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**Responding to the New Economy—Capitalizing on Information and
Communication in a Network-based Economic Model**

The Case of Canada's Technology Triangle

by: Rose D. Sottile, M.A.

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

School of Journalism and Communication
Carleton University
Ottawa, Canada
March, 2000
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**Responding to the New Economy - Capitalizing on Information
and Communication in a Network-based Economic Model
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in partial fulfilment of the requirements for
the degree of Master of Arts

Thesis Supervisor

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Abstract

Based on a case study of an area in southwestern Ontario known as Canada's Technology Triangle (C.T.T.), this thesis presents the industrial district as an economic model that can engender success in today's environment. Through a commitment to collective learning and an appreciation for the transformative effects of information and communication, companies can band together and achieve an economic advantage over other companies in a global marketplace. Companies in C.T.T. have redefined their competitive relationships with one another and allowed a flexible approach to permeate their endeavors. They have left behind the binding constraints of an equilibrium framework and embraced an evolutionary philosophy wherein their growth is the product of an organic process of reinvention. Companies have adopted an all-encompassing approach to business that includes buyer-vendor relations, interfirm associations, institutions and industrial policies. This approach can set the stage for businesses to achieve success in the current business environment.

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Introduction

INTELLECTUAL HISTORY OF THIS THESIS

This thesis began as a study into how high technology enterprises are being used to spur economic growth. As such, I undertook an investigation of an area in southwestern Ontario that is recognized for excellence in the high technology sector. The area chosen for this research is popularly referred to as Canada's Technology Triangle (C.T.T.) and encompasses the cities of Kitchener, Waterloo, Cambridge and Guelph. In investigating the relations in C.T.T., it became apparent that businesses are not simply engaged in an alternate economic pursuit; rather, they are conducting business in ways that break with the conventional wisdom of neoclassical economic principles. This reality captured my interest and my research was soon diverted away from my original point of inquiry.

While investigating relations in C.T.T., I recognized that underscoring the internal decisions and motivations that propel business in the region is a new business reality. I believe that capitalism is at a critical juncture in its history where different regimes of accumulation are intersecting and new demands are being placed on capital and the state. It has been remarked that

industry is currently undergoing a massive transformation and moving towards new forms of organization required by technological development. The problems caused by structural adjustment, together with the territorial impact of complex processes of restructuring undertaken by businesses, have led to local government authorities in the major industrialized countries being increasingly interested in developing an industrial policy to deal with them (Bellini et al, p. 171).

Regional authorities and capital are grappling with the new circumstances and the C.T.T., with its industrial district framework, represents one course of action that

businesses may undertake in responding to the new order. The model being implemented in C.T.T. and in industrial districts around the world can become an instrument for local authorities to use in *dealing with* the changes that capitalism is facing. The manner in which businesses in C.T.T. interact with one another and their understanding of external markets appear to advance their success and offered me a cornucopia of research opportunities.

Consequently, I set out to uncover *how* companies in C.T.T. are able to come together and achieve economic success in today's changing business environment. Ultimately, the answer was found, not with the individual firms themselves, but along the boundaries where individual companies interacted with one another and embedded within the relationships that flowed from these interactions. In addition, the processes that are underway in high technology centres throughout North America are not unique to that industry. Instead, they harken back to the relations that evolved during the period of craft production and continue to be omnipresent in the business relationships that exist in the ceramic and textile industries in Italy's renowned industrial districts.

In the late 1970s, Becattini, a student of Italian industrial development, advanced the idea that it was no longer sufficient to use the single firm as the unit of analysis. He advanced that a cluster of interconnected firms located in a small area needed to become the unit of study (Brusco, p. 14). This thesis is conducted in the spirit of Becattini's assertion and the belief that the factors that motivate individuals to partake in an industrial district are central to unraveling the mystery that often surrounds industrial success stories. What was initially a study on the rise of a new industry and its impact on

labour, work and interpersonal relations became a study on how businesses can come together to collectively achieve success.

This thesis presents the industrial district as one possible permutation for success in the new economy. It reflects on issues of communication and information that have previously been absent from discussions surrounding local economic regeneration. In particular, it looks at how internal, external and institutional communications can be organized in order to create a sustainable economic model for development. In addition, it examines some of the conditions that have made it possible for C.T.T. to emerge as a successful experience in a world where capital, markets and the state are recreating themselves on an ongoing basis.

Chapter 1

FOUNDATIONS

SECTION 1: INTRODUCTION -- COMPONENTS OF THE STUDY

All levels of government are studying changes in industrial structure in order to develop policies that will facilitate prosperous and sustainable economies. This thesis is a policy-relevant study into one possible business permutation that governments can consider in the context of today's economic reality. Using the industrial district as the locus of discussion, this thesis will explore how companies that are part of regionally situated economic experiments can organize their relationships with each other, key institutions and internally in order to compete and achieve success in the international marketplace.

This chapter will examine how some scholars have theorized the devolution of Fordism and the tendency toward flexible specialization as well as explore the possibilities for the industrial district form of organization to be successful in the current environment. It will provide a basic sketch of how a new business landscape is evolving and offer competing visions on how these changes can affect future prosperity. Further to this, infused with an historical appreciation of the different mutations that capitalism has undergone, it will advance that a new economic orthodoxy can prevail that will allow the small firm led industrial district to flourish as a form of industrial organization within a global market. It will demonstrate that local economies can be indigenous creators of wealth that can support the economic, social and cultural aspirations of a region. Based on the premise that an increased emphasis on global markets has opened avenues for local players to determine their own economic futures, this chapter will make the case for the adoption of the industrial district model.

Chapter two hones in on two missing pieces of the equation. The chapter will deal with information and communication and their roles in economics. It will revisit some of the discussions raised in chapter one and highlight why information and communication are traditionally underused or inefficiently applied in the marketplace. Anchored in the belief that without an appreciation for information, the local system will be at a disadvantage, it will present the principles of a communicatory approach to economics that is injected with information and communication. The thesis will advance that the application and an appreciation of information can improve economic relations for local economies and help secure the success of industrial districts.

Chapter three will present the findings of a case study that was undertaken specifically for this project. Exemplifying the success of a communicative approach to economic behaviour, this chapter will trace the important role of networks and networking in an economically vibrant area known as Canada's Technology Triangle (C.T.T.). It will tease out the central elements to the economic success of the region and present a model for development.

Chapter four looks toward the future. Relying on the lessons learned in C.T.T. and the experiences of other industrial districts; it will explore the possibilities for reproducing the industrial relations that were studied in the previous chapters. In addition, it will highlight some of the key factors that this thesis found to distinguish an industrial district premised on high technology companies from those with other industrial bases (i.e., textiles). Finally, it will consider the possibilities for future development offered by the industrial district model and emphasize some landmines and particular idiosyncrasies that policy makers should be aware of in the event that they attempt to replicate the industrial district model in their own jurisdictions.

SECTION 2: THE SHAKY EDIFICE OF FORDISM – TOWARD FLEXIBLE SPECIALIZATION

The period between the 1920s and the early 1970s is widely recognized as the age of Fordism.

It is named after Henry Ford who developed and made strides in fine tuning the mass production complexes that dominated the industrial scene during this era. Along with the mass production of standardized goods, the lynchpin of Fordism is its focus on economies of scale and a concomitant competitive advantage based on price. Fordism also entails the mechanization of production and the development of specialized machinery, assembly line practices, the technical division of labour, the proliferation of exclusive job descriptions and the democratization of consumption. Ironically, Fordism and the mass production complexes that supported it proved unable to sustain the pressures that the very system itself brought to bear on business.

In The Second Industrial Divide - Possibilities for Prosperity, Michael J. Piore and Charles F.

Sabel point out that factories premised on Fordist principles require sizable capital investments on dedicated machinery and large manufacturing plants along with a narrowly trained workforce.

Consequently, the capital investments required by mass production make it unfeasible to operate a plant when the output is not being maximized. The health of the system requires markets that are large enough to sustain an enormous output of a single product and stable enough to keep resources continuously employed (Piore and Sabel, Chapter 3). Thanks to monetary policy and the advent of wage and welfare policies, a stable economic base evolved wherein large quantities of standardized goods were distributed and consumed. In spite of this policy apparatus, this state of equilibrium would not endure and the system would ultimately falter under the pressure of the very supports that were put in place to sustain it. A number of analysts (Piore and Sabel, 1984; Best, 1990) concur that while government and business efforts to prolong the life of Fordism through the application of industrial policies to stimulate demand succeeded in the short-run to engender economic prosperity, they actually exacerbated the crisis that would follow. It is argued that while

their efforts succeeded at camouflaging the symptoms of the faltering system, their attempts did not actually remedy the root causes of the crisis that were embedded in the impracticality of mass production.

Piore and Sabel explain that when a general stagflation of mass markets transpired, large corporations espoused various techniques to protect themselves from the impending downturn in the market (Piore and Sabel, Chapter 8). Among the tactics that were employed were the development of conglomerates (whereby investors diversified into other industries) and the evolution of the multinational company (projection of the mass production paradigm from a national to a multinational scale -- also known as international Fordism).

In spite of these efforts, industry was unable to overcome the realities of the marketplace. In the case of conglomerates, investors found that they were getting involved in another poor venture and using tools that were not able to respond to the current flexible demand. They failed because the basis of the entire economic system was in crisis -- not just their particular industry. In the case of multinationalization, there were a number of hidden costs that offset any potential benefits that the creators anticipated (Piore and Sabel, p. 200). Piore and Sabel advance that, "the present deterioration in economic performance results from the limits of the model of industrial development that is founded on mass production: the use of special-purpose (product specific) machines and of semi-skilled workers to produce standardized goods (Piore and Sabel, p. 4)." These limits prevented businesses from responding to the specialized and changing demands of the market.

In an analysis of economic history, Michael Best echoes the sentiments of Piore and Sabel and points out that while mass production allowed capital to exploit advanced economies of time to extend throughput at a lower cost per unit, boosters of the system overlooked its inherent flaws. He

remarks that the high fixed cost structure of mass production inhibited the self regulating mechanisms of the market and ultimately undermined its own stability. Under the logic of mass production, companies expected to continually decrease the cost of inputs, increase their sales and attain greater profits. Consequently, capital set out to undercut their competitors. However, Best points out that this strategy can escalate into a price war, drive companies out of business and wreak instability in the business environment.

According to Best, the corporation evolved to moderate these problems. He explains that through corporations, institutional innovation in the form of interfirm cooperation emerged. However, this system was wrought with controversy. As Best explains American laws that forbade the creation of cartels provided a situation wherein mergers and interfirm cooperation grew with the result of collusive price setting strategies. Ironically, antitrust policies became an inadvertent means of encouraging vertical integration and the extension of a fundamentally unstable business configuration. Magnifying the dilemma, corporate law served to extend these realities. It provided a means whereby companies could conduct business by setting out the bounds for strategic options. Once again, this encouraged the growth of big business in the context of a marketplace that would not be able to sustain it in the long run.

Furthermore, the narrowly trained workforce presented another set of problems to the long-term success of Fordism. By taking the skill out of work, mass production had created a *mass worker* and instated a rigid division between mental and manual work. This had the effect of making labour a factor of production that neglected the human dimension of labourers and their capacity to think and innovate at the workplace. In turn, this meant that the individual labourer did not have the organizational wherewithall to implement, or even suggest, changes in product design or process. They merely served to extend the dominance of mass production. Upper level

management was not exempt from these problems. In fact, managers themselves felt anonymous and complained that they were hamstrung by the inherent constraints of a deskilled environment. Their daily routines were reduced to simply executing the directions found on the blueprint and they were consequently circumvented from suggesting any initiatives to help overcome the impending crisis (Murray, p. 9). Ultimately, when market demand changed, companies were not equipped to respond.

Ironically while this system proved detrimental to the long-term competitive advantage of companies operating under Fordism, some argue that it was quite beneficial to the advancement of the labour movement. In fact, it has been interpreted as a catalyst to the collective consciousness that emerged among the working class during this era. In particular, the advent of strikes and the birth of the collective agreement evolved under the pressures being exerted by Fordism and its rigid formulaic structure (Murray, 1988).

While Fordism was fated to collapse under its rigid structure and the unsustainable efforts directed at supporting it, the system's problems manifested themselves in many ways. According to A.J. Scott's study on the resurgence of flexible specialization and its effect on industrialization and patterns of regional growth, the Fordist system's crisis peaked with rising unemployment, incapacitated municipalities, stagflation and pressures from neo-conservative governments to shrink the welfare state. In part, it was no longer a government priority to support the mechanisms that had been put in place to sustain the system.

Furthermore, there was a fundamental change in consumption and the large rigid structures of mass production were not designed to respond to the changing demands of the market. A new era of designer capitalism was ushered in where the idea of keeping up with the Jones' was replaced with a "move to be different from the Jones' (Murray, p. 10)." This philosophy did not only apply

to consumer goods. It also applied to manufacturers and service providers who needed specialized parts.

In spite of these changes and radical departures from past regimes of accumulation, the reader should bear in mind that this thesis does not support the assertion that a particular moment in history marked a break away from the Fordist-era and the dawn of a new regime of accumulation. Rather, the devolution of the system is an ongoing phenomenon that is still underway today.

The new post-Fordist era can be differentiated from the past on the basis of flexibility, the nature of competition, the general relationship between the parts and the whole and the role of labour (Kaplinsky, p. 26). Robin Murray advances that in post-Fordism, flexibility in product, work, machinery and production scheduling replaces a system that is driven to achieve economies of scale by producing standardized products with dedicated machinery in an hierarchically stratified labour environment. He remarks that, "instead of using purpose-built machines to make standard products, flexible automation uses general-purpose machines to produce a variety of products (Murray, p. 10)." Murray also explains that innovation in product and processes determine one's competitive advantage in post-Fordism while in Fordism price was the primary factor.

In order to succeed in the post-Fordist era, Kaplinsky advances that one must focus on the links and relationships that exist between the groups of individual units involved in production. Alternately, in Fordism one concentrated on the individual machine, worker and firm in order to succeed - the networks and relationships are inconsequential to the Fordist model. Finally, Kaplinsky discusses labour. To enjoy success in post-Fordism, capital needs to view labour as a valuable resource that must realize its own potential in order for the firm to succeed. The labourer is the repository of skill, know-how and experience (see Chapter two for a discussion on experiential knowledge) and by extension, the means for propagating change and innovation.

Alternately, in Fordism, where price competition was the primary economic driver, labour was treated as part of the over all price complement that needed to be minimized in a drive to maximize profits.

The era that is following Fordism is posing significant questions about relations in the new economic environment and how the new business landscape will evolve. It is an era of flexible production. The crisis of the mass production system has forced companies to re-evaluate their current conditions and seek out new relationships internally, externally, with their markets and with key institutions. In mapping out the evolution of business, Caroline Andrew, Francois Houle and Yvon Theriault explain that, "in strict economic terms, the disintegration of the Fordist model leads to a process of economic reconstruction that breaks with the classical model of hierarchical and bureaucratic communication at the same time as it develops a tendency toward regional agglomeration (Andrew et. al, p. 331)." While this thesis will only examine regionally focused economic experiences, it is important to acknowledge that systems that are globally focused and do not make a concerted effort to foster positive relations at the local level may also meet their economic targets and can prove to be socially responsible corporate citizens. In addition, as an unintended consequence, they may also produce vibrant local economies.

The shape of the current landscape is being understood differently by various analysts. Their views range from a utopian vision of a post-Fordist world where positive relations between labour and capital can emerge to one where the mechanics of flexible accumulation signal the deepening of capitalist hegemony and the continued oppression of the working class.

For the purposes of this analysis, the literature has been divided on the basis of whether the authors feel that the industrial district model can succeed over time or not. However, before

exploring these perspectives, a sketch of an analytical framework will be outlined that will lay out the parameters for the rest of this analysis.

SECTION 3: EVOLUTIONARY THEORY TRUMPS EQUILIBRIUM THEORY

During the period of mass production and the reign of Fordist principles, mainstream economic thought was premised on equilibrium theory and the principles of price competition. Under the conditions of a perfectly competitive market, the prices for inputs and outputs are used to determine the level of economic activity taking place (i.e., demand and supply). In crude terms, companies that are able to drive down their marginal costs and provide a product at the lowest price are successful under the logic of Fordism.

In The Second Industrial Divide, Piore and Sabel acknowledge the shortcomings of competition based on price. As part of their thesis, they advance that “competition guarantees only that the weak must follow the lead of the strong, not that the strong have found the uniquely correct solution to common problems (Piore and Sabel, p. 15).” Price competition provides little latitude for flexibility and fails to respond to the demands of a flexible era where the marketplace is seeking unique products to fulfill a number of needs. Under Fordism, firms direct their actions to responding to external conditions and changes. Local economies are consequently subsumed in the trajectory of national policies that tend to follow the lead of the global economy. Even in a post-Fordist era, the efficient allocation of resources in the context of a global economy precedes the well being and innovative capacity of communities and circumvents the potential for indigenous growth and the development of sound local economies.

Economic understanding based on these principles can lead to the development of rigid global spanning and often times, socially regressive business configurations. Most importantly however,

structures premised on equilibrium theory are not as adept at rising to the demands of the flexible age as those companies that have left its principles behind.

In part, shifts in consumption and competitive relationships have called for a new means for perceiving economic relations. This new understanding should be premised on process theory, namely the processes that determine the range of available innovations and the processes that alter the relative contributions that innovations make to economic welfare. There needs to be a shift in how economic prosperity is measured and a redefinition of the incentives to development.

A framework that embeds innovation and flexibility into the language of economic behaviour has been referred to as evolutionary theory. J. S. Metcalfe advances that “the adaptive evolutionary policy maker is far more concerned to influence process than to impose predetermined outcomes, far more concerned to enhance the adaptive learning capabilities of firms (Metcalfe, p. 31).” Evolutionary theory sheds the vestiges of price competition in exchange for a system where those decisive costs and quality advantages that arise from innovative behaviour can drive economic development. According to Metcalfe within evolutionary theory, the firm is concerned with endogenous changes and does not prioritize external changes and try to adjust to an equilibrium state. Evolutionary theory does not presuppose that *market realities* exist, rather it sees the market as a process that can be shaped by the strategic course which organizations and governments choose based on endogenous growth and development.

