.12317	.000
T62	2.70270	38.29730	2.70270	.52462	5.15173	.026
T64	.24324	9.75676	.24324	.13365	1.81994	.181

Canadians on Raleigh -- Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 23 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.74744	4.53176	32.00	49.00	.000
Hotellings	2.95952	4.53176	32.00	49.00	.000
Wilks	.25256	4.53176	32.00	49.00	.000
Roys	.74744				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,80) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	1.04321	51.45679	1.04321	.64321	1.62188	.207
T4	3.26543	34.23457	3.26543	.42793	7.63072	.007
T6	6.72222	113.77778	6.72222	1.42222	4.72656	.033
T8	6.72222	16.77778	6.72222	.20972	32.05298	.000
T10	1.38889	28.11111	1.38889	.35139	3.95257	.050
T12	1.78395	33.71605	1.78395	.42145	4.23288	.043
T14	.22222	13.77778	.22222	.17222	1.29032	.259
T16	5.19136	28.30864	5.19136	.35386	14.67074	.000
T18	.02469	31.97531	.02469	.39969	.06178	.804
T20	.02469	21.97531	.02469	.27469	.08989	.765
T22	.00617	21.49383	.00617	.26867	.02298	.880
T24	2.22840	18.27160	2.22840	.22840	9.75676	.002
T26	1.38889	32.11111	1.38889	.40139	3.46021	.067
T28	.02469	31.97531	.02469	.39969	.06178	.804
T30	3.55556	32.44444	3.55556	.40556	8.76712	.004
T32	14.82099	36.67901	14.82099	.45849	32.32582	.000
T34	.02469	10.97531	.02469	.13719	.17998	.673
T36	.88889	19.11111	.88889	.23889	3.72093	.057
T38	.09877	7.90123	.09877	.09877	1.00000	.320
T40	3.26543	61.23457	3.26543	.76543	4.26613	.042
T42	.30247	50.19753	.30247	.62747	.48205	.490
T44	2.72222	156.77778	2.72222	1.95972	1.38909	.242
T46	.30247	57.19753	.30247	.71497	.42305	.517
T48	6.32099	52.67901	6.32099	.65849	9.59925	.003
T50	1.38889	25.11111	1.38889	.31389	4.42478	.039
T52	5.19136	27.30864	5.19136	.34136	15.20796	.000
T54	2.98765	42.01235	2.98765	.52515	5.68910	.019
T56	.39506	42.60494	.39506	.53256	.74181	.392
T58	2.98765	37.01235	2.98765	.46265	6.45764	.013
T60	11.41358	38.08642	11.41358	.47608	23.97407	.000
T62	.39506	33.60494	.39506	.42006	.94048	.335
T64	.02469	5.97531	.02469	.07469	.33058	.567

Canadians on Ottawa -- CTT

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 21)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.84361	7.41713	32.00	44.00	.000
Hotellings	5.39427	7.41713	32.00	44.00	.000
Wilks	.15639	7.41713	32.00	44.00	.000
Roys	.84361				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,75) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	3.18421	33.81579	3.18421	.45088	7.06226	.010
T4	.42105	32.57895	.42105	.43439	.96931	.328
T6	5.92105	90.07895	5.92105	1.20105	4.92989	.029
T8	11.05921	23.44079	11.05921	.31254	35.38451	.000
T10	16.44737	53.55263	16.44737	.71404	23.03440	.000
T12	91.60526	55.39474	91.60526	.73860	124.02613	.000
T14	8.05921	27.44079	8.05921	.36588	22.02709	.000
T16	1.28947	47.71053	1.28947	.63614	2.02703	.159
T18	.32237	53.17763	.32237	.70904	.45466	.502
T20	.23684	51.76316	.23684	.69018	.34316	.560
T22	1.68421	35.31579	1.68421	.47088	3.57675	.062
T24	8.52632	22.47368	8.52632	.29965	28.45433	.000
T26	.10526	30.89474	.10526	.41193	.25554	.615
T28	17.11184	57.38816	17.11184	.76518	22.36329	.000
T30	.05921	44.44079	.05921	.59254	.09993	.753
T32	.53289	31.96711	.53289	.42623	1.25026	.267
T34	.16447	24.33553	.16447	.32447	.50689	.479
T36	3.78947	25.21053	3.78947	.33614	11.27349	.001
T38	2.90132	39.59868	2.90132	.52798	5.49510	.022
T40	5.53289	53.96711	5.53289	.71956	7.68926	.007
T42	23.68421	80.31579	23.68421	1.07088	22.11664	.000
T44	13.32237	85.17763	13.32237	1.13570	11.73052	.001
T46	12.16447	42.33553	12.16447	.56447	21.55012	.000
T48	42.10526	53.89474	42.10526	.71860	58.59375	.000
T50	22.90132	36.59868	22.90132	.48798	46.93061	.000
T52	.10526	41.89474	.10526	.55860	.18844	.665
T54	26.11184	76.38816	26.11184	1.01851	25.63733	.000
T56	3.78947	39.21053	3.78947	.52281	7.24832	.009
T58	.00000	41.00000	.00000	.54667	.00000	1.000
T60	22.90132	42.59868	22.90132	.56798	40.32046	.000
T62	14.53289	73.96711	14.53289	.98623	14.73584	.000
T64	.32237	41.17763	.32237	.54904	.58715	.446

Canadians on Ottawa -- Boston

Tests involving 'REGION' Within-Subject Effect.