This is not simply about pressure to reorganize in the spirit of new production regimes. It extends beyond the parameters of the firm and encompasses buyer-vendor relations, interfirm associations, institutions and industrial policies. This extra-firm environment is a necessary component to the success of a creative and innovative firm as it provides the context within which

the relations of evolutionary theory are rooted -- without this complex, the firm will be at a competitive disadvantage in the international market.

For Michael Best, economic success in the new environment necessitates not only new business structures, but a new way of understanding economic relations that is founded on innovation, a lateral flow of information and system-wide learning. Best uses the language of the Old and the New Competition to differentiate between the types of market conditions that characterized business during Fordism and those of the flexible period. In his view, the new economy will hold the promise for richer economic, social and personal relations. The two regimes are differentiated on the basis of the organization of the firm, the types of coordination across phases in the production chain, organization of the sector and patterns of industrial policy. In each of these four categories, the firm espouses a strategic course of action because it shapes rather than reacts to the market.

The New Competition entails breaking down the rigidities of planning and doing and venturing into the territory of the *learning firm* where planning and doing are a part of the individual worker's job description (Best, p.134).

Although other characteristics are important in the New Competition, the learning firm is at its core. The learning firm chooses a strategic orientation and seeks to establish its advantage on the basis of innovation. It is only through innovation that change occurs and that a competitive edge can be obtained. Innovations are not restricted to the complete overhaul of a system, rather it can simply refer to the incremental changes that ensue from business interactions. Firms operating on the principles of the Old Competition engage in efforts to minimize production costs and compete on the basis of increased efficiency. Alternately, firms operating within the logic of the New

Competition are motivated by improvements to the structure and form of both their product and manufacturing systems.

In order for the learning firm to make the incremental changes that it considers necessary and that the market demands, it must have organizational flexibility at the level of micro production.

The success of the learning firm is contingent upon the possibility for individuals to interact and discuss their jobs. This facilitates their ability to continually innovate and meet the market's needs.* For example, in the context of the evolutionary environment a blueprint is not provided by the purchaser -- the supplier is simply provided with the buyer's objectives and the supplier is left to decide how to achieve the desired results. This strategy enhances the capacity of the learning firm and allows both the supplier and the purchaser to succeed and use their individual expertise.

An important qualification that must be made is that although the logic of productive strategies within the New Competition/evolutionary theory changes, the fundamental principles of work and capitalism remain consistent. It has been argued that the new era means that we have entered "a world where the workplace no longer represents the site of the principle social conflict, the entrepreneur has no longer necessarily the same social connotation as before. Previously condemned to be the clear and consistent enemy of progressive social action, the entrepreneur has now been reinterpreted as, under some conditions, the ally of cultural innovation (Andrew et al., 1993, p. 333)." In his book Divided Societies, Ralph Miliband responds to the resistance being advanced by both the Left and the Right against the use of class struggle as a valid basis for analyzing society. Among the criticisms lodged by the Right is a belief that the very notion of a working class is dubious. It is argued that sizable gains have been enjoyed by society at large that

* These needs are not a simple byproduct of market activity but are in fact the result of a successful capitalist system. Capitalism is, in part, successful because it is able to make the consumer want more of what capitalism

have created more democratic relations across both business and social lines. It is argued that these advances invalidate the claim that the working class is at a disadvantage in the broader complex of capital, social and labour relations. There is a similar disdain for the notion of class conflict launched by the Left. Some argue that new patterns of work and divisions of labour have created cleavages along other lines (such as gender and race) that undermine the notion of a single working class and have introduced new distinctions that are, at least, as important as class. Miliband debunks these arguments by revitalizing the concepts of exploitation, domination and coercion within a capitalist society. He stresses the importance of removing oneself from the strictly economic bias that limits the scope of the current debate and negates the political and social nuances that are a part of class struggle. Regardless of the changes (technological, patterns of consumption, new divisions of labour), Miliband argues that the substance of the exploitive relationship between capital and wage labourers has remained consistent (Miliband, 1989). He specifies that “even though class analysis does run the danger of a simplistic kind of economic reductionism, such a deformation is not inherent in the mode of analysis itself, and that, handled with all due care, it does constitute a uniquely valuable approach to the interpretation of social reality (Miliband, p. 2).” One must bear in mind that the New Competition/evolutionary theory does not signify a move away from capitalism, it is simply a mutation (albeit one from which richer social and economic relations can flow) of its necessarily exploitive logic.

SECTION 4: THE INDUSTRIAL DISTRICT -- INDEPENDENT CONCENTRATED REGIONAL POCKETS OF INDUSTRIAL DEVELOPMENT

Among the possibilities for organization under the logic of the New Competition/evolutionary theory is the locally configured industrial district. Unlike other locally situated industrial experiments (i.e., the incubator), the industrial district marks a move away from equilibrium theory and price competition. In an incubator an economic agent, such as a government, philanthropic

itself considers to be necessary (i.e. the material products of capitalism)

university or benevolent parent company (for example), effectively protects a young company from the realities of business. It shields companies from the outside world by providing them with exemptions from various laws or monetary supplements. Alternately, companies within the industrial district band together and effectively CHANGE the rules of the game and collectively advance their own success in a global market.

Within an industrial district model, the small firm has the capacity to achieve economic success and contribute to the overall vitality of a region as a result of its relations with other firms within a geographically defined area. In a paper on the Italian industrial district, Carlo Trigilia explains that, "the industrial district, rather than the isolated small firm, is the unit of analysis for this form of economic organization. The district ... is a sort of functional alternative to the large company. It has its own technological and productive dynamism, in addition to the ability to maintain high wage and employment levels (Trigilia, p. 34)." However, it is more than simply an economic construct and "should be conceived as a social and economic whole (Sengenberger et al., 1990, p. 2)"

The driving philosophy behind the district is that small firms cooperate with one another and lend one another tools as well as expertise as they collectively produce specialized products. Each small firm specializes in a particular component of the production process and responds to the demands of the external market based on a middle person/agency that links the district to the international market (Harrison; p. 77-78).

There is considerable debate among analysts about what characteristics are necessary for an area to be branded an industrial district (Sengenberger et al., 1990, p. 2). However, there is some consensus surrounding a number of essential characteristics. Among the defining characteristics of an industrial district is a focus on a particular industry. In the case of the Italian-variety of industrial districts (which are widely recognized as the quintessential industrial district

experiences), the actors are engaged in the production of a homogeneous product such as ceramics or textiles. This focus allows individual companies to achieve the economies of scale that would likely elude them if they were independent of the district and its concomitant collective expertise and resources in a particular industry. Alfred Marshall, the economic analyst who first described industrial districts explains that, "external economies could be obtained through the concentration of a large number of small firms engaged in a single industrial sector ... within a localized geographical area (Zeitlin, 1992, p. 280)."

The small, typically family-run firm is the darling of the industrial district because of the flexibility that it tends to engender. The large vertically integrated company is not a feature of the prototypical industrial district. Instead, small firms band together to create what Michael Best refers to as a *collective entrepreneur* whereby companies enjoy inter-dependency with one another. In addition, they can achieve the benefits of economies of scale that are usually only associated with the large firm while still benefiting from their own small size.

The mere existence of small firms within an area is not a sufficient factor to ensure the success of the district. Rather, the firms must tap into their capacity to adapt to new business opportunities and cooperate with business partners in the district. Sengenberger and Pyke explain that, "assisting this capacity for adaptability is a highly developed local accumulation of specialized knowledge and skill that is spread throughout the community (Sengenberger et al., 1990, p. 2)." Within the prototypical industrial district, there is a continual realignment and reassignment of roles among firms in the district. This adaptability makes it possible for firms to meet the ever-changing demands of a flexible market. A company may be a lead company on one project and the next week, find that it is a supplier. Collaboration between companies in industrial districts is a central element of their success. A cooperative esprit has taken root in industrial districts. This

characteristic was prevalent in the data gathered for this thesis. One should however, keep in mind that competition is actually combined with cooperation in industrial districts. In an article entitled "The Idea of the Industrial District: Its genesis", Sebastiano Brusco echoes a theme articulated in The New Competition by Michael Best. Both analysts explain that while a cooperative framework is required to sustain a district with respect to technical innovation and business relations, there is strong competition among firms engaged in the same pursuits. Furthermore, Piore and Sabel explain that in successful industrial districts, regional institutions were created that balanced cooperation and competition among firms so to encourage permanent innovation.

One final item that should be stressed is that there is not a decision making centre in the district. "The fact that the firms connected to the final markets are numerous and independent of one another prevents the district from having one single head. The market is clearly national and international although the 'stage firms'* work only indirectly for the international market (Brusco, pp. 14-15)."

SECTION 5: THE SURVIVAL AND EXTENSION OF LOCAL INDUSTRIAL DISTRICTS

In a study of economic regeneration for the International Institute of Labour Studies, Pierre André Julien defines the challenges, and opportunities, being faced by industrial districts in the Canadian context. He explains that the primary problems being faced by industrial districts are a result of changes in the economic, sociological and technological dimensions of life (Julien, p. 197-198). A political dimension should be added as a fourth element to this analysis to accommodate government actions that have shaped the new order and shed light on how institutional power relations have changed over time.

* A 'stage firm' is a business unit that supplies component parts to a purchasing firm who then prepares a market-ready product.

Economic

Among the most pointed attacks on the local success story, Julien explains that markets are increasingly global markets. He advances that more than ever, economic policy is being characterized by an international openness that seems to defy the logic of industrial districts. Julien illustrates that an international opening-out has led to a "new confrontation between local economies and international markets (Julien, p. 198)." While this epochal shift can on the one hand signal the demise of the local experience, it can also simultaneously stimulate new forms of interfirm cooperation and advance the ongoing development of local economic experiments.

Upon a close examination of the factors that influence companies and institutions as they grapple with the realities of the new global order and the flexible environment, Anna Lee Saxenian argues that paradoxically, "the creation of regional clusters and the globalization of production go hand in hand, as firms reinforce the dynamism of their own localities by linking them to similar regional clusters elsewhere (Saxenian, p. 5)." Michael Best's studies have led him to similar conclusions. Best explains that, "firms in network systems serve global markets and collaborate with distant customers and suppliers, and competitors. Technology firms in particular are highly international. However the most strategic relationships are often local because of the importance of timeliness and face-to-face communication for rapid product development (Best, p. 5)." That is, while geography is becoming less important to buyers who will contract companies around the globe to fulfill their orders, suppliers are increasingly concerned about situating their businesses in close proximity to like-oriented companies. They have come to recognize that while they do not need to locate close to their customers, their ability to fulfill their commitments is enhanced by being close to other suppliers who can provide easy access to resources and expertise in their particular field. This will in turn enhance their abilities to meet their targets.

In addition, Fordist regimes of accumulation are characterized by hierarchical communication flows between the lead firm (purchaser) and the supplier firms (or other departments within a single large company) wherein the major players are primarily concerned with the success and failure of their individual enterprises. The new environment of flexible accumulation requires flexibility in production methods to meet the demands of changing international consumption patterns and thereby necessitates lateral communication flows between firms -- this is very pronounced in the high-technology industry because it experiences rapid change. Locally configured business experiments have proven to be better suited to the lateral communication patterns that help firms cooperate locally and succeed in the international marketplace and they can consequently band together to champion production in the current era.

Technology and the Information Age

The move away from Fordism has been precipitated by an evolution in technology. Piore and Sabel remark that, "what is distinctive about the current crisis is that the shift toward greater flexibility is provoking technical sophistication ... Technological dynamism has thus allowed a shift from a purely reactive strategy, aimed at survival to an expansive strategy, which has threatened to cut ground away from mass production (Piore and Sabel, p. 207)." These changes can allow businesses to defy traditional time and space restrictions and set up global spanning production schemas. However, they may also open avenues for the industrial district to emerge as a viable source of economic development. In particular, this new equipment makes a range of tools available to companies that are better suited to the small firm and in turn to the success of an industrial district, should the institutional measures be put in place to help them in their pursuits.

Along with new manufacturing techniques and machinery, technology has facilitated the distribution of information. Studies have demonstrated that the adoption of information technology

by small and medium sized enterprises has been occurring at a faster pace than in large-scale business (Julien, p. 198/199).

Advances in technology have made it possible to distribute and obtain information that is necessary to the development of a sound regional economy. (This information can be provided through the extended service model of allocation -- see chapter four.) Specifically, it connects the region to the rest of the world. Information allows,

for the discovery or creation of new gaps opened up by market segmentation and by the development of the international market; information makes it possible to understand and respond to the new aspirations of the workers; information and training to prepare the next generation of entrepreneurs, information to pinpoint which of the available new technologies can assist a particular firm in becoming more competitive; information on new services. Information is essential, in short, as a basis for greater flexibility, creativity, and innovation (Julien, 1992, p. 199).

Interfirm organizations tend to treat information as a "public good" which is generally under supplied in the market and thereby facilitate the growth of industry in their area in the new era of flexible accumulation. The importance of information has been underestimated as its ancillary value has not been given proper consideration (Bates, 1988). (Information is not only provided electronically but is also available through formal and informal networks).

Anna Lee Saxenian's study of Route 128 and Silicon Valley demonstrates the importance of the flow of information. She attributes a great portion of Silicon Valley's success to its firms' willingness to share information with one another in order to benefit the Valley as a whole. Conversely, she explains that the inward looking, vertically situated firms in Route 128 that proved secretive and hoarded their information were destined to fail (Saxenian, 1994). Further, Route 128 lacked a cohesive and synchronized group of services which would foster its growth and development.

Michael Best explains how new technologies are being used and incorporated into the structure of these organizations. This is primarily accomplished through collective service centres that exist in the community. Centres purchase expensive equipment that its membership would not be able to purchase independently and then members enjoy access to the equipment. He addresses both the use of technology to maintain the district as well as the manner in which the district encourages the use of technology by the district (Best, p. 218-220). The interfirm associations in Emilia Romagna are connected to the international market and are thereby able to provide their memberships with the latest information (this maintains the district). However, the associations also purchase technical equipment (such as Computer Automated Design equipment) which their members would not be able to afford individually. This allows the individual firms access to technology necessary to their success.

Political

Along with the challenges being dealt to businesses as a result of the opening-out of world markets and the pressures exerted by the new information age, the political milieu is such that local actors can assume a central role in shaping the new economy. Carolyn Andrew, Francois Houle and Yvon Theriault contribute that there is both a political drive toward regional structures as well as an economic one. They remark that, "in strict economic terms, the disintegration of the Fordist model leads to a process of economic reconstruction that breaks with the classical model of hierarchical and bureaucratic communication at the same time as it develops a tendency to regional agglomeration (Andrew and Houle, p. 331)." Unlike Piore and Sabel who advance that a concerted effort must be made to create regional economic units, Andrew, Houle and Theriault believe that the current political and economic climate lends itself to the development of regional agglomerations of economic activity. Drawing on the example of Kanata Ontario, they comment

that new types of social networks are evolving between university researcher, private companies and local government actors to facilitate positive social and economic relations at the local level.

Local political spaces and, along with them, local political actors are enjoying a renewed importance as centres of economic, social and political development. Urban centres are seen as important actors on the international level. ... This reconsideration of the importance of the 'local' is, at least in part, related to the retreat of "senior" governments from social or economic interventionism and the resulting quasi-obligation on the part of local leaders to take up the challenges of economic development, the quality of life and the construction of social solidarity (Andrew, et al p. 327).

In an examination of the European experience, Robert Leondardi and Raffaella Nanetti explain that while Europe is undergoing a transformation toward a single market and national decisions are increasingly subsumed by those made at Brussels, there is a heightened appreciation of the importance of local actors in determining the success or failure of an area (Leonardi et al., p. 2). In an analysis of the Emilia Romagna experience, Leonardi and Nanetti report that,

only the region possessed the political vision and drive to consolidate this form of local capitalism based on social solidarity and political leadership at the micro level. Higher forms of political authority, as expressed by the state, have had great difficulty in operating in favour of small and medium-sized enterprises and have restricted such activity to the favouring of certain categories through fiscal measures, but have not been able to create a local environment for entrepreneurship and product experimentation as has been the case at the regional level (Leonardi et al., p. 7).

They also suggest that regional and local governments need to attune their antennae to factors beyond the parameters of their jurisdiction to uncover a strategy for organizing business in the current circumstances.

The political dimension has undergone a dramatic change that can be partially attributed to the push by private enterprise for deregulation. Claus Offe's principles of state interventionism explains that the national government is obligated to accommodate the economic development of multi- and trans-national business in Canada in order to maintain a viable capitalist state and

maintain the accumulation process (Offe, 1975). However, in doing this, the state reveals the contradiction of its will to political identification (i.e., the legitimizing factor which the state uses to justify interventionism within a capitalist framework) and its goal of international economic success (the capitalist state supporting efforts to maintain the accumulation process). The local and regional governments in Canada responded to the retreat of the federal government by assuming a leading position in directing their own economic situation in response to the demands for economic security by both the businesses and residents of the area.

The ultimate direction of the local government is to foster a set of relations in which the district is able to 'act as a collective entrepreneur' and achieve local cooperation that would allow it to gain an international competitive advantage. In other words, the local does not replace global, rather it simply plays a critical part in it.

Conclusion

The capacity for the industrial district model to overcome the challenges being dealt to it in this modern age of capitalism may not be viewed as positive opportunities for their future. However, with the proper forms of institutional intervention and the cultivation of a collective esprit, the locally situated industrial district model can provide a viable environment for business in today's economic climate.

Julien explains that in order to succeed, the local districts must "involve a heightened awareness of the development of national and international markets, a well-tailored adaptation of production organization to the new aspirations of workers and an increased sensitivity to technological transformations (as well as efficiency in introducing them), and a constant capacity for innovation (Julien, p. 200)."

SECTION 6: COMPETING PERSPECTIVES ON THE FUTURE OF INDUSTRIAL DISTRICTS

Negative

In his book, Lean and Mean - the Changing Landscape of Corporate Power in the Age of Flexibility, Bennett Harrison explains that industrial districts have a predisposition to deterioration. Government leniency and the proliferation of industrial districts have led to the emergence of inner city ghettos as "third world" relations emerge around the industrial district. He demonstrates that an area's evolution is partially done on the backs of an underclass that the system requires and by exposing people to dangerous work (Harrison; p. 107). Specifically, he explains that in Silicon Valley, the tendency of capitalism is to create ghettos by providing substandard wages to individuals who support the work undertaken at the core. There is a stark variation in the standard of life and the availability of social services in the core and the periphery. He explains that society is characterized by an hour glass wage distribution in which the middle is disappearing.

Harrison is quite critical of the existing literature and he explains that "the industrial districts of Italy are undergoing transformations away from the locally oriented, cooperative form ... believed to have held the key to their past success. Whatever these changes may hold for northern Italy, and for other regions like it, the larger implication is that small firm-dominated districts are probably as unlikely to lead a new wave of economic growth as are the individualistic entrepreneurs (Harrison, p. 106)."

Harrison believes that industrial districts are naturally predisposed to certain negative eventualities. Although small firms may be successful at the outset, their positions are prone to deterioration as the industrial district is likely to devolve. He draws on the cases in Emilia-Romagna, Veneto and Prato to illustrate the inability of industrial districts to generate long term

economic growth. He advances that these regions were once examples of the successful small firm led district but have since devolved as a result of hierarchical relations, problems associated with the lead firm and extreme fragmentation. Harrison's thesis is not simply that these new relations now characterize a previously prosperous region. Rather, it is that the very success of the regions were premised on assumptions that lent themselves to their inevitable deterioration.

In Emilia Romagna, the Sasib Company exemplifies what happens when a conglomerate enters a region and assumes the role of a lead firm. The region developed through the interrelations of independent enterprises that divided work among one another and shared information (in keeping with the tenets of the canonical industrial district). In order to realize the demands of the market, the region had configured itself as a non-hierarchical spatial production unit.

Its success made it an inevitable target for multinational take over (Harrison, p. 82). Harrison explains that these takeovers were responsible for "qualitatively transforming the non-hierarchical, collaboratively competitive nature of interfirm relations within the district (Harrison, p. 82)."

Sasib had previously acted as a lead firm; however, when it became a part of the Olivetti conglomerate, its objectives were no longer limited to the parameters of Emilia Romagna, but extended to encompass the entirety of Olivetti's interests. It thereby came to rely on outsourcing of peripheral tasks and a tiered set of relations between small subcontractors. It adopted these strategies on behalf of its parent company and in the name of decreased costs and increased efficiency.

Although the increased capital that Sasib brought to the region was attractive it placed the long-term success of the district, that was premised on trust and cooperative competition, at risk. Also, depending on Olivetti's plans, it could abandon the region at any time. Inevitably, hierarchical

relations and concentrated economic power characterized Emilia Romagna and undermined the collective will that had previously distinguished relations in the area

The lead firm relations of Benetton (a textiles and fashion manufacturer based in Treviso Italy) demonstrate a second fate, that may await the industrial district. As with Emilia Romagna, the Benetton story is one of a classical industrial district. The Benettons (a brother and sister partnership) developed an infrastructure of cooperatively competitive firms to assist with production. As Benetton became more developed and extended its product lines, it set out to create divisions within the company. Harrison explains that, "each line <constituted> a division with its own hierarchical tiers of closely dependent subordinate suppliers. Whereas suppliers and subcontractors in Brusco's and Becattini's ideal typical industrial districts gain part of their much-vaunted flexibility from 'changing partners', the price for doing business with Benetton seems to be a willingness to give up doing business with other companies in the district or elsewhere (Harrison, p. 91)." Benetton systematically broke down the principles of the district. Harrison remarks that "in its evolving role as a major oligopolist, rather than a 'cooperative competitor,' Benetton has measurably undermined at least part of the fabric of the Veneto's small firm network (Harrison, p. 92)."

Also, Benetton began to structure its operations in a manner that was characteristic of *any* other multi-national company and exploited home workers and the low wages available in some peripheral locations. That is, it stopped being responsible to the region and its people. Harrison believes that boosters of the industrial district system neglect that these negative characteristics are also part and parcel of the industrial district story. He posits that an account of Benetton's circumstances must include both positive and negative components of development and should not be limited to the positive relations at the core.

The final example that Harrison documents deals with extreme fragmentation. He believes that there are circumstances when work can become so decentralized that it becomes excessively disintegrated and firms are unable to withstand the pressure of the global market. He uses the example of Prato to illustrate his point. The big firms in this hitherto textile haven were outsourcing to branch plants that were located in areas where labour was cheaper -- these very same products were then made available in Prato and undermined the fabric of their industrial success story.

As with Emilia Romagna and Benetton, the relations that brought success to Prato eventually lead to extensive fragmentation and the ultimate breakdown of the area. Harrison explains that the extreme fragmentation increased the non-productive time of production and decreased the overall competitiveness of the region as a whole. This has been referred to as economies of time and inefficient throughput. The end result was that companies who had invested in machinery were pushed out as a result of debts and the non-innovative companies assumed dominance in the area. The extreme fragmentation ultimately circumvented the possibility for new ideas to flourish.

Other authors are also concerned about the fate of the working class within the industrial district model. For example, Andrew, Houle and Theriault, have some reservations. They caution that the new regime of flexible accumulation has the risk that, "it will lead to a pattern of dualistic development, excluding a wide variety of social groups from the new norms of consumption and in which only a minority of workers will have access to well-paid jobs (Andrew et. al, p. 334-335)."

Other analysts share these concerns. The basic theme that underlies the visions presented in this section is that they feel that the increased flexibility will leave the working class reeling from the ill-effects of dispersed spatial relations that the new flexible environment will allow capital to

exploit. While capital itself may enjoy increased prosperity, the consequences for the rest of society are too grave to endure.

David Harvey advances that flexible accumulation emerged in the early 1970s and that it is a post-Fordist era that is bound to post-modernism. In his opinion, the geopolitical and political economic relations that ensue from flexible accumulation encourage a system that is prone to crisis and will deepen capitalist hegemony. Harvey perceives Fordism as part of the larger modernist project that was tied to large-scale, technologically rational, austere and functionally efficient designs and that flexible accumulation corresponds to the eclectic post modern world (Harvey, p. 262). Arguing on the basis of the connection between post modernism and the era of flexible accumulation, David Harvey has pointed to patterns of uneven economic development that have followed the increased flexibility across both industrial sectors and geographic regions. He argues that by studying and understanding urbanization, one can untangle the details of the relationship between the political economic move towards flexible accumulation and the cultural aesthetic trend towards post-modernism. This will in turn allow one to achieve a better grasp of the consequences for the future. His view is that the regime of flexibility ushers in a stronger, more insidious era of capitalism where some geographic regions will prosper and others will fail. Specifically, he explains that the increased flexibility respecting the labour processes, labour markets, products and patterns of consumption result in a loss of agency for labour and encourage the development of disparate regional agglomerations of capital. Harvey maintains that

there are abundant cracks in the shaky edifice of modern capitalism not a few of them generated by the stresses inherent in flexible accumulation. The world's financial system -- the central power in the present regime of accumulation -- is in turmoil and weighed down with an excess of debt that puts such huge claims on future labour that is hard to see any way to work out of it except through massive defaults, rampant inflation or repressive deflation (Harvey, p, 282).

Others share Harvey's dismal outlook on the future within the flexible environment. Some caution that the material conditions of collective working-class politics will dissolve as a result of the increasingly international qualities of capital. The disorganized/disintegrated system will lack continuity and the working class will not be able to respond to capital in a coherent way. The centralized and concentrated industrial patterns of industrial banking and commercial capital in a regulated market that characterize Fordist systems are replaced by a system that is not anchored to a particular geo-political area. It has been argued that there will be an industrialization of the third world and competitive de-industrialization of core countries. They believe that a decline in blue collar working class will be accompanied by a decline in effectiveness of national collective bargaining.

The increased internationalization of capital and the capacity for companies to take advantage of increased spatial relations allow capital to increase the strength of its grip and leave labour unable to respond in a coherent and co-ordinated manner. This means that the social and economic causes that labour typically advances will not have an outlet to communicate its message through.

Positive

In spite of these criticisms, the industrial district model has a cavalcade of boosters who have rallied behind its principles. The authors discussed in this section share a common interest in advancing the possibility of prosperity through the locally configured economic units. They each bring a different part of the puzzle of economic regeneration to the table. They see potential for laterally organized and locally anchored systems of business to meet the demands of the new flexible environment. They believe that the new flexible environment can spawn numerous centres of independent growth that will not simultaneously create and rely upon regional pockets of disparity and that can, with the appropriate forms of institutional support withstand the test of time.

Frank Pyke and Werner Sengenberger explain that the appeal to industrial districts is three fold.

First, industrial districts are emblematic of the profound *industrial restructuring* which we have been able to observe in virtually all industrialized countries since 1975...Secondly, [the] theme touches on alternative ways of meeting the new *competitive challenges* posed to virtually all industrialized countries. ... Thirdly, [it is considered] worthwhile looking more closely into industrial districts because they might tell us something about perspectives and ingredients for *development* (Pyke et al., 1992, p. 6-7).

Recognizing the inability of companies to rise to the demands of the new flexible environment, Michael J. Piore and Charles F. Sabel ask, “how can firms turn the trick of reducing production costs while maintaining the flexibility necessary to thrive (often at the expense of mass producers) in economic uncertainty (Piore and Sabel, p. 205)?” Their answer revolves around flexible specialization, the re-emergence of the craft tradition and local pockets of industrial dynamism. Piore and Sabel advance the argument that there has always been a craft alternative to mass production and that it has always existed to either supply luxury goods, experimental products and to provide standardized goods for which demand was too unstable to make use of dedicated equipment. The economic prosperity of older industrial regions such as the Third Italy, and the areas around Salzburg Baden Wurttemberg captured the attention of analysts because they were flourishing as a collective unit while other regions were in decline.

Piore and Sabel explain that there are four faces of flexible specialization -- regional conglomerations of industry (discussed below), federated enterprises (common in Japan), ‘solar’ firms (orbiting firms) and workshop factories. Regional conglomerations of industry are composed of a core of more-or-less equal enterprises “bound in a complex web of competition (Piore and Sabel p. 265).” Its characteristics include that there is no permanently dominant firm, arrangements among firms are based on short term contracts where one’s role is always changing, there are institutions that facilitate the “recombination of productive enterprises” (i.e., trade associations,

unions, guilds, co-ops for purchasing material, marketing regional products, credit), and it rests on a fundamental sense of community which result in institutional forms of co-operation. This type of system can operate effectively within a global market and yet maintain the ability to set its own economic course. It is through this type of local set-up that regions are able to effectively compete internationally.

Other authors have maintained that locally based economy structures lend themselves to smart growth that is based on market networks and where participative leadership sets out the direction. The goals in such a flexible system are multiple and are no longer restricted to financial ones. The economic macro-system is not simply a profit-centered big business, but is a democratic free enterprise. The world system is no longer simply about a choice between capitalism and socialism, but there are hybrids of capitalism (including gentler versions) and socialism.

Charles Sabel remarks that the preponderance of flexible accumulation has prompted local government, small businesses and interfirm organizations to engage in the *extended service model* as a mechanism to adapt to the challenges being dealt to industrial districts. In the traditional *product-life-cycle model* “new products and industries are born in the most sophisticated and technologically advanced economies and then diffuse to less advanced and lower cost settings as the products and production processes become standardized and hence easier to master and transfer (Sabel, p. 231).” The shift from Fordism has meant that barriers to innovation need to be broken to facilitate access to capital, and access to technology. Capital and technology will make it possible for the local level to respond to the new international openness through the *extended service model*. The *extended service model* provides companies within a district access to the requisite components of production. For example, they are provided with access to managers (in both manufacturing and marketing) as well as access to trained technicians and workers (Sabel, p. 232). The *product-life-*

cycle model is not effective in the new environment because it is predicated on the assumption that there is an infinite demand for a particular standardized good. Conversely, the *extended service model* will help firms recognize where new growth areas are and help them develop and create products to fill those areas.

Responding to Criticisms

There is a concern that companies that participate in industrial districts will not be able to insulate themselves from shocks to international monetary systems and their economies will consequently collapse. This is part of the reason that Harrison supports the *kereitsu* style of economic development. The intermarket *kereitsu* is premised on the "one set principle" that entails that each horizontally structured network includes a company from each major division of industry, a lead bank, a foreign trading company and be connected to all of the important government ministries. The supply *kereitsu* is based on the principle that large corporations emerge and develop a network of suppliers and affiliates around them. Harrison is of the view that the Japanese style of co-operative networks is the best way to ensure economic stability and general prosperity during the flexible era. The *kereitsu* is founded on the premise of co-operation, a theme that recurs throughout a significant portion of the literature on business relations in the flexible environment. He explains that Japan is a leading example of how co-operative competition has been able to successfully evolve within a network form of industrial organization. Harrison explains that it allows "concentrated economic power <to> be reconciled with decentralized, cross-border production in ways that promote organizational learning, system wide innovation, and -- most of all -- flexibility in the face of competitive pressures (Harrison, p. 151)." It is important to realize that the supply and intermarket *kereitsu* do not exist independently, rather, they are interconnected as they supply *kereitsu* is always a part of a larger intermarket *kereitsu*

The pivotal point about these firms is that they engage in "obligational" contracting that is predicated on trust and sharing. Harrison suggests that this can be successful because it encourages innovation by spreading out the risk of doing business. He further explains that the small firm's confidence in receiving return business from the large companies increases and provides the small firm with an enhanced reputation in the business community. He believes that this will in turn provide increased access to resources (including capital, labour and training). Unfortunately, Harrison's solution requires global networks to emerge that will replicate the Japanese structure.

Unlike in the kereitsu model, the basis for success in industrial districts such as Emilia Romagna is the infrastructure that has been put into place by the Communist Party and interfirm institutions such as the National Confederation of Artisans in Emilia Romagna. The artisan associations have played a pivotal role in the evolution of the area's economic prosperity as they have provided collective services to its membership. The primary distinction between this type of an organization and a large company that can provide the same benefits is that the organization will have stronger links to the community. This in turn will help sustain the businesses of those in its membership. Best explains that "unlike Japan, the Third Italy is led by internally competitive independent small firms, strong unions, leftist political parties and an active citizenry at the local level (Best. p. 225)." The local industrial district model has more cohesion because it operates as a collectivity where the individual successes contribute to the overall well-being of the region. As will be further explained in the subsequent chapters, participants of the industrial district consider themselves to be *ambassadors for the region*. This bond cannot compare to the type of commitment that is felt toward a multinational parent conglomerate.

There is also an ongoing debate about the relative size of companies in the new environment. Michael Best and other proponents of small firm led industrial districts envision a system where the

small firm nurtures a collective identity in which it is possible for individuals to interact socially and politically as well as economically. The bottom line is that as Best points out "it is possible for a single firm to internalize each of the required functions but it cannot specialize in each. It is possible for a sector but not a single firm simultaneously to pursue distinct strategies. The result is that firms are mutually interdependent in that each depends upon the existence of others... Only then can it sustain the coordination required to develop the specialization and skills required to adapt continuously to new challenges (Best, p. 238)."

Conversely, Harrison explains that,

The more the economy is globalized, the more it is accessible only to companies with a global reach ... Dressed in new costumes, and armed with new techniques for combining control over capital allocation, technology, government relations, and the deployment of labour with a dramatic decentralization of the location of actual production, the world's largest companies, their allies, and their suppliers have found a way to remain at the centre of the world stage. (Harrison; p. 12)

Harrison maintains that small firms do not systematically advance technology and productive innovation, rather, it is only the very large firms who can afford to take the steps necessary to survival. Best counters that a strong infrastructure can produce comparable results as small firms can combine to form a 'collective entrepreneur' (in the form of Artisan Associations, government infrastructure, etc.).

Harrison also speaks out against the quality of employment within a small firm. He remarks that the small business evolution has coincided with the rise of Enterprise Zones, Thatcherism and deregulation. Further the standard of living is greater with big business. Harrison explains that "the employees of the big firms enjoy on average systematically higher wages, better benefits, and greater job security than their counterparts in small firms. These findings are replicated in a detailed study on the Canadian economy (Harrison, p. 50)."

Best paints a different picture. He explains that labour has benefited as a result of the strong artisan associations that characterize the Third Italy. The associations have achieved a strong voice for labour through the creation of multi-firm canteens. Also, the owners of small firms in the Third Italy worked in a union environment during their training and are committed to issues traditionally advocated for by unions (Best, p. 223).

According to Best, small firms have achieved stability without becoming huge vertically integrated firms through Marshallian relations. The "competitive edge of firms in an industrial district comes from the combination of ... specialization ... and ... flexibility ... to capture these opportunities an industrial district must be collectively entrepreneurial (Best, p. 234)."

According to The Second Industrial Divide, because flexible specialization does not rely on economies of scale and production systems are restricted to a locally defined area, it becomes likely that each nation can create a wide range of products on its own and be less dependent on fluctuations in exchange rates and commodity prices. In other words, a company can operate within a world market, but given the nature of its relations to its supplier/affiliate firms, it is not affected to a large degree by such fluctuations (Piore and Sabel, p. 277). While this may be able to sustain an industrial district system for a short while, this thesis maintains that a healthy global economy is required to support the outputs of regional economies and that over time, no system is immune to large-scale adjustments to the world market. That is, while the industrial district is not as susceptible to the machinations of the global economy as other business configurations, it will likely suffer the effects of a long-term global down-turn.