EFFECT .. REGION

Multivariate Tests of Significance (S = 1, M = 15 , N = 22 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.74812	4.36249	32.00	47.00	.000
Hotellings	2.97021	4.36249	32.00	47.00	.000
Wilks	.25188	4.36249	32.00	47.00	.000
Roys	.74812				

Note.. F statistics are exact.

EFFECT .. REGION (Cont.)

Univariate F-tests with (1,78) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
T2	5.69620	39.30380	5.69620	.50389	11.30435	.001
T4	.91139	38.08861	.91139	.48832	1.86640	.176
T6	.63291	106.36709	.63291	1.36368	.46412	.498
T8	.22785	16.77215	.22785	.21503	1.05962	.306
T10	23.55063	50.94937	23.55063	.65320	36.05441	.000
T12	72.46203	58.03797	72.46203	.74408	97.38517	.000
T14	5.32278	32.17722	5.32278	.41253	12.90283	.001
T16	11.70253	42.79747	11.70253	.54869	21.32831	.000
T18	.63291	30.36709	.63291	.38932	1.62568	.206
T20	.10127	38.89873	.10127	.49870	.20306	.654
T22	1.82911	27.67089	1.82911	.35475	5.15599	.026
T24	2.53165	34.46835	2.53165	.44190	5.72898	.019
T26	.76582	26.73418	.76582	.34275	2.23438	.139
T28	15.82278	48.17722	15.82278	.61766	25.61745	.000
T30	3.06329	51.93671	3.06329	.66586	4.60054	.035
T32	18.45570	43.54430	18.45570	.55826	33.05930	.000
T34	.31013	23.18987	.31013	.29731	1.04312	.310
T36	1.42405	27.07595	1.42405	.34713	4.10238	.046
T38	1.82911	35.67089	1.82911	.45732	3.99965	.049
T40	14.58228	63.41772	14.58228	.81305	17.93533	.000
T42	27.56962	98.43038	27.56962	1.26193	21.84722	.000
T44	4.96203	135.03797	4.96203	1.73126	2.86614	.094
T46	10.12658	52.87342	10.12658	.67786	14.93895	.000
T48	16.46203	61.03797	16.46203	.78254	21.03671	.000
T50	14.58228	29.41772	14.58228	.37715	38.66437	.000
T52	6.08228	34.41772	6.08228	.44125	13.78411	.000
T54	43.60127	72.89873	43.60127	.93460	46.65237	.000
T56	5.32278	38.17722	5.32278	.48945	10.87500	.001
T58	3.64557	35.35443	3.64557	.45326	8.04296	.006
T60	1.06962	22.43038	1.06962	.28757	3.71953	.057
T62	23.55063	59.94937	23.55063	.76858	30.64168	.000
T64	.31013	45.18987	.31013	.57936	.53529	.467

Canadians on Boston -- CTT

Appendix L - Performance Mapping

Legend:

Factor 1: Government/Regulation

- 1 availability of government incentives
- 2 national regulatory practices
- 3 govt attitude to business & investment
- 4 regional regulatory practices
- 5 local tax structure for business
- 6 provincial/national tax structure

Factor 3: Technology Infrastructure

- 12 access to R&D facilities
- 13 presence of leading companies or entrepreneurs
- 14 availability of suitable sites
- 15 overall level of technological advancement
- 16 presence of universities
- 17 availability of venture capital

Factor 5: General Infrastructure

- 21 energy and related utility costs
- 22 overall physical infrastructure
- 23 proximity to suppliers

Factor 7: Centrality

- 26 proximity to complementary/competing companies
- 27 proximity to large urban centres

Factor 9: Other

- 30 proximity to other existing operations

Factor 2: Quality of life

- 7 physical climate
- 8 cost of living
- 9 crime level
- 10 housing, schooling facilities
- 11 overall quality of life

Factor 4: Skills

- 18 local availability of expert managers
- 19 local availability of labour skills
- 20 local availability of technical services

Factor 6: Market

- 24 proximity to customers & markets
- 25 size and potential of local market

Factor 8: Labour

- 28 industriousness of workforce:
- 29 labour costs

Appendix L - Performance Mapping (cont'd)

Legend:

Factor 1: Government/Regulation

- 1 availability of government incentives
- 2 national regulatory practices
- 3 govt attitude to business & investment
- 4 regional regulatory practices
- 5 local tax structure for business
- 6 provincial/national tax structure

Factor 3: Technology Infrastructure

- 12 access to R&D facilities
- 13 presence of leading companies/entrepreneurs
- 14 availability of suitable sites
- 15 overall level of technological advancement
- 16 presence of universities
- 17 availability of venture capital

Factor 5: General Infrastructure

- 21 energy and related utility costs
- 22 overall physical infrastructure
- 23 proximity to suppliers

Factor 7: Centrality

- 26 proximity to complementary/competing companies
- 27 proximity to large urban centres

Factor 9: Other

- 30 proximity to other existing operations

Factor 2: Quality of life

- 7 physical climate
- 8 cost of living
- 9 crime level
- 10 housing, schooling facilities
- 11 overall quality of life

Factor 4: Skills

- 18 local availability of expert managers
- 19 local availability of labour skills
- 20 local availability of technical services

Factor 6: Market

- 24 proximity to customers & markets
- 25 size and potential of local market

Factor 8: Labour

- 28 industriousness of workforce
- 29 labour costs

Appendix L - Performance Mapping (cont'd)

Legend:

Factor 1: Government/Regulation

- 1 availability of government incentives
- 2 national regulatory practices
- 3 govt attitude to business & investment
- 4 regional regulatory practices
- 5 local tax structure for business
- 6 provincial/national tax structure

Factor 3: Technology Infrastructure

- 12 access to R&D facilities
- 13 presence of leading companies/ entrepreneurs
- 14 availability of suitable sites
- 15 overall level of technological advancement
- 16 presence of universities
- 17 availability of venture capital

Factor 5: General Infrastructure

- 21 energy and related utility costs
- 22 overall physical infrastructure
- 23 proximity to suppliers

Factor 7: Centrality

- 26 proximity to complementary/competing companies
- 27 proximity to large urban centres

Factor 9: Other

- 30 proximity to other existing operations

Factor 2: Quality of life

- 7 physical climate
- 8 cost of living
- 9 crime level
- 10 housing, schooling facilities
- 11 overall quality of life

Factor 4: Skills

- 18 local availability of expert managers
- 19 local availability of labour skills
- 20 local availability of technical services

Factor 6: Market

- 24 proximity to customers & markets
- 25 size and potential of local market

Factor 8: Labour

- 28 industriousness of workforce:
- 29 labour costs

Appendix L - Performance Mapping (cont'd)

Legend:

Factor 1: Government/Regulation

- 1 availability of government incentives
- 2 national regulatory practices
- 3 govt attitude to business & investment
- 4 regional regulatory practices
- 5 local tax structure for business
- 6 provincial/national tax structure

Factor 3: Technology Infrastructure

- 12 access to R&D facilities
- 13 presence of leading companies or entrepreneurs
- 14 availability of suitable sites
- 15 overall level of technological advancement
- 16 presence of universities
- 17 availability of venture capital

Factor 5: General Infrastructure

- 21 energy and related utility costs
- 22 overall physical infrastructure
- 23 proximity to suppliers

Factor 7: Centrality

- 26 proximity to complementary/competing companies
- 27 proximity to large urban centres

Factor 9: Other

- 30 proximity to other existing operations

Factor 2: Quality of life

- 7 physical climate
- 8 cost of living
- 9 crime level
- 10 housing, schooling facilities
- 11 overall quality of life

Factor 4: Skills

- 18 local availability of expert managers
- 19 local availability of labour skills
- 20 local availability of technical services

Factor 6: Market

- 24 proximity to customers & markets
- 25 size and potential of local market

Factor 8: Labour

- 28 industriousness of workforce:
- 29 labour costs

Appendix L - Performance Mapping (cont'd)

Legend:

Factor 1: Government/Regulation

- 1 availability of government incentives
- 2 national regulatory practices
- 3 govt attitude to business & investment
- 4 regional regulatory practices
- 5 local tax structure for business
- 6 provincial/national tax structure

Factor 3: Technology Infrastructure

- 12 access to R&D facilities
- 13 presence of leading companies or entrepreneurs
- 14 availability of suitable sites
- 15 overall level of technological advancement
- 16 presence of universities
- 17 availability of venture capital

Factor 5: General Infrastructure

- 21 energy and related utility costs
- 22 overall physical infrastructure
- 23 proximity to suppliers

Factor 7: Centrality

- 26 proximity to complementary/competing companies
- 27 proximity to large urban centres

Factor 9: Other

- 30 proximity to other existing operations

Factor 2: Quality of life

- 7 physical climate
- 8 cost of living
- 9 crime level
- 10 housing, schooling facilities
- 11 overall quality of life

Factor 4: Skills

- 18 local availability of expert managers
- 19 local availability of labour skills
- 20 local availability of technical services

Factor 6: Market

- 24 proximity to customers & markets
- 25 size and potential of local market

Factor 8: Labour

- 28 industriousness of workforce
- 29 labour costs

Appendix M - DISCRIMINANT ANALYSIS

Overall multivariate test indicates the 3 groups are significantly different on the set of variables

Pairwise multivariate tests indicated that groups 1&2, 1&3 and 2&3 are significantly different at the 0.05 level
Group 1 = Ottawa (O), Group 2 = Other Canadians (CDN), Group 3 = US

Univariate t's were obtained. The table below indicates which variables are contributing to each pair

Significant K=3 Group MANOVA	O/CDN	O/US	US/CDN
Access to R&D facilities		O	CDN
Overall assessment of region in general			
Overall assessment as site for investment			
Physical climate		O	
Cost of living	O	O	
Crime level		O	CDN
Energy & related utility costs		O	CDN
Local availability of expert managers		O	CDN
Government attitude to business & investment			CDN
Availability of government incentives for investment			CDN
Industriousness of workforce	O	O	
Housing, schooling & recreational facilities	O	O	
Overall physical infrastructure		O	CDN
Labour costs	O	O	
Local availability of the right labour skills		O	CDN
Presence of leading companies or entrepreneurs	O	O	CDN
Regional regulatory practices			
Local tax structure for business			
Provincial/national tax structure for business			
Proximity to complementary or competing companies	O	O	CDN
Proximity to major customers and markets	O	O	
Proximity to existing operations of our company	O	O	CDN
Proximity to suppliers		O	CDN
Proximity to large urban centres			
Overall quality of life	O	O	CDN
Availability of suitable sites in research parks		O	CDN
Size and potential of local market	O	O	
Overall level of technological advancement		O	CDN
Local availability of technical & professional services		O	CDN
Presence of local universities & industry research centres			
Availability of venture capital		O	CDN
National (Canada/US) regulatory practices			CDN

Appendix N - Discriminant analysis on how different sized companies rate Ottawa
Follow-Up Tests for a Significant K=3 Group MANOVA

F statistics and significances between pairs of groups after step 32
 Each F statistic has 32 and 93 degrees of freedom.