Harrison's criticism that successful industrial districts become marked for international take-overs does not stand up to scrutiny. He explains that takeovers were responsible for "qualitatively transforming the non-hierarchical, collaboratively competitive nature of interfirm relations within

the district (Harrison, p. 82).” In his example, Sasib had previously acted as a lead firm in the interest of the region of Emilia Romagna; however, when it became a part of the Olivetti conglomerate, its objectives were no longer limited to the parameters of Emilia Romagna, but extended to encompass the ‘world’. Harrison advances that under the new ownership structure, the company’s actions may in turn hurt the region. This logic neglects the fact that Sasib became an attractive company to take over because of the gains that it was achieving by being a part of a vibrant regional district. Should Olivetti expect Sasib to develop different relations, the very principles, which made it an attractive take-over in the first place, would disappear and both the parent company as well as the region will suffer. Because this is not in anyone's interest, it is not likely to transpire.

SECTION 7: CONCLUSION

This chapter has demonstrated that traditional mass production systems are untenable in the current business environment. Also, while the path to economic prosperity is not clear, it appears that the industrial district model might provide a means for attaining future success. Along with appreciating the benefits of an evolutionary theory to economic behaviour and re-energizing some central principles of craft production, economic agents must also grapple with business questions that are new and unique to the current environment. In particular, changes in technology and production processes have made information an important feature of economic success and an entity that must be injected into the debate and understood in the context of the current business environment. Chapter two will attempt to situate information into an economic equation for success.

Chapter Two

LOCATING INFORMATION AND COMMUNICATION IN ECONOMIC PROCESSES

SECTION 1: INTRODUCTION

The first chapter showed us that in spite of the difficulties that confront business in the flexible era, the industrial district presents a viable economic model for development. An industrial district is not a disparate agglomerate of companies that happen to share the same postal code; rather, it is a group of companies that have a dense matrix of relations with one another. They rely on one another in their efforts to excel in a specific industry/industrial sector and it is the activities that take place on the boundaries where these companies interact with one another that are ultimately responsible for determining the degree of success that a region can enjoy. Consequently, it is important to explore the intricacies of the communicative acts that these companies engage in. While many of the same themes that were introduced in chapter one will once again be addressed, this chapter will focus on communications and information.

At the root of this thesis is the belief that capitalism is at a critical crossroads. The economic strength demonstrated by regional conglomerations of industrial growth such as Silicon Valley, Emilia Romagna and Canada's Technology Triangle (C.T.T.) suggest that local economies can thrive in the new environment. However, the success of such systems is limited to the point that they can promote and sustain a dense matrix of economic behaviour wherein individual workers, firms and governments exist in communication with one another (across divisions within a firm and between companies). Traditionally, information has been underused by business and the possibility for new

forms of development to evolve has been thwarted. Antiquated theories and models for economic development and their concomitant conceptions of information must be broken down in order to prompt the creation of vibrant communities and foster local economies into self-sustaining nodes in the global economy rather than fleeting stars in a constellation of multinational companies.

As pointed out in chapter one, in The New Competition, a book devoted to studying the possibilities for economic renewal, Michael Best explains that today's economic environment varies from the past on the basis of the organization of the firm, the types of co-ordination across phases in the production chain, organization of the sector and patterns of industrial policy. In each of these four categories, the firm espouses a strategic course of action and it shapes rather than reacts to the market. It is not simply about pressure to reorganize in the spirit of new production regimes. It extends beyond the parameters of the firm and encompasses buyer-vendor relations, interfirm associations and industrial policies. Each of these networks facilitates the promulgation and diffusion of information. The existence of these links, as well as the data that are communicated through them, mark a change from the past and point to an expanded role for information. The uniquely malleable and transformative effect of information opens the door to economic transformation at the local level as companies learn to capitalize on the conditions that exist in the era of flexible specialization. Consistent with the thesis of Anna Lee Saxenian in Regional Advantage, a rich blend of interpersonal and business networks that work to diffuse information and support alternative models of production has promoted the success of California's Silicon Valley while its absence curbed development along Route 128. Similarly, a Leftist political agenda in conjunction with

familial relations and the existence of cooperative services have led to an economic prowess in areas such as Emilia Romagna, Italy. Likewise, in C.T.T., a combination of institutional intervention and inter-industry associations (formal and informal) has allowed the region to excel in high technology niche-market businesses. While these regions may vary in their form, a common element in these regions' success stories has been their ability to incorporate information into their business activities.

This chapter will contribute to the growing body of literature devoted to understanding the interplay between the economy and information. In addition to understanding the nature of information and the potential role that it can play in the economic transformation of local economies, this chapter will explore the forces that come to bear on companies as they grapple with the creation, distribution and application of information through network based business configurations (i.e., the industrial district).

SECTION 2: INFORMATION AS AN AGENT OF GROWTH IN THE NEW ECONOMY

The changing market today requires companies to be engaged in a perpetual process of innovation. Information is an important ingredient of the innovative process. Companies premised on hierarchical models can innovate but are limited by the absence of free flowing information and the succession of ideas that this flow can engender. It cannot be disputed that Ford introduced breakthroughs to both the car industry and to American business under his hierarchical systems, but as Best explains, his innovations were limited to structural changes (Best, p. 12). That is, he determined a way to drive down costs and once the innovation was put in place working practices became routinized. Alternately, as Best explains, within the new flexible environment, the

entrepreneurial firm needs to assume a central role, choose a strategic orientation and seek to establish its advantage on the basis of Schumpeterian innovation in both product and process organization (Schumpeterian innovation refers to product innovation and development). These changes are the result of social processes in which incremental changes are implemented. Information becomes this system's lifeblood. For entrepreneurial firms that operate within this new understanding and have the advantage of obtaining information from a number of sources (i.e., consumers, workers, suppliers, staff members, managers), the possibility for improvement is always imminent. This is because innovation is treated as a social process that requires the interrelation of people engaged in functionally distinct activities.

A 1985 UNESCO report entitled The New International Economic Order: Links between Economics and Communications discusses the role of information in a global economy. Focusing on the evolution and primacy of the transnational corporation, the study advances that,

as industrial production processes increase in complexity, the importance of information increases greatly. The manufacturing of simple products requires large amounts of labour force, material and manual skill, but relatively little information. This changes with the production of more complicated machinery, with information becoming increasingly significant in relation to labour and material. More and more production processes have in fact become information processes (UNESCO, p. 35)

The UNESCO report relies on the work undertaken by the OECD which concludes that international trade has been advanced as a result of the increased economic significance of information activities by stimulating trade, increasing international investment and spawning networks of technology transfers (UNESCO, p. 35). The pressures being exerted by the extremely segmented markets and the threat of

international competition are being compounded by the range of products available and competition from product and process innovation that traditional Fordist mechanisms and their focus on hierarchical structures cannot respond to. This has transpired because Fordist regimes of accumulation are characterized by hierarchical communication flows between the lead firm (purchaser) and the supplier firms (or in the large vertically integrated company between departments of a company). This undercuts a firm's capacity to integrate learning and doing into their daily routines and the potential for innovation is thwarted.

David Allen and Victor Levine undertook a study of Pennsylvania's development strategy for advanced technology industries. While their focus was the public policy rationale for government intervention in advanced technology industries, Allen and Levine recognized that new economic development efforts are markedly different from traditional manufacturing industries. They surmised that economic transformation and technological change occur in dynamic and complex environments. Their analysis recognized that today's management and government stimulates innovation by facilitating the flow of information (Allen and Levine, chapter 4). In particular in an examination of *innovation and diffusion theories* for development, they explain that, innovation is part of a process that is influenced by macroeconomic factors, and discrete firm linkages and transfers. They further clarify that, "innovation moves within or outside the organization and/or industry based on a flow of information and the use of innovations by other organizations (Allen and Levine, p. 66)." Similarly, in the case of *growth pole theories*, they remark that innovations continue as a result of interfirm and inter-industry linkages in the form of technological support organizations and other

infrastructures that maintain close communication between the involved parties (Allen and Levine, pp. 66-67). That is, regardless of the perspective on innovation that one subscribes to, a general consensus exists which maintains that the relations and communicatory acts that connect companies and businesses to one another sustain the innovative process.

Information is not only necessary in the innovative process; it is also a factor in the manufacturing process. While critical of the relations that the company has established with its supplier firms, Harrison points to Benetton as a company that successfully transports information between its business partners in the interests of responding to the demands of the market while appearing to maintain the internal cohesion of local economic units. Benetton uses a complex web of information systems to connect its eight factories and looms to one another and to the company's global market. Harrison explains that Benetton will

sell its products only to franchises (typically independently owned) that bear its name ... Each individual outlet is connected to regional and world headquarters, and to highly automated warehouses, through a sophisticated computer network. In this way, the company is able to continually receive up-to-the-minute information on which product designs, - and especially which *colors* - are selling in which markets, at what prices (Harrison, p. 91).

The speed at which Benetton shares information (thanks to innovations in bar coding) within its regionally situated plants means that it can respond to the changes in global demand almost instantaneously. Benetton has developed a system of just-in-time dying that allows the company to colour its clothing at the last stage of production and thereby keep its products consistent with the latest trends and consumer demands.

SECTION 3: THE BARRIERS

Failure to tap into the potential offered by information is due, at least in part, to systemic problems that include the restrictions of neoclassical economic theory, the limits of mass production and the elusive nature of information itself. Remnants of mass production and the necessarily debilitating competitive framework of neoclassical doctrine (in particular, equilibrium theory) make it difficult for policy makers and capital to engage alternative development structures and embark on new strategies for the future. The inability to incorporate information and the communication of information into the system has ultimately meant that opportunities have been lost.

In an examination of the interplay between communication and economics, Robert Babe lays out a plan of action for future economic development. He proposes an evolutionary economic theory wherein, “economics centered on communicatory considerations ... recover lost ground and progress toward a more sustainable, more just, more humane and democratic economic/communicatory order (Babe, p. 6).”

A) Information and Neoclassical Economic Theory—Problems of substance and form

Economic behaviour modeled to fit within the neoclassical framework fails to rise to the challenges being dealt to businesses in a flexible era. Neoclassical theory evolved during economic circumstances when successes were limited to big businesses that were responding to (or, more to the point, generating) the demands of mass markets. Today, mass market saturation has necessitated, and new technologies have once again made it possible to grow niche-market businesses. This thesis advances that niche market businesses can achieve economic success when they are situated within the borders of a local economic unit that specializes in a particular industry. Further, those areas that

have excelled have espoused an approach to the dissemination of information that ignores the confines of neoclassical logic. This section will demonstrate that the tools and logic of neoclassical development are counter-productive when applied to information and consequently circumvent the extension of capital and can derail the evolution of sound local economies.

Stripped of its arcane formulae and complex models, neoclassical economic theory is simply a function of supply and demand curves and a process “of commodity exchange, whereby goods and services possessed by one are traded for goods and services held by another. An exchange will occur when both parties benefit due to differences in valuations of the articles in question. (Babe, p. 14).” It is a system that is driven by an internal, and unwavering, logic of price competition and the expectation that external markets are also guided by the principles of price competition. Another central tenet of the theory is that a free market system spontaneously creates the efficient allocation of resources (Best, p. 127). Taken to its logical conclusion, its concentration on price competition and allocative efficiency circumvents economic actors from accommodating any activity that does not enhance the company’s competitive position in the marketplace. This precludes the flexibility that is necessary in today’s niche market economy. In addition, it casts aside social considerations that do not directly enhance the bottom line.

Besides the limited range of activity accommodated by the theory itself, part of the difficulty faced by information and its incorporation into neoclassical models for development stem from an inadequate understanding of what information is (Babe, 1995; p. 10). Following an exploration of four competing definitions of information, Robert

Babe summarizes that information involves an interaction between the source and recipient, it consists of symbols and signs to represent something and it is immaterial (Babe, 1995, p. 11-14). In addition to this fundamental definition of information, this thesis also acknowledges that information is “already existing knowledge” and that the capacity to extend and develop existing knowledge through processes of problem solving is the crux of the entrepreneurial firm that was discussed in chapter one (Best, p. 13). It is worth repeating that under past production regimes, it was sufficient to increase one’s throughput through innovation in processes; however, the current milieu requires Schumpeterian innovation (product and process innovation and development).

In addition to understanding what information is, it is also important to try to situate it in one of the broad-brush categories of market, private or public. The market is the place where economic exchanges of surplus value occur, the private environment is the site of intimate and interpersonal relations and the public is the arena where democracy becomes manifest (Mosco, p. 169-170).

The delineation between public, private and market is inadequate when discussing information because information in fact straddles these three dimensions. In order to escape the conundrum of defining the “public sphere”, Vincent Mosco suggests that it should be approached as “a set of social processes that carry out democracy, namely advancing equality and the fullest possible participation in the complete range of economic, political, social and cultural decision making (Mosco, 1996, p. 170).” In this regard, information falls within the public sphere because it is a piston of the economic engine that is required for the sound evolution of a democratic society.

In an analysis of the possibilities for economic transformation in The New Competition, Michael Best draws on the equilibrium theories of R. H. Coase, Alfred Marshall and Oliver Williamson who reduce the firm and individual actors to automatons who are driven by the utility assumption of *homo economicus*. The language of neoclassical economic theory and equilibrium theory do not grasp the qualities embedded in information and the emancipatory role that it can play in a world where economic success is based on a company's ability to innovate and rise to the challenges of the flexible era. In particular, "the neoclassical assumption that eventually the firm with the lowest cost production methods will dominate in the marketplace, does not account for the increased relevance of the capacity to compete on the basis of product, process, and response time (Best, p. 14)."

The language of mainstream economic thought is restricted by the self-imposed bounds of inputs and outputs. Babe maintains that attempts to situate information as either an economic input or output are ill founded because they deny the evanescent characteristics of information—i.e., its transformative properties. Inputs and outputs are traditionally considered those entities that can be defined by time and space and be quantified for the purpose of monetary exchange. However, the will of active economic agents places information in a cycle of reinvention and the categories of input and output bypass information's tendency toward perpetual change. Throughout this analysis it is important to bear in mind that the transformative nature of information means that outputs only exist for a brief moment before they become inputs in another process of change. That is, inputs and outputs are simply two sides of the same coin—i.e., refined sugar is the output of sugar cane, but the input for the production of confectioneries.

Robert Babe explains that information cannot be treated as an economic input because it is “not merely an input or factor of production substitutable for other factors of production like land, labour, or capital. Information rather defines, permeates, and transforms other inputs and indeed entire production processes (Babe, p. 15).” In particular, information is part of an accretive process wherein additional information can change all subsequent economic actions and shape the final product. That is, information is a process within a production schema where outcomes cannot be anticipated. While businesses and researchers ultimately pursue the development of a particular product/outcome, the capacity for a particular piece of information to advance their project cannot be determined before the process is completed.

This reality makes it impracticable to fix a monetary cost to information and consequently impossible for it to be incorporated into the production schema of a business plan premised on the assumptions of neoclassical theory. As explained above, within neoclassical theory, inputs’ values are based on their marginal contributions to final products and the decision to dedicate resources to their acquisition is based on their ability to enhance the bottom line. However the peculiar active property of information means that its relative contribution to the bottom line cannot be determined until it is applied. The neoclassical framework is ill suited to the task of accommodating unknown outcomes due to its reductionalist and limited approach to assigning price on the sole basis of exchange value. Benjamin Bates explains that the inability to pre-determine a value for information often makes it difficult for most companies to incorporate it into their business plans. He emphasizes that because the value of information cannot be determined until it is used, information runs the risk of being underused or applied

inefficiently (he argues that this means the social ancillary values of information will not be realized and its full social and economic benefits are not likely to materialize). This places neoclassical economic theory in a state of crisis concerning its own internal validity (Babe, p. 28) and stands in the way of economic progress in today's economy.

The recognition that production in today's environment is an accretive process also means that information will yield different outcomes in different contexts. Information cannot be introduced to a business process as if it were being released into a vacuum. It must account for the unique combination of factors that coalesce within the confines of a firm. That is, the exact same information can yield dissimilar results or be used in different ways in each circumstance that it is introduced into. Edith Penrose theorizes the firm as a collectivity where "men <sic> have become used to working in a particular firm or with a particular group of other men, they become individually and as a group more valuable to the firm in that the services they can render are enhanced by their knowledge of their fellow-workers, or of the methods of the firm, and to the best way of doing things in the particular circumstances in which they are working (Penrose, 1959, p. 52 (quoted in Best, p. 126))." Neoclassical economic theory cannot account for these differences.

An important component of Penrose's theory is its distinction between experiential knowledge and objective knowledge. Similar to Best who champions the learning firm and its ability to engage in problem solving to extend knowledge, Penrose's theory emphasizes the importance of experience. Objective knowledge is that which can be transmitted to all participants on equal terms (i.e., a blueprint that anyone can have access to and understand on equal terms or a database of Fortune 500 Companies). Alternately, experiential knowledge is embedded in habit, skill, routine, practices or teamwork and

cannot be transmitted by similar means (Best; p. 127). It is the process of changing information into knowledge/solutions that is important to the final economic product and not necessarily the components of information that go into it (i.e., having the capacity to execute a blueprint or the ability to use the database of Fortune 500 companies to generate business leads). But more importantly, without experiential knowledge, the potential to translate objective knowledge into an innovation is thwarted. This dichotomy turns economic models on their heads. While experiential knowledge has implicit value, it cannot be traded or for that matter accounted for through the traditional business praxis of neoclassical theory. The difficulty of affixing a monetary value to information is intensified because of experiential knowledge. That is, labourers have the capacity to interpret and apply information differently from one another based on their personal war chest of experiential knowledge. Specifically, how can one determine a price point for information based on the variable capacity of its different companies to engage the entity? Relying on Penrose's theory of the firm, Michael Best explains that "the productivity of resources depends, in part, on each firm's specific culture. Consequently, the neoclassical notion of a marginal product to a single factor, independent of use, makes no sense. The marginal value of a product is firm specific; it is affected by the unique combination of services with the firm in which it is employed (Best, p. 126)." That is, price (the quintessential hallmark of neoclassical theory) is an imperfect means of determining the allocation of products in the marketplace.