Group	Group	
	1 less 10 million	2 10 million - 50 milli
2 10 million - 50 milli	.8440 .7010	
3 over 50 mill ion	.6360 .9261	.9497 .5514

F level or tolerance or VIN insufficient for further computation.

** The overall level for pairwise T tests were set at 15% (Stevens 1992: p.198), which in this case means that a 5% (Bonferonni) level was used for the three individual pairwise tests. We conclude from above that the three groups do not differ significantly.

Appendix O - Pre-notification Letter

Date:

Name

Title

Company

Province

Dear ,

In a few days you will be contacted about a research project that focuses on a fundamental paradigm shift that has been brought about by globalization and free trade: *cities and regions now compete directly, rather than only through national programs, for business investment in the international arena*. The project is being carried out under the direction of the International Business Study Group* and The IKON Research Group* at Carleton University with the cooperation of KPMG. We are writing in advance to inform you about it and kindly ask for your cooperation.

The study examines how senior business executives such as yourself view various technology-intensive regions in North America as potential locations for investment (anything from a small sales office to manufacturing or other direct local presence). Your personal views are very important and obtaining a representative sample of responses from the technology community is crucial to the success of the study. *The results will be of direct interest to business and to regional policy makers who need to develop strategies that satisfy the location requirements of companies such as yours.*

The project is part of our larger, on-going research program on the images of places, which has included some 30 studies and 10,000 interviews over the past decade. This study is a "global first" in terms of applying knowledge about the images of countries to the regional level in the technology investment context. It will be carried out by Ms. Daniela De Cecco, a graduate student in our Master of Management Studies program, who is working on it as part of her thesis under our supervision.

The questionnaire you will receive is **brief** and we will be glad to provide you with a **summary of our findings**. As this project is related to a theme of current and significant interest, the relative attractiveness of competing technology centres for investment, we hope you will agree to participate.

If you have any questions, please do not hesitate to contact us at the above address or fax/phone numbers or by e-mail at <ibsg@business.carleton.ca>. Thank you very much for your cooperation.

Cordially,

Dr. Nicolas Papadopoulos
Professor of Marketing & International Business
Director, International Business Study Group

Dr. Louise A. Heslop
Professor of Marketing
Associate Dean (R&D),
Faculty of Social Sciences

Appendix O (cont'd) - Letter accompanying Questionnaire

Date:

First/Last name

Title

Company

City & province/state

Dear [last name],

Following up on the letter sent to you a few days ago by Professors Nicolas Papadopoulos and Louise Heslop, of Carleton University's International Business Study Group, I am enclosing the survey questionnaire for our project on the competitive profiles of technology-intensive regions.

The study is about selected key technology regions in North America and how senior business executives such as yourself view them as potential locations for investment (anything from a small sales office to manufacturing or other direct local presence). Your cooperation in completing the survey will be most appreciated -- it is crucial to the success of the study that we obtain a representative sample of responses from knowledgeable executives in the technology community. **If you feel that the questionnaire should be answered by someone else in your company who deals more directly with investment decisions, please do not hesitate to pass it on to him or her.**

As noted in the previous letter, the project focuses on the fundamental paradigm shift that has been brought about by globalization and free trade: *cities and regions now compete directly, rather than only through national programs, for business investment in the international arena*. The results will be of direct interest to business and to regional policy makers who need to develop strategies and policies that satisfy the location requirements of companies such as yours.

The questionnaire is brief and takes only a few minutes to complete. A pre-addressed return envelope is included. **Your replies will be kept strictly confidential and analyzed without identification.** Returned envelopes will be opened by another student of the International Business Study Group and the questionnaires will be forwarded to me separately for computer inputting and analysis.

Please complete the survey -- your help is needed to enable us to produce useful results for business and government, for other researchers, and for me to complete my thesis. I will be glad to provide you with a **summary of the results** if you would like (just check the box on the questionnaire cover).

Knowing the heavy demands on your time, we all appreciate your help in this project very much. If you have any questions or comments, please do not hesitate to contact me or Dr. Papadopoulos at the above address or fax/phone numbers or by e-mail at <ibsg@business.carleton.ca>.

Sincerely,

Daniela De Cecco
Graduate student

Appendix O (cont'd) - Follow-up letter

Date:

First/Last name

Title

Company

City & province/state

Dear [last name],

***** REMINDER *****

Will you please help us complete the study of the competitive profiles of technology-intensive regions? It is of direct interest to business and government, and we will be happy to provide you with a summary on request (just check the box on the questionnaire cover).

About three weeks ago we asked you to participate in a survey of senior executives in American and Canadian technology companies about investing in selected regions in North America carried out under the auspices of Carleton University's International Business Study Group (IBSG).

If you have already completed and returned the questionnaire, please accept our sincere thanks and ignore this reminder notice.

If not, could we kindly ask you to complete and return the questionnaire as soon as possible? Your response is crucial to the success of the study and the completion of my Master's thesis.

The results will be of interest to business and regional policy makers who need to develop strategies to meet the location requirements of firms such as yours.

A second copy and return envelope are enclosed for your convenience.