In addition, the fact that information can be used more than once exacerbates the dilemma of affixing a monetary value to information. Unlike a commodity such as lumber, once information is applied it continues to exist and can be applied again and

again. Babe explains that information is “never a final output, consumed and thereby annihilated. Rather, it is ingested by the receiver and thereby altered (Babe, p. 17).” Indeed, not only does the initial piece of information continue to exist, but also, it is augmented by virtue of the user’s contact with it.

Babe also maintains that information cannot be treated as an economic output or as a commodity because information itself is intangible. Confusion arises because, “in practice, the measures employed pertain to the material or physical means of encapsulating information—the number of pages, number of words, bits (Babe, p. 16)” — rather than to the information itself. Similarly, in an analysis of information’s potential contributions to social welfare, Bates explains that the inappropriate focus on the physical manifestations of information keeps analysts from appreciating the full social and economic reach of information. For example, the relative scientific contribution of the equation $e=mc^2$ compared to the 1,500 page journal of an individual who failed in an attempt to mate two stuffed animals cannot be determined based on the amount of paper that each occupies (although the 1,500 page journal may detail a wealth of information about a culture, afford the reader with hours of pleasurable reading or even provide the building blocks for uncovering the basis of a complex neurosis). Bates specifies that information’s “value is created through the use of information which is not considered by traditional economic models (Bates, p. 84).” Babe echoes this sentiment; he argues that, “the inability to devise a measure for information means ultimately, that information stands outside neoclassical modeling (Babe, p. 38).”

The proposition that information should be treated as a commodity comes with additional cautionary tales. “It means that the suppliers and producers of information

need value the same only in terms of market price, outside of any ethical or moral framework (Babe, p. 18).” This places businesses in a unique quandary as someone may recognize the need and the benefits of a more egalitarian distribution of information, but it is not undertaken because they cannot find a supplier who has ‘priced’ information to accommodate their objectives. They lack the language, protocols and tools to proceed with the aforementioned information exchange.

This is not to suggest that there have not been attempts to inject information into the processes of economic development or that certain communities have not efficiently incorporated information into their schema. However, driven by the restrictive logic of neoclassical theory, information is typically mutated and either underused or inefficiently applied in economic exchanges.

The transformative properties of information make it impractical to attach a price tag to information and consequently place information outside the confines of neoclassical theory that is bound by the language of price competition and the employment of inputs and outputs. Neoclassical economic theory is thrown into a state of crisis due to its inability to deal with information’s unique properties. Neoclassical theory must be shunted aside in order to make way for a communicatory order that can accommodate information and allow it to transform economic activities in the spirit of the flexible demands that have permeated business today.

B) Mass Production and the Emergence of Flexible Specialization

As explained in chapter one, prior to the current crisis in production systems, North America was on an economic trajectory governed by the logic of mass production.

Characterized by the pursuit of economies of scale and ruled by the laws of return companies sought to achieve a competitive advantage based on price (principles of neoclassical economic theory). By and large, the economy grew, people accumulated capital and partook in the luxuries that the times afforded. According to both Piore and Sabel's and Best's historical analyses of industrial progress, the seeds of today's economic woes were sown during these triumphant days of American enterprise (Piore and Sabel, 1984; Best, 1990). They trace the problem to the fact that flexible production was relegated to a secondary role and mass production was adopted as the economic orthodoxy of the day. The very constitution of a mass production system is flawed because it can only be sustained in the unlikely scenario where markets are big enough to absorb the enormous output generated by the system and stable enough to keep resources (labour and capital investments) continually employed. In spite of these flaws, the system endured because of the power wielded by capital and political decision-makers (through the application of policies that stabilized demand). Consequently, the system grew bloated, inefficient, unresponsive to market pressures and, alarmingly, emerged as the economic standard of the day. This decision led to the evolution of large and technically austere companies (employing Fordist and Taylorist principles of production) that existed in isolation of one another.

The standardized nature of the mass production system meant that communication between firms and across the different phases of production was neither necessary nor desirable. In fact, during mass production, knowledge and skills were embedded in the machinery. In particular, Taylorist and Fordist principles of production isolated both firms and individual workers from one another, their markets and in fact from the very

work that they were carrying out. During the period of mass production and the supremacy of large-scale American enterprise, there was a disconnect between planning and doing (Best, p. 134) and information failed to flow throughout the different stages of production. Best explains that, “the industrial enterprises of Ford and Carnegie were not organized to promote learning throughout the organization, to integrate thinking and doing within production, or to promote teamwork across functional activities for the purposes of design refinement or new product development (Best, p. 14).” Under mass production there was little need for information as all systems were controlled centrally.

According to Piore and Sabel’s analysis, the possibility for the re-emergence of craft production as a dominant model for economic development has once again become a possibility. Analysts such as Michael Best are more modest about the fate of the mass production system and the strength of those who have a vested interest in its preservation. Best posits that flexible specialization will emerge as an alternative within a range of other possibilities in what he has termed the New Competition. Best explains that entrepreneurial firms will drive success in the current environment because they will “gain strategic advantage by continuous improvement in process and product (Best, p. 12).”

In order for the entrepreneurial firm to make the incremental changes that are necessary, it must have organizational flexibility at the level of micro production. To facilitate continuity in a hierarchical firm, the organization of production is divided into such small components that the individual’s capacity to reflect and think about what he/she is engaged in is absent. Conversely, the success of the entrepreneurial firm is contingent upon the possibility for individuals to interact and discuss their jobs in order to

continually innovate and meet the needs of the evolving marketplace. “The new ‘thoughtware economy’ as Birch calls it relies upon innovation—the process of using resources in new ways to generate new goods and services (Allen and Levine, p. 215).”

To accomplish this, companies can try to develop a better grasp of information. The elusive nature of information in conjunction with the limits of mass production and neo-classical economic theory have precluded the optimal use of information and consequently curbed the possibility for flexible models of development and the industrial district model of production to emerge as a dominant economic option.

A central principle in the mass production system and one that belies the principles of neo-classical economic theory is the product life cycle. In the traditional product life-cycle model, “new products and industries are born in the most sophisticated and technologically advanced economies, and then diffuse to less advanced and lower cost settings as the products and production processes become standardized and hence easier to master and transfer (Sabel, p. 231).” Under this model, the hierarchically structured firm is driven to minimize production costs by achieving continuity in production operations, product runs and product designs. This limited approach to business has circumvented the possibility for concepts such as strategy, production, management and organization, culture and regulation to enter the language of mainstream economic development and consequently ignored the potential offered by information.

The current crossroad that capital must broach defies the logic of the product life-cycle model because of an increased demand for non-standardized goods and a breakdown of the regulatory apparatus that has traditionally upheld the mass production

system. In today's economy, "responding to changing market demands means being able to supply consumers with a newly designed product; it will involve refinements in production methods and technologies. In each of these cases success depends not upon being the lowest cost (or highest throughput) producer, but upon the minimization of product development and product changeover times (Best, p. 14)." David Harvey explains that, "the economies of scale sought under Fordist mass production have, it seems, been countered by an increasing capacity to manufacture a variety of goods cheaply in small batches. Economies of scope have beaten out economies of scale (Harvey, p. 155)." These changes are coupled with an overhaul of the manufacturing processes whereby non-specialists and flexible manufacturing technologies have emerged that have the capacity to radically alter the possibilities for industrial development. In tracing the devolution of the industrial district model, Andrew, Houle and Thieriault explain the change that has occurred. They specify that, "instead of the traditional hierarchical patterns, communications and interdependencies develop on a lateral basis (Andrew et. al, p. 331)."

In response to the lack of cogency of the product life cycle model, Charles Sabel explains that sound regional economies can evolve by concentrating on what he refers to as the extended service model. The extended service model takes the form of mutual aid societies, interfirm organizations and guilds. Each of these makes the necessary inputs for production more accessible thereby allowing an area to both produce and improve a product. Exalting the benefits of this system, in a study on Pennsylvania's high technology sector and accompanying policy apparatus, analysts Allen and Levine remark that, "regions can grow and diversify if they promote entrepreneurship and change their

role from recipients of innovation via branch plants to generators of innovation through indigenous growth (Allen et al., p. 68).”

Within C.T.T., companies have responded to the global demand for non-standardized products. While not a conscientious rejection of the principles of neoclassical doctrine, the nature of C.T.T.’s high technology businesses certainly run contrary to the logic of conventional wisdom and for the most part is driven by niche markets as opposed to mass markets (there are a number of companies in C.T.T. that continue to supply standardized products to mass markets). Companies within C.T.T. establish a competitive advantage on the basis of innovative products that are designed for specific niche markets rather than an advantage premised on economies of scale and broad market applications. That is, they have assumed a position outside the logic of mass production. Consequently, companies are not driven to reduce production costs or to outsource the final stages of production to cheap peripheral labour markets (most companies either sell directly to their end-market themselves or are part of the local supplier system). The recognition that the region’s strength is part and parcel of its ability to innovate has necessitated that strict market valuations of inputs for production be cast aside in exchange for a framework where the focus is on supporting an innovative and creative region.

C) Conclusion: The Duality of Capitalism and the Duality of Information

Robert Babe offers a solution to the conundrum that business is faced with, whereby information is increasingly becoming a necessary cog on the innovation wheel, but cannot be accommodated by the tools and apparatus of traditional business. He proposes that, “a more promising approach would be to stop ‘force-fitting’ information into the commodity mode and indeed to reverse the process, treating information no longer as

commodity, but rather addressing “commodities” as being informational and communicatory (Babe, p. 39).” He concludes that

Mainstream economics, premised as it is on the ubiquity of commodity exchange, needs to treat information as commodity to account for information within the mainstream or orthodox paradigm. Information, however, does not fulfill the definitional or conceptual requirements of commodity, thereby placing the discipline in a crisis concerning its own internal validity. Moreover, insisting that information is commodity obscures not only many essential properties of information, but as well consequences of information exchanging, creating thereby also a crisis of external validity (Babe, 1995; p. 28).

He recommends that information be treated as *essence* to “emphasize the dynamic transformative effect of information with respect to whatever it comes into contact with (Babe, 1995; p. 17).” This definition would also help sustain and advance the extended service model and contribute to the decline of the mass production system.

In order to accomplish this, there is a need to break with the doctrine of price and embrace a more comprehensive analysis of economic behaviour. In keeping with the principles adopted by the industrial districts that were discussed in chapter one, a heterodox approach to economics can be used to ensure that the future is not bound by the limits of past failures. As discussed in chapter one, an evolutionary approach to economic development can allow one to tap into the potential offered by information and consequently usher in a new phase in capitalism’s history. Evolutionary economics is based on the behavioural theory of the firm, its focus is on decisions, rules, learning capabilities and adaptive behaviour, and the interactions between these behaviours and various economic selection mechanisms. According to J.S. Metcalfe, it involves a “... shift from perceiving competition in terms of price to viewing competition in terms of those decisive cost and quality advantages which arise from innovative behaviour. It

entails a shift from competition in terms of states of equilibrium characterized by different market structures, to competition as a process of change premised on the existence of the differential behaviour of firms and other economic agents. (Metcalf, p. 27/28).” This refreshed approach to economics makes it possible, and in fact necessary, for information to assume a more prominent role in economic models. It becomes the bridge to innovation and enhances the possibilities offered by the extended service model of development.

Robert Babe’s information as essence thesis contributes greatly to the conceptual understanding of information. It presents a strong case for abandoning the economic orthodoxy of the day in exchange for a renewed approach to information. However, while he injects power relations into the debate throughout his analysis, the notion that information is essence is in itself void of power and consequently falls short when subjected to closer scrutiny. To understand information as essence is to appreciate its transformative properties and the role that it can assume in a system that is driven by an internal motivation to innovate and develop, but ignores the practical limits of such an understanding. Within the evolutionary framework that Babe explores in the rest of his analysis, individual actors and firms actively pursue different products and consequently determine what information will be used, how it will be shared and ultimately, shape information as it simultaneously shapes them and their projects. That is, information is not an ephemeral entity and the label *essence* falls short of capturing the range of functions that it performs and the extent to which economic agents actively shape it.

Bearing in mind the realities that Babe exposed, one must recognize that a central tension within contemporary capitalism is that information can be BOTH a commodity

and a unique instrument of economic growth (i.e., it is an agent in the commodification process). We are breaking away from a world where information is embedded within machinery to one where information is both a value added as well as an actual tool of development. In an analysis of the changing face of labour in the modern economy, the Micro-Economic Policy Analysis Branch of Industry Canada acknowledged that information (knowledge) is a bi-faceted entity. They explain that,

There is a growing consensus among academics and policy-makers that most industrialized economies are increasingly becoming “knowledge-based”. Knowledge, both as input and an output, is seen as a key source of long-term growth and job creation. Recent evidence shows that the Canadian economy is dynamic and increasingly becoming innovative—i.e., knowledge-based, technology-intensive, and skill intensive (Gera et al., 1996, p. 1).

It is those regions that can successfully marry the two faces of information that will find economic success in the new flexible environment.

Within the network-based industrial system advocated throughout this thesis, the commodity form of information becomes manifest at different junctures in the production process. Information exchange is a dynamic and ongoing process. In this vein, Vincent Mosco maintains that the difference between information and steel, per se, is increasingly becoming a difference of degree rather than kind. He offers that,

information is valued as a commodity, as a product that is produced and distributed in markets by individuals acting in institutions with the power to structure the marketplace. More generally, information is a control commodity, a marketable product valued for its ability to produce wealth and to control people and institutions. The application of information processing and distribution systems (essentially the means of communication) has deepened and extended the ability to package and repackage, to measure and monitor information transactions, so that information can now take on the characteristics of a commodity. Put simply, thanks to developments in measurement, packaging and transaction monitoring, we know what the information commodity looks like, and when it has been exchanged and consumed (Mosco, 1992; p. 46).

However, to end the discussion of information at this point is to ignore its unique role in economic development. In terms of its transformative properties, Vincent Mosco further explains that “no commodity, including steel, cardboard boxes, and databases, fits the category of commodity perfectly. The point is not whether information is always and everywhere a commodity, but rather, as I argue, that it is increasingly useful to understand its social place by starting with the tendency to commodification (Mosco (1992), p. 46).” In a subsequent analysis of the underlying production system that gives shape to the commodity form, Mosco expands this notion and explains that it is the process of turning use values into exchange values (Mosco, 1996; chapter 4).

Communities that have successfully broken down the barriers to information exchange and learned to appreciate its transformative effects continue to operate within a capitalist framework of commodity exchange; but it is a capitalism that is not restricted to elements that can be reduced to price.

SECTION 3: NETWORKS AND NETWORKING—A COOPERATIVE FRAMEWORK

Having established the importance of information in the previous sections, the discussion must now focus on the means by which information is communicated between different economic agents and the conditions that must be met to ensure that it is used

effectively. The thesis will now turn to the relationships between companies and study their cooperative pursuits. From a theoretical perspective, it will investigate the growth of a cooperative business ethos, the dichotomy of private and public goods and the use and development of collaborative business services.

Anna Lee Saxenian's study of regional patterns of development explains that Route 128 did not realize its full economic potential because it failed to create networks to facilitate communications across and within firms and to harness the potential offered by information. Saxenian does not overstate this point. She recognizes that Route 128 continues to develop and generate technological breakthroughs; however, she is emphatic that the players are mired by an inability to recognize that "regional networks promote the collective technological advance that is increasingly essential to competitive success and long-term growth (Saxenian, p. 9)."

Michael Best points out that independent companies premised on hierarchical communication and production models can be innovative, just not in the same manner that is required in today's environment. One need not look beyond the gains made by Ford to recognize that breakthroughs in both the car industry and in American big business were possible under his system. However, his innovation was limited to structural change (Best, p. 12). That is, he determined a way to drive down costs and once the innovation was put in place working practices became routinized. Alternately, as Best explains, within the new flexible environment, the entrepreneurial firm must assume a central role. As it has been emphasized throughout this thesis, the entrepreneurial firm must choose a strategic orientation and seek to establish its advantage on the basis of Schumpeterian innovation in product and process organization.

These changes are not characterized by an overhaul of an entire way of conducting business, but are the result of social processes in which incremental changes are implemented. Information is the lifeblood.

In 1993, the CEO of Stentor Telecom Policy Inc., Jocelyne Cote-O'Hara, made a speech to the Canadian Centre for Management Development, where she recognized the importance of cooperation to success in today's business environment. She explained that "global changes driven by information and communication technology make government and private sector co-operation more urgent, but also provide more opportunities for cooperation (Cote-O'Hara, p. 33)." Her particular brand of cooperation necessitates the involvement of government and the establishment of institutional measures to facilitate cooperation. She believes that globalization necessitates interdependence and that the system is in fact predisposed to interfirm and institution cooperation.

In describing the evolution of the small firm in Emilia Romagna, Brusco highlights the particular kind of cooperation that exists in industrial districts. He explains that the primary type of cooperation found in industrial districts is between firms engaged in different activities. That is, "there is cooperation of a type that seeks economies of scale in particular activities (Brusco, p. 15)." Alternately, competition continues to exist among those firms that are pursuing the same activity. However, a firm's role within a district is so fluid that while they may cooperate with a company in one instance, they may find themselves competing with them in the near future.

According to Saxenian, regions such as Silicon Valley, where businesses have recognized the need for interrelations and developed strong networks with one another and with institutions, have met success. Similarly, in C.T.T., local government agencies, an entrepreneurial esprit and local businesses have been able to focus on niche-market businesses and act as a collective entrepreneur. They have ignored the strict boundaries that exist between companies and within firms. Along with a dense supplier network, the communities have a range of institutional and informal resource and support services that promote cross fertilization of industry and the independent growth of capital. These resources have grown from the recognition that by coming together and relying on their individual strengths, the companies that comprise C.T.T. can reap the international rewards of their collective experiences.

Without cooperation and trust, individuals would refrain from imparting information to other companies because they would be overly concerned about it having a deleterious effect on their own companies. The prototypical business ethos is guided by self interest and price competition and consequently undermines the ability for individuals to cooperate with one another. However, understanding business activity in terms of a cooperative esprit will help businesses prosper in today's economic environment. This section will be devoted to investigating the competing faces of a cooperative regime and the different factors that come to bear on companies as they grapple with the different elements of a cooperative precept.

Michael Best explains that cooperation has been traditionally denounced in the United States because it has been perceived as collusive and consequently running against the public interest (Best, p. 201). Some analysts (Best, Harrison, Piore and Sabel) have

concluded that unbridled competition inhibits innovation and consequently undermines a company's ability to compete in international markets. Competition is in fact a component of older regimes of accumulation and must be relegated to the sidelines in order for companies and regions to succeed in the new flexible environment. Reflecting on the high technology businesses in Pennsylvania, Allen and Levine remark that "interorganizational linkages occur because the complexities of advanced technology environments dictate sophisticated responses that cannot be handled by small, medium or even many large organizations (Allen and Levine, p. 17)." The make up of a cooperative business structure has many faces that can have far reaching consequences for the long-term success of an economic unit.

Bennett Harrison presents a vision for cooperation where companies exploit the constraints of time and space to achieve a network wherein suppliers and large firms establish "obligational contracting" targeted at coordinating the different stages of production and establishing and maintaining market share. In a similar way, a cooperative network guides Michael Best's vision for the future wherein the region can act as a "collective entrepreneur".

Harrison holds that lean production (based on reducing internal functions to a minimum, outsourcing and the exploiting of spatial relations) is a competitive and yet cooperative strategy that can be implemented by big business to excel in the new flexible environment. He heralds the Japanese kereitsu as the embodiment of these principles. Harrison explains that the kereitsu is driven by what he calls 'the habit of cooperation'. The kereitsu allows "concentrated economic power <to> be reconciled with decentralized, cross-border production in ways that promote organization learning,

system wide innovation, and most of all—flexibility in the face of competitive pressures (Harrison, p. 151).”

The intermarket kereitsu is premised on the “one set principle” which entails that each horizontally structured network includes a company from each major division of industry, a lead bank, a foreign trading company and be connected to all of the important government ministries. The supply kereitsu is premised on the principle that large corporations emerge and develop a network of suppliers and affiliates around them. He explains that Toyota, Sony and NEC are part of a supply kereitsu. The supply kereitsu has come to epitomize industrial relations in Japan. It is important to realize that the supply and intermarket kereitsu do not exist independently, but are interconnected, as a supply kereitsu is part of a larger intermarket kereitsu.

Ultimately, he defines a successful economic network as one in which its ‘members’ cooperate by maintaining a willingness to commit to long range plans and well-thought out strategic alliances that are neither coincidental nor based on self interest. The downside of this type of arrangement is that the economy is susceptible to the proliferation of precarious work patterns and can widen the gap between the rich and the poor. Upon closer analysis, it can be argued that these systems simply displace the risk of doing business in today’s fickle marketplace to smaller companies who are dispensable and whose success or failure will not affect the lead company. The individual small companies do not have the capacity to either stake out an independent course of action nor do they possess enough substantive influence within the kereitsu to shape internal decisions. While the kereitsu model can be comprised of non-hierarchical firms engaged in innovative behaviour, its structure is not predisposed to yield those advantages traced

in the learning firm. Instead, it has the characteristics of a hierarchical firm dispersed across many companies.

While Michael Best recognizes the successes that have materialized under this system, he rejects it as a basis for sustaining future economic successes because it is premised on large firms that he believes embody inequitable and unstable relations. Alternately, he suggests a cooperative framework wherein independent small firms achieve an economic advantage without the involvement of a lead firm. In part, he relies on the example of Emilia Romagna as a centre of growth to illustrate his vision. He proposes that Emilia Romagna is qualitatively different from the Japanese model. Best explains that Emilia Romagna is an example of a region where business cooperate with one another in the interests of competing internationally and achieving high standards of living without the wholesale importation of corporate giants. Also, in the case of Modena in the Third Italy, the district's pursuits are coordinated by the government and highly efficient interfirm organizations such as the National Congress of Artisans (NCA) -- that is incidentally one of the first postwar interfirm institution. Within Best's theory, the primary motivation for interfirm cooperation resides in both local government and the entrepreneurial firm and their desires to enhance the economic prowess of the region as a whole. Best explains that in the interests of transcending private pursuits in the name of the common good, "local government has been able to pursue an aggressive economic program and retain a degree of insulation from interest group politics by creating a range of extra- and inter-firm institutions (Best, p. 209)." The importance of working together becomes a cornerstone to success in the international market (Best, p. 21). Artisan

associations have played a pivotal role in the evolution of the area's economic prosperity because they provide collective services to its membership.

Jonathan Zeitlin echoes this sentiment. In an examination of the conditions required to sustain growth in industrial districts, he explains that successful regional projects require "a set of collective institutions to sustain the innovative recombination of resources by balancing cooperation and competition among productive units (Zeitlin, p. 285)." In the Third Italy, artisan firms are characteristically small, have an average of three employees, are associated with the communist or socialist parties, the owner is a working manager and typically, at least one other member of the firm is a member of the same family. The primary distinction between an artisan association and a lead firm such as Benetton, which would provide many of the same services, is that Benetton can relocate and abandon its peripheral small firms. An artisan association will not do this because it is bound to the collective interest of a number of firms and not the individual whim of a large multinational corporation. Within the Third Italy, artisan associations are bound by Leftist principles, the internal cohesion of its membership, roots in the community and recognition that their own successes will only be limited by the failures of the association.

The artisan groups found in Emilia Romagna embody the relations of a cooperative framework. The associations provide collective services and help a firm establish itself locally in order that it can compete effectively in the international market. The largest interfirm productive association in Italy is the Confederazione Nazionale dell'Artigianato (CNA) which boasts 340,000 member firms, a staff of 7,000 and 2,300 offices throughout the country (Hatch, 1986, p. 14 in Best, p. 209). The services offered by the CNA exceed

those offered by associations found throughout North America and other parts of the world. It is an amalgam of a typical trade association and governmental agency.

Beyond lobbying government, the range of activities that are undertaken by the CNA are primarily those for which economies of scale exist. In particular, Best itemizes the following collection of services,

- Accounting services
- Financial services
- Assistance in the development of property facilities (i.e., industrial parks)
- Assistance in the creation of business service centres (i.e., real-resource sector-specific centres)
- Assistance in the development of cooperatives directed at the general problems faced by a group of firms (i.e., quality control and export marketing)

Best remarks that these types of services allow “member firms to cooperate in the provision of collective services while remaining autonomous in areas of decision making and finances (Best, p. 211).” In addition, this thesis asserts that participation in these services breeds a sense of goodwill that ultimately contributes to the growth of businesses.

Another difference between a system based on Harrison’s quasi-cooperative/obligational contracting and the cooperative framework of Best is the source of motivation. In Harrison’s framework, the primary motivation remains economic success within a capitalist world—although it is bound by *obligational contracting*. The firms in this framework are engaged in a relationship that advances the business of one of its peripheral suppliers at the expense of another in an effort to maintain and in fact propel its own internal efficiency and overall competitive position. Further, the very

structure of the enterprise makes it possible for the large corporation to choose to abandon an area on the basis of its own competitive position in the international marketplace. Conversely, within Best's cooperative industrial district, the individual small firms are part of a larger commitment to each other and they recognize that their individual successes are bound to the successes of their neighbours. The artisan associations are cohesive as a result of the commitment of individual membership firms and the government. This cooperation is based on a more stable footing than that advanced by Harrison.

In order for a cooperative framework to become manifest, trust must be present. The relations operate outside the traditional confines of a market. Zeitlin contributes that, the importance of cooperation, trust and community have been instrumental to the economic success of industrial districts.

An alternative to market coordination between bankers and firms was required if small firms were to be entrepreneurial in the sense of investing in new products and processes, i.e., in the Schumpeterian sense. The challenge of economical provision of entrepreneurial information was met in the Third Italy by institution building. The information existed, but the market was (and is) inherently inefficient in providing the one ingredient required to obtain it, namely trust (Best, p. 215).

The scenario of the Third Italy has been described as a combination of social economic and historical realities that are unique to the area and therefore cannot be reproduced. However, Charles Sabel maintains that under the proper circumstances, any shared experience can provide the basis for social embedding and the cultivation of trust and cooperation. In an article entitled, "Studied Trust: Building New Forms of Cooperation in a Volatile Economy", Sabel argues that trust is a precondition of social life and explains how persons or relations come to be seen as trustworthy. Sabel

maintains that the possibility for replicating industrial districts is found within society itself. Based on a belief that individuals are constituted in society, he advances that the premise for individual behaviour is defined by the common stock of customs and traditions that exist within a community (Sabel; 1992, p. 220). I will refer to this as the *Oz Effect* (just as Dorothy always had the capacity to return to Kansas in The Wizard of Oz, so too do economic agents have the wherewithall to develop sound industrial districts). Charles Sabel explains that, “so long as social life is possible, the realm of trusting behaviour can always in principle be enlarged by extending to new realms the shared understanding which make sociability possible in the first place (Sabel; 1992, p. 221).” He further proposes the notion of reconciliation and genesis amnesia (the politics of trust) whereby trust depends on how individuals reinterpret their collective past and conflicts in order that trusting cooperation is seen as something natural or unnatural. According to this theory, societies collectively reinterpret their own histories to make trust seem inevitable. He also elucidates the notion of studied consensus (or learning to cooperate) wherein groups are able to redefine community interests (NB: These principles will be given further consideration in chapter four).

Other studies have also discovered that a common cultural heritage is not a precondition to the trust that propels success in industrial districts (Zeitlin, p. 286). Zeitlin cites the existence of common backgrounds, craft pride, common professional identity as well as ties to ethnicity, religion or political affiliation as providing the bases to build a minimum level of trust.

Authors who have studied the flow of information within network structures are concerned that intellectual property issues will circumvent the possibility for cooperation

and development. For example, both Bennett Harrison and Michael Best warn of the 'free ride' and the potential for firms operating in a cooperative environment to take advantage of the information that other firms have invested time and resources into developing. Harrison points to lawsuits in Silicon Valley dealing with intellectual property issues. But, according to Anna Lee Saxenian's more detailed analysis, these are the exception and not the rule of business in Silicon Valley. Harrison also explains that in Prato, government subsidized computer technology designed to enhance cooperation and reassert the region's previous economic prowess are not being used for fear that information may be stolen. These two examples reflect a lack of strong social embedding and unwillingness to develop as a collective entrepreneur. "Trust" becomes a critical point in interfirm relations. In The New Competition, Best shares an optimistic view on the future of information sharing. He explains that in the Third Italy, information is treated as a 'public good' and is available for the advancement of the region as a whole (Best, p. 219). Based on the premise that "information is a public good that will generally be under supplied in the market (Best, p. 219) and increasingly important in the era of the New Competition, Michael Best explains that in the Third Italy, centres that facilitate the provision of information have been created. In keeping with the Schumpeterian philosophy of innovation that motivates the region and the entrepreneurial firms, it is only by neglecting price competition and sharing information at the local level that the firms can be competitive in the international market (as a result of innovation). Without the free flow and sharing of information, innovation for the entrepreneurial firm would be almost impossible.

To the extent that product and process innovation is based upon new ideas and that the creation of ideas is a social process involving discussion, then geographical proximity is important in innovation. The idea of coordination by cooperation as distinct from coordination by market is that the purpose of coordination is not simply efficiency, but innovation (Best, p. 236).

There is a concomitant emphasis on design and specialty niches as opposed to wage/price competition.

Saxenian also points to the informal socializing where bars have achieved a quasi-institutional role in economic development. She remarks that the Wagon Wheel bar in Mountain View has been termed 'the fountainhead of the semiconductor industry' (Saxenian, p. 32). While the social embedding and networking that these meetings depended on will be explored in chapter three, it is important to recognize that information was freely shared in these settings. Saxenian explains that, "these informal conversations were pervasive and served as an important source of up-to-date information about competitors, customers, markets and technologies. (Saxenian, p. 33)." She attributes the successes of the regions to the successes of the areas and their abilities to share information with one another.

SECTION 4: CONCLUSION

An article published in The Canadian Journal of Information Science entitled "Partnerships in Information Service Design" (April 1991) demonstrates the difficulty faced by information in today's environment. The author discusses the commercial development of two new products designed to impart information to Canadian businesses. The author cites the commercial demand for these services and explains that "information needs to be packaged as a product for it to be a recognizable commodity with value (Carie, p. 47)." While such endeavours may be financially successful for the

information broker, they may fail to incite innovation and can have the adverse affect of deterring development. The author's proposed product will actually advance the deepening of capital through the exploitation of information as a corporate commodity that negates the social and economic benefits that might ensue from a more egalitarian application of information.

This calls to mind the parable of the *tragedy of the commons* (as recounted in Best). In this parable, the commons is a public grazing space that is destroyed because citizens who grazed their livestock in the common did not follow the rules that were set up to ensure that it could be sustained and enhanced (in particular, they overgrazed the land). Those who allowed their livestock to overgraze ultimately destroyed both the common as well as the collective sentiment that created the communal grazing area in the first place. While driven by enlightened self-interest, individual members of the community who abided by the rules suffered the loss of the common area because of the unbridled self-interest of those who chose to overgraze. This marked the beginnings of a vicious cycle wherein the enlightened grazers will abandon their resolve to act in the collective interest of the community and overgraze the common in an effort to safeguard themselves from those who might abuse the space. At the end of the day, all members of the collective ultimately contributed to the erosion of the common and the dilapidation of the communal spirit.

The commercialization of information discussed in The Canadian Journal of Information Science article is akin to the degradation of the common space. Information is the fodder of success in the new flexible environment. It is the joint stock of business

expertise, technical ingenuity and goodwill that facilitates the development of innovative products that will help the community gain international notoriety.

It has been argued that, “communications and communications technology are perceived as agents of economic, social and political change. From this has come the more recent notion that informatization should be perceived as an agent of change and a powerful source for development (Doderick and Wang, p. 16).” It is important to recognize that information is an agent of growth in the new economy with far reaching implications for the future development of industry and community relations. As the previous sections have demonstrated, information is only valuable insofar as economic agents use it as a part of a process. The development of a product can no longer be treated as a series of disjointed activities but rather the collective efforts of a social unit.

Julien explains that, “industrial districts constitute areas of communication and that the sharing of economic socio-cultural and political information accounts for their cohesion over time. They form special environments in which ‘communicational acting’, as Habermas [1987] explains, ensures cultural reproduction and social integration within the family and hence within the community, at work and in the business world and thus in industrial development too (Julien, p. 199)”

Julien recognizes that within industrial districts, the function of sharing and exchanging information has become institutionalized. However, in the current environment, Julien maintains that cooperation and institutional intervention are required to sustain their viability. They must, on the one hand “develop new national and international antennae while on the other hand developing new skills in the filtering,

evaluation and use of information reaching them from this environment. In other words, the response of districts to the turbulence of their environment has to involve a heightened awareness of the development of national and international markets, a well-tailored adaptation of production organizations to the new aspirations of workers, and an increased sensitivity to technological transformations (as well as efficiency in introducing them) and a constant capacity for innovation ... But at the same time to preserve their cohesion, districts must adapt this new information to their socio-cultural and political needs (Julien, p. 200).”

The next chapter will use the sentiments of Julien as a springboard to examine how information and the communicatory approach to economic development have been integrated into a vibrant local district in southwestern Ontario known as Canada’s Technology Triangle.

Chapter Three

CANADA'S TECHNOLOGY TRIANGLE

SECTION 1: INTRODUCTION

Chapters one and two investigated the possibilities and potential consequences of organizing business into local industrial districts and the importance of information and the communicatory approach to their success. The thesis now turns to a specific area in southwestern Ontario that has achieved some of the economic successes that analysts have trumpeted can flow from regional economic efforts. The area under study is known as Canada's Technology Triangle (C.T.T.) and it is recognized for its successes in high technology enterprise.

This chapter is going to explore C.T.T. in the context of other local economies and their successes. It will also deal with information, networking and the importance of developing a communicatory approach to economic development in today's flexible environment.

SECTION 2: METHODOLOGY

In order to obtain a better understanding of how business within C.T.T. have evolved, a series of 16 interviews with key business leaders were conducted. The interviews focus on HOW the companies conduct business in C.T.T. and leave aside specific details about WHAT their businesses do.

The companies were selected from a cross-section of high technology companies and those that support high technology efforts (i.e., distributors). Care was taken to ensure representation from each of the four cities that comprise C.T.T. and different areas of specialization. In most cases, the proprietor or president was interviewed although in

some cases a comparable alternate was interviewed (in one case, a small focus group of three Vice Presidents with different line responsibilities was conducted). The sample reflects the overwhelming presence of small and medium sized enterprises with less than 20 employees in the area; however, a number of interviews were also conducted with executives of larger companies. These larger companies are significant generators of wealth in C.T.T. and must be included to understand what role they have assumed in the larger dynamic of C.T.T. Further, while the success story of C.T.T. is primarily based on the collective successes of its small enterprises, Bennett Harrison's study of corporate restructuring traces the devolution of community based economies to the actions of lead firms (see chapter one). Consequently, it was important to this project to discuss community activities with larger companies to determine if they could undermine the synergies that exist within the business network.

Number of Employees	Total Number of Interviews
Less than 20	7
21-50	4
51-100	2
101-1000	2
1001+	1
Total	16

The data derived from the interviews are qualitative in nature. While the results cannot be extended to the entire business community in C.T.T., they provide insight into the motivations of individual players, the perceived benefits of conducting business in C.T.T. and the nature of the relations that exist in the community. Due to the qualitative nature of these interviews, the data gathered will not be presented in aggregate terms nor will they take the form of a narrative. Rather, they will provide the material grounding for the theoretical conclusions and discussions that this thesis explores.

The field research for this thesis project was conducted in the summer and fall of 1995. In addition to these core interviews, the chair of the C.T.T. Board of Directors was interviewed in the winter of 2000. This interview allowed me to trace the evolution of the area.