The questionnaire is very brief and takes only a few minutes to complete. If you feel that it should be answered by someone else in your company who deals more directly with investment decisions, please do not hesitate to pass it on to him or her. Replies will be kept strictly confidential and analysed without identification.

Knowing how busy you are, we appreciate your help in this project very much. If you have any questions or comments, please do not hesitate to contact me or my supervisor, Dr. Papadopoulos, at the above address or fax/phone numbers or by e-mail at <ibsg@business.carleton.ca>.

Sincerely,

Daniela De Cecco
Graduate student
Master of Management Studies program

Appendix P - Questionnaire

**The International
Business Study Group**

School of Business
Carleton University

**Profile of selected
North American
technology regions
as locations
for investment**

Thank you for agreeing to participate in this project. The study seeks to determine the relative attractiveness of five regions in North America as potential locations for investment by technology firms in the computer hardware and software and telecommunications sectors.

Following are some key definitions and guidelines that will help you complete the survey.

An **investment** may be anything from a small sales office to a manufacturing facility or any other local presence directly by your company, representing a transfer of capital and a degree of managerial commitment greater than dealing with a region from afar. Since we are interested in your personal views as an executive in the technology sector, it does not matter whether the company you work for is a headquarters or a subsidiary which may or may not be empowered to invest elsewhere.

Technology cities and regions are those with a high concentration of firms in the above and related sectors. Those included in this study are:

- * **Palo Alto** and the surrounding area in the state of California, U.S.A.
- * the **Raleigh-Durham-Chapel Hill** area in the state of North Carolina, U.S.A.
- * **Ottawa** and the surrounding area in the province of Ontario, Canada
- * the **Guelph-Cambridge-Kitchener/Waterloo** area in the province of Ontario, Canada
- * **Route 128** near Boston in the state of Massachusetts, U.S.A.

It does not matter whether or not you have had personal experience with these cities and regions, and there are no "right" or "wrong" answers. What matters is your overall impression about them, regardless of how it was formed.

To contain the length of the questionnaire we have limited the number of regions we specify to five. But, since there may be other regions of special interest to you or your firm, the questionnaire includes an option for you to add a sixth region (or more) and evaluate it as well, if you would like.

It is important that you answer all the questions so that we obtain a complete set of questionnaires from the complete sample -- *please do not omit any!* For most questions, all you have to do is check off a box or circle a number. We sincerely appreciate your help.

If you would like to receive a **summary of the results** as soon as possible, please check here and provide your name & address so we know where to send it (clip your business card to this page or attach a separate sheet). *To maintain the anonymity of results, the returned envelopes will be opened by a different person who will forward the surveys to us separately from the requests for summaries. This cover page will be discarded after checking off your response against the mailing list based on the serial number.*

serial no. _____

To return the completed questionnaire, please mail to:

IBSG - Technology Region Survey
School of Business, Carleton University
1125 Colonel By Drive, Ottawa, Canada K1S 5B6

1 Importance of Investment Objectives

This section assesses the importance of various objectives when firms in your industry consider a new investment in North America beyond the regions(s) in which they currently operate -- in other words, *the motives that drive decisions to expand by investing in new regions*. **From your company's perspective**, please rate the **importance** of each of the following possible **objectives** on the scale below.

	(circle the appropriate number)				
	Not important at all				Very important
To get closer to existing or potential customers	1	2	3	4	5
To get closer to major suppliers	1	2	3	4	5
To follow competitors who have invested there	1	2	3	4	5
To protect existing markets	1	2	3	4	5
To get closer to major new markets	1	2	3	4	5
To access special design, engineering, & other skills	1	2	3	4	5
To benefit from lower labour costs or higher productivity	1	2	3	4	5
To lower production costs	1	2	3	4	5
To overcome inter-state or inter-provincial trade barriers	1	2	3	4	5
To benefit from local government incentives	1	2	3	4	5
To benefit from state or provincial incentives	1	2	3	4	5
To benefit from federal government incentives	1	2	3	4	5
Other (pls. specify) _____	1	2	3	4	5
<i>Specifically concerning investments in another country:</i>					
To meet government requirements	1	2	3	4	5
To overcome national trade barriers	1	2	3	4	5
To locate in a better climate for investment & business	1	2	3	4	5
<i>respondents in Canada:</i> To establish US presence	1	2	3	4	5
<i>respondents in US:</i> To establish Canadian presence	1	2	3	4	5
To benefit from or guard against currency fluctuations	1	2	3	4	5
Other (pls. specify) _____	1	2	3	4	5

2 Importance of Location Variables

This section assesses the importance of various characteristics of potential investment locations in North America for firms in your industry -- that is, *the characteristics that a particular location must have to be considered more attractive than others*. **From your company's perspective**, please rate the **importance** of each of the following location characteristics on the scale below.

	(circle the appropriate number)				
	Not important at all				Very important
Proximity to major customers and markets	1	2	3	4	5
Proximity to large urban centres	1	2	3	4	5
Proximity to complementary or competing companies	1	2	3	4	5
Proximity to suppliers	1	2	3	4	5
Proximity to other existing operations of our company	1	2	3	4	5
Size and potential of local market	1	2	3	4	5
Availability of venture capital	1	2	3	4	5
Presence of universities & industry research centres	1	2	3	4	5
Presence of leading companies or entrepreneurs	1	2	3	4	5
Access to R&D facilities	1	2	3	4	5
Availability of suitable sites in research/technology parks	1	2	3	4	5
Overall level of technological advancement	1	2	3	4	5
Local availability of technical & professional services	1	2	3	4	5
Local availability of expert managers	1	2	3	4	5
Local availability of the right labour skills	1	2	3	4	5
Low labour costs	1	2	3	4	5
Industriousness of the work force	1	2	3	4	5
Overall physical infrastructure	1	2	3	4	5
Energy and related utility (e.g. water) costs	1	2	3	4	5
Housing, schooling & cultural/recreational facilities	1	2	3	4	5
Cost of living	1	2	3	4	5
Crime level	1	2	3	4	5
Overall quality of life	1	2	3	4	5
Physical climate	1	2	3	4	5
Government attitude to business & investment	1	2	3	4	5
Local tax climate for business	1	2	3	4	5
State/provincial & national tax climate for business	1	2	3	4	5
Availability of government incentives for investment	1	2	3	4	5
Regional regulatory practices	1	2	3	4	5
National regulatory practices in the region's country	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

3 Use of Information Sources

This section assesses the importance of various information sources that might be used when companies in your industry choose among alternative locations for investment. **From your company's perspective**, please rate the importance of each information source on the scale below.

	(circle the appropriate number)				
	Not important at all			Very important	
National or state/provincial government departments	1	2	3	4	5
Local government departments and agencies	1	2	3	4	5
Chamber of Commerce	1	2	3	4	5
Statistics & information published by local agencies	1	2	3	4	5
Outside consultants	1	2	3	4	5
Investment missions	1	2	3	4	5
Business magazines & newspapers	1	2	3	4	5
Own research surveys	1	2	3	4	5
Internet/ World Wide Web	1	2	3	4	5
Local real estate agents	1	2	3	4	5
Local law firms	1	2	3	4	5
Local business visits	1	2	3	4	5
Local pleasure visits	1	2	3	4	5
Educational institutions	1	2	3	4	5
Competitors that do business in the target regions	1	2	3	4	5
Other industry firms that do business in target regions	1	2	3	4	5
Suppliers and/or distributors	1	2	3	4	5
Customers in the target regions	1	2	3	4	5
Business partners at the target regions	1	2	3	4	5
Investment promotion materials by local/other agencies	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

4 Assessment of Investment Climate

This section examines how you *personally* feel about the technology centres as places for potential investment. On each of the next five pages you will find a different region to be rated (including the one where you are presently located -- please do rate it as well). There is also an extra page to rate one or more regions that may be of special relevance to you.

It is your opinions and feelings about what you would expect to find at these regions that is important. **You do not need to have extensive knowledge of the regions to respond.** You should work at a fairly high speed through the scales (there is no "right" answer and so there is no need to look back and forth or puzzle over individual items). **It is your first impression, your immediate "feeling", that counts.** Please look at each scale as separate from the rest and judge each region independently from one scale to the other.

4 (cont'd) Assessment of Investment Climate

... your personal assessment of the investment climate in and around:

Palo Alto, California

Put an "X" in the middle of the space closest to
your opinion (Please do not mark on the dividing line)

	Poor				Excellent
Proximity to major customers and markets					
Proximity to large urban centres					
Proximity to complementary or competing companies					
Proximity to suppliers					
Proximity to other existing operations of our company					
Size and potential of local market					
Availability of venture capital					
Presence of universities & industry research centres					
Presence of leading companies or entrepreneurs					
Access to R&D facilities					
Availability of suitable sites in research/technology parks					
Overall level of technological advancement					
Local availability of technical & professional services					
Local availability of expert managers					
Local availability of the right labour skills					
Low labour costs					
Industriousness of the work force					
Overall physical infrastructure					
Energy and related utility (e.g. water) costs					
Housing, schooling & cultural/recreational facilities					
Cost of living					
Crime level					
Overall quality of life					
Physical climate					
Government attitude to business & investment					
Local tax climate for business					
State/provincial & national tax climate for business					
Availability of government incentives for investment					
Regional regulatory practices					
National (US) regulatory practices					
Other (please specify):					
Overall assessment of the Palo Alto region:					
- in general					
- as a potential site for investment by your firm					

4 (cont'd) Assessment of Investment Climate

... your personal assessment of the investment climate in and around:

Raleigh-Durham-Chapel Hill, North Carolina

Put an "X" in the middle of the space closest to
your opinion (Please do not mark on the dividing line)

	Poor			Excellent
Proximity to major customers and markets				
Proximity to large urban centres				
Proximity to complementary or competing companies				
Proximity to suppliers				
Proximity to other existing operations of our company				
Size and potential of local market				
Availability of venture capital				
Presence of universities & industry research centres				
Presence of leading companies or entrepreneurs				
Access to R&D facilities				
Availability of suitable sites in research/technology parks				
Overall level of technological advancement				
Local availability of technical & professional services				
Local availability of expert managers				
Local availability of the right labour skills				
Low labour costs				
Industriousness of the work force				
Overall physical infrastructure				
Energy and related utility (e.g. water) costs				
Housing, schooling & cultural/recreational facilities				
Cost of living				
Crime level				
Overall quality of life				
Physical climate				
Government attitude to business & investment				
Local tax climate for business				
State/provincial & national tax climate for business				
Availability of government incentives for investment				
Regional regulatory practices				
National (US) regulatory practices				
Other (please specify):				
Overall assessment of the Raleigh region:				
- in general				
- as a potential site for investment by your firm				

4 (cont'd) Assessment of Investment Climate

... your personal assessment of the investment climate in and around:

Ottawa, Ontario

Put an "X" in the middle of the space closest to your opinion (Please do not mark on the dividing line)