SECTION 3: CANADA'S TECHNOLOGY TRIANGLE -- AN OVERVIEW

As explained in chapter one, the premise of Alfred Marshall's industrial district model and the notion of the *collective entrepreneur* that is advanced by Michael Best are based on a region's ability to achieve external economies. For Alfred Marshall, these economies came in three distinct varieties: economies of specialization (as a result of division of labour between firms); economies of information and communication (due to joint production of non-standardized products); and economies of labour (derived from having a large resource of trained labour available) (Zeitlin, p. 280). Marshall's districts were also predicated on an industrial atmosphere that ensued from the interaction of local business people who enjoyed a long history of collaborating and innovating collectively. As Jonathan Zeitlin explains, students of Italian industrial districts have honed in on Marshall's notion of industrial atmosphere and advanced a model that is decidedly more social in its focus. In particular, these scholars have augmented the notion of an industrial district and recast it as a *socio economic notion*. This view emphasizes the non-metropolitan character and small town environment of an area, its common value system, its commitment to cooperation and a collective identity as well as a social structure that is borne from the preponderance of small and medium sized enterprises in the community (Zeitlin, p. 281). Research also indicates that industrial districts span sectors and have evolved in countries with diverse economic bases and social histories (i.e., Italy, United States of America). Furthermore, different regional experiments have

met different levels of success -- in fact, some might even be classified as failures. This enhanced appreciation for the range of characteristics that can define industrial districts will provide the entry point for interpreting the nature of business relations in C.T.T.

C.T.T. is a hub of high technology enterprise that encompasses the cities of Cambridge, Guelph, Kitchener and Waterloo, Ontario (each city is within a 30-minute drive of any other member city). In 1987, the C.T.T. came in existence as a result of the four cities' belief in cooperation and their faith that they could collectively achieve international notoriety by banding together and drawing on their complementary strengths. Their name is a derivative of the Research Triangle in North Carolina (Bathelt and Hecht; 1990, p. 226).

There are 367,000 residents in C.T.T. Thirty-one percent of residents indicate more than one ethnic background and a single ethnicity does not dominate the region. A plurality (13%) are British but fewer than 5 percent claim any other single ethnicity (although all respondents indicated the community partakes in a German heritage). English is the mother tongue for four-fifths (84%) of residents and no other language garnered more than 1 percent of total mentions. The mean income for men is \$34,000 while the mean income for women is \$20,000.

Consistent with the defining characteristics of industrial districts noted in the literature, C.T.T. is not a metropolitan centre itself but enjoys close proximity and ease of access to the major metropolitan centres of Toronto, Detroit and Buffalo via HWY 401 (formally the MacDonald Cartier Freeway). In addition, the area has its own regional

airport (the Waterloo-Guelph Regional Airport) and is on the rail and bus routes that physically connect the region to North America and the rest of the world.

C.T.T.'s infrastructure has been developed to support the activities of the region and to encourage the growth and development of high technology firms and their innovative pursuits. With over 15,000 companies in the region, the C.T.T.'s strength is its collection of 400 high technology enterprises (employing 25,000 people). It is one of the strongest regional economies in Ontario and accounts for approximately 5 percent (\$17 billion) of the total provincial output. Looking exclusively at the community's high technology sector, the most predominant businesses in the community are computer companies (hardware/software) that account for 39 percent of all high technology businesses. The second most popular type of high technology businesses are environmental companies (14%), followed by manufacturing companies (13%) and test measuring establishments (7%). The top ten is rounded out with biotechnology firms (5%), industrial automation companies (5%), telecommunications enterprises (3%), photonics companies (3%), energy establishments (3%) and medical companies (3%). Having said this, the concentration of high technology enterprises has led to the establishment of a resilient economy with a diverse array of services designed to support and sustain the high technology sector. These include lawyers and accountants with specialization in research and development legislation, international trade and patents. In addition, the region is home to eight insurance company head offices.

Echoing the sentiments advanced in C.T.T.'s marketing literature, respondents comment that the companies in the region share a common drive toward innovation. In keeping with the principles outlined in Best's The New Competition, C.T.T. offers many

technology resource and support services (i.e., what Sabel has called the extended service model) designed to increase local cooperation, break down boundaries between firms and across divisions within a company and foster the innovative process.

C.T.T. has three universities and a local community college. The University of Waterloo has a sound reputation in computer science, engineering and mathematics. Wilfrid Laurier excels in business and economics. Guelph is recognized for its expertise in agriculture, veterinary medicine and biotechnology. In addition, Conestoga College provides a range of technical diplomas and offers industry-supported training. The presence of these institutions is not only important to the extension of knowledge; they also provide business within the community with access to a highly skilled workforce. In addition, they allow companies an opportunity to keep in touch with the research that is being pursued at the universities and allow universities access to private companies who are pursuing commercial projects in similar fields. Furthermore, the university laboratories have spawned many university spin-off companies and respondents indicated that they often engage in formal and informal collaborations with the university on an on-going basis.

The three local universities and the community college are also involved in providing services. At the time that this research was conducted, the University of Waterloo housed the Canadian Industrial Innovation Centre and Information Technology Research Centre, Wilfrid Laurier ran the Trade Development Centre and the University of Guelph hosted the Collaborative Research and Development Centre. The University of Waterloo also runs a high profile cooperative education program where students are provided with an opportunity to intern at a company. Even in those circumstances where a student opts to

intern outside the community, he or she becomes an unwitting ambassador for the region. One respondent indicated that when he was negotiating with a distributor overseas, he was happy to discover that it had sponsored a Waterloo co-op student a number of years ago. This experience provided the two business people with a common experience and helped ease their negotiations. The University of Guelph also has a 'Research Lane' where private enterprises can lease space and enjoy close proximity to the university. Similarly, since this project was undertaken, the University of Waterloo has built an industrial park where it leases space to private companies. Each of these programs facilitates an informal cross-fertilization between the universities and private companies. These centres and services are demonstrative of the region's commitment to the development of the area's high technology industry as well as the active role that the university has assumed within the community.

Aside from the collective efforts of the universities, the board that oversees the joint efforts of the C.T.T. also supports the activities of the private industry that encourage cooperation and innovation. These organizations go beyond the scope of the services offered by a typical Chamber of Commerce. For instance, the Board has created the C.T.T. Export Network, the Global Entrepreneurship Centre, and the New Venture Development Programme. Each of these programs is the result of the collective efforts of the C.T.T. Board and local entrepreneurs striving toward the common goal of local development.

Beyond these institutional/formal networking opportunities, there is also an informal tier to development within C.T.T. There is an extensive set of social relationships that respondents attribute to a common background shared among those who work in the area.

Respondents believe that their collegial sentiment toward one another stems from the fact that they attended the same universities and that they enjoy the same social and recreational events that are part of the C.T.T. environment. A certain amount of intellectualizing surrounded respondent's response to this line of questioning. When they were asked if a University of Toronto graduate would be ostracized within the community, they all pointed to a very successful colleague who was not a graduate of a local university, or raised in one of the four cities and shrugged their shoulders at why their formula failed. I uncovered a certain degree of story telling among respondents who were inventing and simultaneously believing in a tale about the magic surrounding the area's success. The processes involved in this "story telling" and its impact on economic development will be discussed in chapter four.

A number of other social opportunities are available to residents of C.T.T. Specifically, local businesses have organized a softball league where firms and individuals can play against one another. Also, a local firm hosts a Christmas party and the invitation is extended to all computer companies in the region. In addition, local bars serve as a venue for information exchange and a number of respondents indicate that they look forward to "talking shop" with their colleagues from other firms along the side lines at their children's soccer games and in the stands at the local hockey arenas. A common work environment has provided a basis for friendships and conversation and contributes to the cross-fertilization that exists in C.T.T.

SECTION 4: THE GEOPOLITICAL CHARACTERISTICS OF C.T.T.

At this point C.T.T., the institution that fulfills a marketing role and acts as a clearinghouse for information must be distinguished from C.T.T., the phenomenon.

While it is true that the name C.T.T. is the product of a marketing initiative designed to entice companies to the region; the benefits that businesses derive from locating in C.T.T. are real. Businesses have prospered because of the synergies that exist in C.T.T. and the business community that has grown around the high technology sector. The latter were the primary focus of the interviews undertaken for this study. Recognizing that industry is undergoing a transformation and reorganization as a result of changes in demand and technological development, this section will attempt to situate C.T.T. in the context of this evolving market and other districts around the world. In particular, it will examine the relationships between global and local economies, the large firm, the nature of the collective resources that exist in the community and the industrial atmosphere that has permeated all business activities.

A) The Global/Local Dynamic

The preponderance of international trade and the efforts directed at building a global market have tended to subsume all economic policy initiatives. Governments and capital have developed policies that prioritize the activities of the global economy while the national economy is simply adjusted to follow the course of global machinations. The Free Trade and North American Free Trade Agreements together with the massive deregulation initiatives undertaken by governments serve to deepen capitalist hegemony and the interests of the global economy. According to Clause Offe's theory of state intervention, the government is a capitalist government and its activities must sustain and enhance the accumulation process and the advancement of capital. Under his theory, the capitalist state must support legislation that will support the pursuits of capital or it will undermine its own existence. The logic embedded in these decisions circumvents the

possibility for alternative (namely indigenous) sources for renewal to be considered at the level of macro-economic policy. Government strategy has thus become a self-fulfilling prophecy in which large multinational corporations are provided with the space and leverage to grow and they in turn successfully employ that leverage to fill that space.

However, this policy imperative neglects a major point. Even as markets and production processes expand globally, regional economies can provide a viable source for economic renewal because they can capitalize on their collective strengths to produce innovative products, which are required by the global market, in a flexible manner. The retreat of the federal and provincial governments from these pursuits has resulted in local and regional governments assuming a lead position in directing their own economic circumstances and ensuring that they can stake out a role within the global economy. According to Offe's theory of state intervention, the local governments have not become the fiduciaries of community development; rather, they answer to a different capitalist order. To ensure its own survival, the local government must ensure the advance of local economic actors. Given the state's interest in sustaining local capital, they shape and develop policies that will advance the pursuits of local businesses.

Respondents in C.T.T. were unanimous in recognizing the strength and importance of the global market to the success of the area and their individual businesses. With notable exceptions of companies who develop specialized products for mass markets (i.e., wireless Internet technology) most companies are niche-market businesses that have a large percentage of a very small global market. They are specialized companies with very little competition across the globe and even less competition in C.T.T. As such, a sound global market for the region's outputs supersedes the internal composition of the

district. As one proprietor of a small computer software development company explains, "Our success or failure is really based on the global economy, not the local one. The local economy provides a critical mass of the intangible resources like labour, university resources, and social and business networks." These "intangibles" constitute the external economies that Alfred Marshall explained flow from local industrial districts. It is by reinforcing the internal dynamism of C.T.T. that allows its companies to achieve an international presence and success.

The area's success stems from the synergies that ensue from the local relations that are characteristic in C.T.T. While some respondents remark that there are some benefits to being close to one's end users, they also indicate that new information technologies and ease of travel eliminate this as a significant factor when considering where to locate one's business. Also, the specialized markets that C.T.T. businesses are pursuing are geographically dispersed and consequently, it is impractical to try to locate near one's final market. Admittedly, local companies who provide products to local businesses acknowledge the benefits of being able to drop in to a planning meeting without having to board a flight or use teleconference/video conference, but they emphasize that these benefits are minimal. Instead, a respondent remarked, "we are very much a global company in terms of where our sales go and in fact, probably about 95 percent of sales are export. The product that we sell is of a nature that location is not important to our customers, but it has proven to be important to us." That is, the industrial atmosphere that surrounds C.T.T. stimulates the advancement of capital through direct interaction of companies with similar objectives and their collective ability to tackle business issues. The C.T.T. experience reinforces the reality that niche market driven enterprises will fare

better if they choose to locate close to other companies pursuing similar endeavors rather than the end user itself. This is because of the industrial atmosphere that envelops the region.

The purpose of this section was to point out that companies in C.T.T. do not exist outside the logic of the global economy. In fact, they are very much a part of it. Success for C.T.T. has materialized through an understanding of the global market and by taking the necessary steps to ensure an active role in its dynamic (in fact, a C.T.T. Export Network has been developed where companies can share personal anecdotes about their experiences in Japan or detail the successful relationships that they have built with customs brokers and distributors). The C.T.T. experience would not be as successful as it is if it chose to insulate itself from the shocks and potential downturns of the global marketplace. The global economy sustains the activities of a successful local district while the local district simultaneously sustains the global economy. A Vice President of an imaging company remarked that, "if we only focussed locally, our business wouldn't be anywhere today." However, without the benefit of the local economy and its industrial atmosphere, it would not have the where-with-all to achieve global success. Conversely, without the specialized focus and expertise that flows from regional experiences, the global economy would also face a crisis because it would not have access to the products that flow from industrial districts.

B) Breaking down Hierarchy and the Entrepreneurial Firm

C.T.T.'s marketing material explains that "the entrepreneurial spirit is alive and well in the Triangle (C.T.T. - The Growing Advantage)". I believe that there is an innovative esprit in C.T.T. that by happenstance has spawned a unique meld of business relations

and supersedes the entrepreneurial spirit of the region. While this assertion may seem naïve, it must be clarified from the outset that the extension and growth of capital are clearly priorities for business people in C.T.T. and that entrepreneurship does exist in the region. However, it exists in the shadows of innovation. The capacity for C.T.T. firms to innovate provides the region with a competitive advantage. The small-firm executives interviewed for this study provided almost identical descriptions of how their companies started. They each explained that their companies evolved from the basis of an idea that "took off". They described their technological products in an organic manner and emphasized that they/the proprietor of the company did not necessarily set out to start a business. Instead, they explain that the research that they undertook in completion of a graduate degree or a product that they were involved in at another company evolved into a marketable commodity.

They also emphasize that their companies did not find their way into the marketplace by producing inexpensive products and by undercutting competition. Instead, they created unique and innovative products that, by and large, were not price sensitive (however, a number of respondents caution that price is not completely elastic and that they need to be wary of what the market can withstand). Respondents indicate that they succeed on the basis of being first in the market with new products and by constantly evolving and improving existing products. They are innovators.

Companies collective support of one other's innovative pursuits distinguishes the region from other business experiences. An economic model has evolved in C.T.T. that supports the innovative process and has distinguished it from other regional experiences. The primary support for the innovating firm is found within the actual firm itself and in

the nature of its relations with other companies. Internally, businesses in C.T.T. have cast aside hierarchical communications patterns in exchange for a style that encourages continual learning and the evolution of new products for a changing market. Research participants describe their business structure as flat. With the exception of one company in the sample where divisions are each treated as their own profit centres, all other respondents indicate that communication flows across divisions and that each employee is encouraged to participate in the planning and execution of most projects. In most cases, companies make use of teams comprised of employees with different expertise and frequently, the end-user (client) is also a part of the development process. Together, they determine what needs to be done and how to achieve the desired objective. This system encourages innovation by exposing product designers to a continuous flow of new ideas from a variety of sources. It also helps to keep individuals apprised of what is in demand.

Having visited 16 firms in the community, I realized that even the architecture of the office spaces mirrors the non-hierarchical approach to business that exists in the community by encouraging the interaction of employees. While some offices do not even have walls to separate the desks from one another (admittedly a cost saving measure in some organizations), most of those who do have walls have placed a premium on the comfort and appeal of common spaces. In particular, the boardrooms and team spaces where employees work are typically located along the outside walls with windows while the executive offices occupy the inside spaces. One respondent remarked that this allows employees to interact with one another on an ongoing basis as they each thrash out

business and technical problems throughout the day. Their office spaces are reminiscent of the famous Intel head office where even the president sits at an inside cubicle.

Some respondents attribute the flat organizational structure that dominates small and large firms alike in C.T.T. to the innovators who began the companies. One proprietor remarked that, "you can't presuppose that companies that are started by technologically oriented innovators, who are typically brilliant, nerdy, control-freaks, would have a hierarchical relationship with either the people who they employ or the outside community." Her statement reinforces the earlier claim that a passion for their work provides a sound basis for economic behaviour in the C.T.T. as opposed to a drive to be successful business people. Characterizing intrafirm and interfirm relations, a respondent commented that the area has a "let's all roll up our sleeves and get things done approach to business matters."

Two companies that appeared to have hierarchical structures based on the titles of its employees (managers, directors, vice presidents, etc.) discounted the importance of these markers. One indicated that they simply serve as an indication to the outside world that the individual has experience and the other respondent indicated that in the context of a 100 person organization, titles and divisional boundaries do not interfere with inter-office relations.

Upon the completion of an interview, a proprietor invited me to observe the workplace dynamic at his company. One of the most striking things about his business was the familiarity that the four employees had with one another's projects. When one employee asked for assistance on a project, he did not have to recount the project's

objectives and the stage of development that he was at to his colleague -- they were able to jump into his work with incredible ease. When the proprietor was asked to comment on this, he remarked that they all share the same "head space".

The companies have extended the principles of cross-fertilization and made it part and parcel of all activities that they undertake. In particular, they carry-over this flat philosophy to their relationships with their clients. One executive indicated that the genesis of one of his company's most financially successful products was developed through a collaborative relationship with a client. A local manufacturer approached his company with a technical problem that they were experiencing with a part that was being installed into the machine that the client manufactures. The client invited the supplier firm to his plant where he demonstrated the inadequacies of the existing component and explained what their expectations were for their own equipment. The two companies started to fine-tune the product to create what the client needed. Through this relationship, a chip was developed that met the client's needs and provided the supplier company with an entry point into a new market. In the years ahead, the supplier upgraded and modified the chip and kept the initial client apprised of the developments that they were making and in turn, the purchasing firm kept the supplier informed about their plans for the future and indicated what their future needs might be. As a result of the success of their past collaboration and an appreciation for the work that the supplier was undertaking, the client has agreed to test drive upgraded components in the future to ensure that they would meet industry expectations.