	Poor			Excellent
Proximity to major customers and markets				
Proximity to large urban centres				
Proximity to complementary or competing companies				
Proximity to suppliers				
Proximity to other existing operations of our company				
Size and potential of local market				
Availability of venture capital				
Presence of universities & industry research centres				
Presence of leading companies or entrepreneurs				
Access to R&D facilities				
Availability of suitable sites in research/technology parks				
Overall level of technological advancement				
Local availability of technical & professional services				
Local availability of expert managers				
Local availability of the right labour skills				
Low labour costs				
Industriousness of the work force				
Overall physical infrastructure				
Energy and related utility (e.g. water) costs				
Housing, schooling & cultural/recreational facilities				
Cost of living				
Crime level				
Overall quality of life				
Physical climate				
Government attitude to business & investment				
Local tax climate for business				
State/provincial & national tax climate for business				
Availability of government incentives for investment				
Regional regulatory practices				
National (Canada) regulatory practices				
Other (please specify):				
<i>Overall assessment of the Ottawa region:</i>				
- in general				
- as a potential site for investment by your firm				

4 (cont'd) Assessment of Investment Climate

... your personal assessment of the investment climate in and around:

Guelph-Cambridge-Kitchener/Waterloo, Ontario

Put an "X" in the middle of the space closest to
your opinion (Please do not mark on the dividing line)

	Poor		Excellent	
Proximity to major customers and markets				
Proximity to large urban centres				
Proximity to complementary or competing companies				
Proximity to suppliers				
Proximity to other existing operations of our company				
Size and potential of local market				
Availability of venture capital				
Presence of universities & industry research centres				
Presence of leading companies or entrepreneurs				
Access to R&D facilities				
Availability of suitable sites in research/technology parks				
Overall level of technological advancement				
Local availability of technical & professional services				
Local availability of expert managers				
Local availability of the right labour skills				
Low labour costs				
Industriousness of the work force				
Overall physical infrastructure				
Energy and related utility (e.g. water) costs				
Housing, schooling & cultural/recreational facilities				
Cost of living				
Crime level				
Overall quality of life				
Physical climate				
Government attitude to business & investment				
Local tax climate for business				
State/provincial & national tax climate for business				
Availability of government incentives for investment				
Regional regulatory practices				
National (Canada) regulatory practices				
Other (please specify): _____				
<i>Overall assessment of the Guelph -Cambridge- Kitchener Waterloo region:</i>				
- in general				
- as a potential site for investment by your firm				

4 (cont'd) Assessment of Investment Climate

... your personal assessment of the investment climate in and around:

Route 128, Massachusetts

Put an "X" in the middle of the space closest to
your opinion (Please do not mark on the dividing line)

	Poor			Excellent
Proximity to major customers and markets				
Proximity to large urban centres				
Proximity to complementary or competing companies				
Proximity to suppliers				
Proximity to other existing operations of our company				
Size and potential of local market				
Availability of venture capital				
Presence of universities & industry research centres				
Presence of leading companies or entrepreneurs				
Access to R&D facilities				
Availability of suitable sites in research/technology parks				
Overall level of technological advancement				
Local availability of technical & professional services				
Local availability of expert managers				
Local availability of the right labour skills				
Low labour costs				
Industriousness of the work force				
Overall physical infrastructure				
Energy and related utility (e.g. water) costs				
Housing, schooling & cultural/recreational facilities				
Cost of living				
Crime level				
Overall quality of life				
Physical climate				
Government attitude to business & investment				
Local tax climate for business				
State/provincial & national tax climate for business				
Availability of government incentives for investment				
Regional regulatory practices				
National (US) regulatory practices				
Other (please specify):				
<i>Overall assessment of the Route 128 region:</i>				
- in general				
- as a potential site for investment by your firm				

4 (cont'd) Assessment of Investment Climate

... your personal assessment of the investment climate in and around:

Please name the region you would like to assess _____

Put an "X" in the middle of the space closest to
your opinion (Please do not mark on the dividing line)

	Poor			Excellent
Proximity to major customers and markets				
Proximity to large urban centres				
Proximity to complementary or competing companies				
Proximity to suppliers				
Proximity to other existing operations of our company				
Size and potential of local market				
Availability of venture capital				
Presence of universities & industry research centres				
Presence of leading companies or entrepreneurs				
Access to R&D facilities				
Availability of suitable sites in research/technology parks				
Overall level of technological advancement				
Local availability of technical & professional services				
Local availability of expert managers				
Local availability of the right labour skills				
Low labour costs				
Industriousness of the work force				
Overall physical infrastructure				
Energy and related utility (e.g. water) costs				
Housing, schooling & cultural/recreational facilities				
Cost of living				
Crime level				
Overall quality of life				
Physical climate				
Government attitude to business & investment				
Local tax climate for business				
State/provincial & national tax climate for business				
Availability of government incentives for investment				
Regional regulatory practices				
National (US or Canada) regulatory practices				
Other (please specify): _____				
Overall assessment of the _____ region:				
- in general				
- as a potential site for investment by your firm				

5 Similarities/Dissimilarities among Technology Centres

This section examines your personal feeling about how similar or dissimilar the regions are as potential sites for investment. Please put a vertical line across the bar to indicate the degree of similarity/dissimilarity between the regions in each pair, using whatever criteria you would like.

For example, if you feel Region A and B are fairly similar, you would put the vertical line like so:

a. The five regions among themselves

Palo Alto -- Raleigh-Durham-Chapel Hill

Palo Alto -- Ottawa

Palo Alto -- Guelph-Cambridge-Kitchener/Waterloo

Palo Alto -- Route 128

Raleigh-Durham-Chapel Hill -- Guelph-Cambridge-Kitchener/Waterloo

Raleigh-Durham-Chapel Hill -- Route 128

Ottawa -- Guelph-Cambridge-Kitchener/Waterloo

Ottawa -- Route 128

Route 128 -- Guelph-Cambridge-Kitchener/Waterloo

Raleigh-Durham-Chapel Hill -- Ottawa

Highly
dissimilar

Highly
similar

b. The five regions versus any extra region(s) you may have added and rate earlier. Your extra regions is: _____

Palo Alto --

Raleigh-Durham-Chapel Hill --

Ottawa --

Route 128 --

Guelph-Cambridge-Kitchener/Waterloo--

c. Similarity/dissimilarity of the regions versus Canada and the US, overall, as potential sites for investment

Canada -- Palo Alto

Canada -- Raleigh-Durham-Chapel Hill

Canada -- Ottawa

Canada -- Guelph-Cambridge-Kitchener/Waterloo

Canada -- (your extra region: _____)

United States -- Palo Alto

United States -- Raleigh-Durham-Chapel Hill

United States -- Ottawa

United States -- Guelph-Cambridge-Kitchener/Waterloo

United States -- (your extra region: _____)

United States -- Canada (the countries overall)

6 Overall Knowledge About the Regions

This section examines your views about "what comes to mind" when you think of the regions in this study. Please answer these questions from your *personal* perspective and regardless of how much specific experience you may or may not have with any of the regions.

(to answer, use single words or combinations as you may prefer)

	Palo Alto (California)	Raleigh-Durham- Chapel Hill (N. Carolina)	Ottawa (Ontario)	Guelph-Cambridge- Kitchener/Waterloo (Ontario)	Route 128 (Massachusetts)
What is the first thing that comes to mind when you think of each region? (anything, whether or not it is related to this study)					
In your opinion, what is the single most important distinguishing feature of each region in general?					
In your opinion, what is the single most distinguishing feature of each region specifically from a technology standpoint?					
Of the high technology companies which you know to have their headquarters in each region, which three or four come to mind first?	_____	_____	_____	_____	_____
Over time, some regions have acquired various "nicknames" which often differ between the locals and people elsewhere. If you are aware of any such nickname (s) for any of the regions, could you please provide it here?	_____	_____	_____	_____	_____
Lastly, would your firms consider any of the regions for new investment? (✓)					

7 Background Information

This section asks for background information which will help us classify your answers. Please be assured that your responses are **anonymous** and will only be used to analyze the data statistically.

Is the company from which you are responding: <div style="display: inline-block; width: 30%; text-align: center;"> a headquarters ☐ ? please answer these questions only </div> <div style="display: inline-block; width: 30%; text-align: center;"> or a subsidiary ☐ ? please answer both sets of questions </div>		
Year of founding Primary business: Major product group (s): Approx. sales (\$) Approx. exports, if any (\$) -currency for the above (✓) Approx. no. of employees (#)	19__ _____ _____ _____ _____ US\$ ☐ C\$ ☐	19__ _____ _____ _____ _____ US\$ ☐ C\$ ☐
Where are you located? City _____ State/Province _____ If different, where is your firm's headquarters? City _____ State/Province _____		
In which of the other five regions in this study, if any, does your company also operate? Palo Alto area CA ☐ Raleigh-Durham-Chapel Hill area, NC ☐ Route 128 area, MA ☐ Ottawa area, ON ☐ Guelph-Cambridge-Kitchener/Waterloo area, ON ☐		
Your title in the company: _____ Your area of responsibility if unclear from your title: _____ Your degree of responsibility for investment decisions in your company (✓ one): Total ☐ Major ☐ Minor ☐ No responsibility ☐		
The role you play in investment decisions in your company (✓ as many as apply): Initiating decision process ☐ Collecting/analyzing information ☐ Scouting locations ☐ Choosing location ☐ Making final decision to invest ☐ Implementing decision ☐		
In general, would you describe your background as being in (✓ one) Engineering ☐ Finance ☐ General Management ☐ Marketing & Sales ☐ Human Resources ☐ Other (pls. specify) _____ Your education (✓): High School ☐ Bachelor degree ☐ in? _____ Some College/Univ. ☐ Master's or higher ☐ in? _____ Your sex (✓): Male ☐ Female ☐ Your age group (✓ one): 29 or less ☐ 30-44 ☐ 45 or more ☐		

8 Would you like to comment? We'd *really* appreciate it!

We know how busy you must be and we very much appreciate your contribution to this project. As you can tell from the questionnaire, it takes a lot of effort to design and carry out a study such as this, which is intended for the benefit of many different people in the business, government, and research communities. Any comment you can add, on any specific or general matter related to the project, will be very valuable and will help improve our future research and its usefulness to others.

The quantitative findings from the questionnaire will be analysed by various statistical techniques such as principal components (factor) analysis, multivariate analysis, and multidimensional scaling. Comments which may add here will be transcribed and used to help interpret the quantitative results. Please use this [age or attach additional sheets if necessary.

And please remember – if you would like to receive the executive summary of the findings, just check on the questionnaire's front cover.

we sincerely THANK YOU for your contribution!

IMAGE EVALUATION TEST TARGET (QA-3)

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