This relationship points out a key difference between supplier relations in a flexible environment and those that persist under Fordism. In this case, the client had a grand

plan and hoped to develop a product to perform a specific function. However, its in-house expertise was limited and supplier firms were required to assist in the development of their product. Under Fordism, the client would simply provide a blueprint for the part that was desired and it would fall to a supplier firm to produce the product at the lowest possible price. The notion that the two companies could collaborate to improve both the part and the end product could not happen under Fordism's rigid structure and its use of dedicated machinery. In fact, it might have put the entire system in crisis. In the example illustrated above, the client is relying on the supplier's expertise to develop a product that will meet certain outcome specifications not design specifications. Having said this, the purchasing company often has certain design requirements such as the product's ability to withstand certain gravitational pressures or its compatibility with certain operating systems that the supplier must adhere to.

While the collaborative business approach was recounted time and again by the executives interviewed, the Fordist structure continues to exist alongside it. In fact, an executive from one of the most successful businesses in the region remarked his company does not always know what function the products that they manufacture perform. They are provided with design specifications and his company replicates the design at the lowest price. While this company's function clearly fulfills a market need, the company is simply an order taker and its role is limited and ultimately expendable (or at least replaceable) in the greater scheme of global business praxis.

In Silicon Valley, the innovative experience is enhanced in a similar manner. Anna Lee Saxenian explains that the boundaries between firms are blurring. She explains that companies in Silicon Valley are notably different from their competitors around the

world in how they treat their suppliers. In particular, suppliers are treated as partners and information flows across corporate lines. During the 1980s, companies in Silicon Valley redefined their relationships with their suppliers. Suppliers became partners in the design, development, and manufacturing of new systems. These collaborations permitted the customer and supplier to acquire more expertise in a particular niche business and ultimately become more profitable.

Saxenian recounts that, "in many cases, the flow of information between the two firms was continuous, occurring across different levels of the organization and different functional specialization (Saxenian, p. 148)." In other words, there was blurring of corporate boundaries. According to the senior executives that Saxenian interviewed, this system had the effect of creating a mutual dependency wherein the success was shared by all of the involved parties and was undoubtedly occasionally shared with one's competitors. Saxenian explains that a vice president at Maxtor heralds these synergies and remarks that, "in the really good relationships, we're sharing process technology and knowledge back and forth with our suppliers, just like we try to share information across functional groups within the company (Saxenian, p. 147)." This resulted in information flowing more freely between firms as they engaged in cooperative practices that defy the bounds set up by a traditional definition of market relations and ultimately led to the long-term success of Silicon Valley.

While the structure of the individual firms and their relationships with their clients contribute to the development of business synergies, the relations that companies have with one another are even more important to the continued success of the region. That is, the relationships that exist between individuals who may never compete for a bid, or

formally collaborate on a project are of outmost importance to the generation of knowledge and the flow of information within C.T.T. It is through these relationships that information is transmitted from one company to the next and contributes to the accretive process of innovation. One respondent commented that he is *hard nose honest* with his colleagues in C.T.T. He explained that he is *hard nosed* about his business in the sense that he pays a lot of attention to detail and he is honest because he shares key information about clients with his colleagues in C.T.T. He also indicated that his colleagues reciprocate his approach. Respondents recount endless examples of scenarios where they have shared confidential information that they want advice on and give one another access to information about their clients. Throughout the interviews that were conducted for this study, it became apparent that these types of relationships are only possible because of trust.

One respondent mentioned that should a business learn that a colleague is negotiating with a company with whom the first company had brokered a successful contract with in the past, the first company would likely impart the negotiating technique that was used to the second company. While you would be hard pressed to find a company willing to devote a week to a colleague's project, it is not uncommon for them to share files, build on one another's successes and learn from each other's failures.

One respondent described the network as a "tapestry -- a weaving where it sometimes becomes difficult to know where one company begins and another ends". Another respondent indicated that her company has "intimate" relationships with other companies in the region. Rather than concentrating on the net economic gain or loss by choosing to share information with one another, their relations with one another prioritize the

development of sound products in an expedient manner and ultimately, the collective improvement of the network as a whole. While the executives interviewed in C.T.T. do not consider information a "public good" (as Michael Best describes it in the Third Italy), respondents explain that it is like having access to information with privacy limitations.

In sum, companies have successfully broken down hierarchical patterns of development and replaced them with lateral communication flows. This has in turn left individual firms with the flexibility and confidence to create new products in response to the niche-market needs of the global economy.

C) Co-Opetition

The business ethos and configuration of companies in C.T.T. closely proximate those that Anna Lee Saxenian uncovered in Silicon Valley (Saxenian, pp. 2-3). Participants in this study described C.T.T. as a regional network where ideas and capital flow. Some common elements recurred in respondents' descriptions of the region's economic make-up. In particular, respondents commented on the extensive opportunities for collective learning in the community through formal and informal networks as well as the ongoing tension between cooperation and competition and the region's attempts to strike an appropriate balance between these two polar terms.

The key to the unique meld of business relations in C.T.T. is the belief in what one respondent described as "co-opetition". Under the system of co-opetition, the respondent remarked that companies cooperate regarding business issues and collaborate with partners in the area with different internal competencies while at the same time, they feel free to compete with one another on specific business pursuits. However, the area's focus

on niche-market businesses has meant that companies are rarely dead-on competitors even though they build their product from the same base of information/knowledge. This, in itself, has made collaboration within C.T.T. relatively easy. Companies recognize that the potential to lose a business opportunity to a colleague in the area is minimal. Further to this, there is a realization that the individual successes of companies in C.T.T. culminate in the overall health and vitality of the region that in turn breeds more individual successes. While the substance of their relations may be similar, this contrasts with the collective experience in Silicon Valley where companies are more often direct competitors. Unlike in Silicon Valley, where a number of companies are engaged in the same businesses and are often bidding for the same contract or are seeking a share of the same market, companies in C.T.T. are rarely dead-on competitors.

The small firms that dominate C.T.T.'s landscape participate in government and privately sponsored affiliations to advance their businesses and extend the principle of cross fertilization and learning beyond the boundaries of their own companies. As explained, companies frequently share business information with one another. C.T.T. has spawned a series of offshoot organizations that this research suggests actually propel the community beyond the 'catch-phrases' and snappy marketing ploys being promulgated by the economic development offices. It is through these organizations that communications between firms is improved and the pursuit of new opportunities is encouraged. These associations include the Computer Technology Network, Canada's Technology Triangle Export Network, Business Community Programs, Canada's Technology Triangle Enterprise Centre and the Canadian Institute of Technology for the Environment.

The Computer Technology Network is an industry-driven association for businesses within the information technology sector of C.T.T. Through the support of the ITRC (Information Technology Research Centre at the University of Waterloo) it enhances the work undertaken by nearly 100 members. Canada's Technology Triangle Export Network is a trade association formed to promote interaction, growth, and expansion on a global basis through information exchange and member cooperation. Support is provided to the more than 40 members who are actively pursuing export opportunities. Business Community Programs is an alliance of the private sector, the C.T.T. steering committee, the local universities and the Ontario Ministry of Economic Development and Trade. Support in the areas of investment, technology, human resources and marketing is provided to small and medium-sized enterprises to help them become more globally competitive. Canada's Technology Triangle Enterprise Centre is an initiative to help firms with less than 10 employees and \$250,000 in sales become more proficient in entrepreneurial management development, training and support services. Several organizations including the Laurier Institute of Wilfrid Laurier University, Conestoga College, University of Waterloo, the Innovation Centre and the Self-Help Centre will provide the needed support. Finally, the Canadian Institute of Technology for the Environment (CITE) is spearheaded by the University of Waterloo to help encourage the commercialization of environmental technology both at home and around the globe. Over 100 local environmental firms are active in the organization.

The ability to envision a world beyond traditional business praxis has spawned institutional alliances among companies within C.T.T. During an interview, a founder of

C.T.T.'s Computer Technology Network (C.T.N.) recalled the genesis of the network.

She explains that,

I was calling around to my colleagues when I was getting ready to make my first trip to Japan and I realized that Canadian software developers were looking at the world through distant horizons. Because our market is the world, we are often too busy concentrating on our end markets to realize that our neighbours are engaged in similar projects. I could be thrashing out a problem, but I was never calling my counterpart at Watcom. This realization caused me to put the wheels in motion for a loosely structured alliance of companies in the community.

The C.T.N. now boasts two tiers of membership. Between September and June, C.T.N.'s first tier schedules monthly meetings where special topics that affect the computer industry are explored. As one respondent explained, the C.T.N. makes use of its individual members' networks to help other companies come to terms with doing business in a rapidly changing global economy. The C.T.N. has sponsored meetings with venture capitalists, panels with lawyers with expertise in international contract negotiations and sessions where the specifics of setting up a trade show were addressed, as were the keys to successful media relations.

The second tier of C.T.N. is called Atlas. Comprised of 10 members, it is a senior affiliation where strategic considerations that would not be of concern to the broader C.T.N. membership are discussed. At Atlas' monthly meetings they address issues such as searching for a Board of Directors, preparing for an initial public offering and the development of a government relations strategy that has involved pressuring Revenue Canada about its existing Research and Development tax credit system.

It is not simply the nuts and bolts of conducting business in today's environment that distinguish the C.T.N. from other associations. After all, the monthly agenda closely

resembles that of any Chamber of Commerce. Rather, it is the sentiment that spawned the creation of the C.T.N. and the energy that propels it forward to ensure its continued growth and success that are noteworthy. The C.T.N. example is demonstrative of two key elements that distinguish C.T.T. from other communities. The fact that an independent businessperson undertook the initiative to develop a system whereby companies can share information with one another bespeaks the level of social embedding that exists in C.T.T. In addition, this business network itself has become a means of promoting and spreading the very sentiment that inspired the network's creation in the first place. While the companies engaged in C.T.N. are all employed in the computer/software development industry, it is important to realize that the C.T.N. is interesting, not as a case study of WHAT is involved in developing high technology enterprises; rather it serves as a blueprint for HOW businesses can communicate with one another to achieve success.

A participant in C.T.N. spoke highly about the network and explained that in the beginning, it took a while for everyone to determine how the system could help everyone's business grow. He remarked that in the fast-paced environment of software development, you barely have time to keep abreast of changes with your own suppliers. But, he comments that through the C.T.N., and in fact the entire range of activities that comprise C.T.T., he has enjoyed considerable rewards. He remarks that,

You've got people looking out and looking over and reaching their hands across to colleagues in other companies and saying, 'listen, you've got this, and I've got that and together we can do thus and so' or 'I've got this and no longer need it because I've changed the core direction of the company, but you might have a good use for it'. That's really when you see collaboration happening and you see almost spin-offs of the spin-offs -- that's what I call a really well established second generation economic presence of an industry and that's what I think is happening around here.

Along with formal associations and collaborations that have evolved under the strict formalities of legal documents and with the assistance of government programs (i.e., CANARIE), there is also a collegial sentiment in the community. Companies share both technical as well as business information with one another and collectively advance the pursuits of the region to the rest of the world. Respondents indicated that when they are conducting business in other parts of the world, they become ambassadors for the region. Throughout the interview process, a certain intangible philosophy toward their colleagues and an excitement about pursuing one's interests were evident. While it was apparent that the rules of neoclassical theory are counterproductive to business in C.T.T. there was a commitment to the region that extended beyond the typical quid pro quo of business. However, it is uncertain whether cooperation begets economic successes in C.T.T. or economic success begets cooperation. Holders of the first option attribute the success of the region to an innate willingness to cooperate based on common experiences such as friendships made at the University of Waterloo, or a common German background (NB: fewer than 5 percent of residents claim any single ethnicity other than British). Respondents also believe that the cooperative esprit in C.T.T. is fleeting and that the relations will disappear when a new generation of businesses develops. Alternately, others explain that businesses within C.T.T. recognize the tangible economic benefits of sharing information and have made conscious decisions to partake in the business

networks that exist in the community. Regardless, co-opetition has permeated business relations in C.T.T. wherein businesses freely share information with one another about doing business and frequently collaborate on specific projects. In particular, they will share information about obtaining venture capital, negotiating with international customers and accounting procedures.

Whether these ties are real or imagined, on the surface they appear to have substituted the cooperative political agenda in the Third Italy that has been credited with the area's success. According to Charles Sabel, they are a part of the mythology that sustains an active economy. The particulars of Sabel's argument and its relevance to the reproduction of industrial district style relations will be explored in further detail in chapter four.

D) Large Firms

The relations in C.T.T. can be distinguished from those that Anna Lee Saxenian traced in Route 128 on the basis of the engine of growth. C.T.T.'s economy is propelled by the collective strength of the 400 high technology companies that are located in the region while Saxenian remarks that a small number of large hierarchically structured companies are the primary centres of wealth generation in Route 128.

The prevalence of small firms and their ability to spur development has been the subject of study in the Italian experience as well. Giacomo Becattini provides an overview of the literature on the phenomenal explosion of small firms in Italy. According to Becattini, some scholars have explained the growth of the small firm as a response to changes in demand and technological changes in production methods while

others attribute it to geo-historical peculiarities that have inevitably spawned small firm development. The former group emphasizes external factors of the global economy and shifts of complete systems while the latter focuses on those endogenous factors such as culture and local experiences. This study found that the growth of small firms in C.T.T. is more easily explained through the principles of the first explanation. The first explanation recognizes that a fundamental shift in consumer patterns is underway and that the small firm is inherently better suited to respond to the new marketplace that exists today.

While small and medium sized companies dominate C.T.T., a number of well established national and multinational companies are important generators of wealth and employment in the community and play a role in the region's overarching culture. Three large companies (500-plus employees) were included in the sample for this study. One of these companies indicates that it operates independent of the C.T.T. infrastructure. The respondent from this company explains that aside from training through Conestoga College, the transportation infrastructure in the region and the "small-town lifestyle" that its employees enjoy, it derives minimal benefits from being located in C.T.T. Nevertheless, the other two companies are entangled in the day-to-day dynamic that defines the C.T.T. Each derives different benefits and contributes different elements to the region's character.

One of the companies is a large multinational corporation with plants all over the world. The plant in C.T.T. directly ships its product to 95 countries. This company chose to locate in C.T.T. because the composition of the business community allows it to leverage the expertise that it has in-house. In addition, the universities provide it with

access to the right people with the necessary skills to advance their business, the existing industrial base of the region and the expertise that is housed in the universities. These external economies proved more important than any hard and fast financial incentives to the parent company. When determining where to locate its new plant, the company chose C.T.T. in spite of the Irish Development Authority's promise of subsidies in exchange for them locating in Dublin. The other large company is a Canadian-grown success story. It is a University of Waterloo spin-off that has remained a privately held company with an allegiance to the community and feels indebted to the region for its own success.

While Bennett Harrison warns that the entrance of a conglomerate to a region is part and parcel of the inevitable deterioration of an industrial district, the C.T.T. experience does not sustain his thesis. As recounted in chapter one, Harrison purports that a company's success makes it the inevitable target for a take-over by a multinational corporation. He advances that under the new ownership structure, the interests of the parent company will supersede the interests of the community and ultimately disturb the dynamic of the area and place it in a state of crisis. While the multinational company interviewed in this study did not buy out an existing company in C.T.T., it is nonetheless a dominant feature in C.T.T. and should have the same tendencies that Harrison uncovered in his study. However, it does not demonstrate an allegiance to its parent company that would threaten the balance of business relations in C.T.T. The executive of the company who was interviewed explained that the company has an economic interest in maintaining the balance of relations in C.T.T. because they provide the basis for the company's own success. In fact, it is the balance of cooperation and collective services

that enticed the company to the region in the first place. To systematically undermine these synergies would threaten its business.

In addition, Harrison warns that the success and growth of a company within a district threatens to systematically break down the flexible relations that define the area. He explains that a company's success will make it necessary to permanently employ other companies in a community to help it meet its increased production needs. Harrison believes that companies will trade in their freedom to conduct business with one another in exchange for secure business from the *lead firm*. In turn, this will ultimately impair the district because it eliminates the cross-fertilization that occurs in a district as a result of constant interaction with different partners. This eventuality has not occurred in C.T.T. and is not likely to take place should any of the existing small businesses grow. The executive that was interviewed indicates that his company is a university spin off whose success is found in the unique product that it developed at the University of Waterloo. He further explains that the company's continued success is premised on its ability to respond to the world's growing need for unique and specialized products. Through the deployment and redeployment of their collective skills and know-how, companies in C.T.T. achieve a competitive advantage by creating and developing new products for an ever-changing global market. The university spin-off company developed a sound business on the basis of the research that it carried over from the university, but it is through constant innovation and the development of new products that it has grown to its current size. Alternately, the districts that Harrison studied in the Third Italy manufacture tiles or garments and changes to the end product are a matter of aesthetic alterations (i.e., colour and design) and not the evolution of a fundamentally

new product each season. As such, smaller companies might be permanently employed by the lead firm to meet their production needs. However, in the C.T.T. experience, a company cannot be continually employed by a lead firm to create a component part because the lead company's very success is premised on its ability to reengineer and develop new products on an ongoing basis that will not always require a standard mechanism. The company must have the flexibility and the opportunities to align with different producers on each project. In other words, the very nature of the markets that the companies serve globally and the very essence of their individual successes require the continual recombination of resources across companies within the district.

The two large companies discussed above have not soured relations in C.T.T. Instead, they operate within its logic and appreciate its ability to help advance their own businesses. Neither company has an economic interest in disturbing the balance that exists in the community. This research also suggests that the existence of both large and small companies that do not participate in the activities of C.T.T. will neither disturb the relations in the Triangle nor limit the success of the individual companies. As mentioned earlier, the industrial district model is merely one possible configuration for businesses and governments to pursue in today's global market. It is not being advanced as the sole means to find success in today's environment (although it is being put forward as one of the most efficient and successful). Having said this, it follows that just as a company, large or small, can be successful in non-industrial district settings, it can just as easily set up its business within C.T.T. and choose to ignore the opportunities for growth that exist within a district.

E) Experiential versus Objective knowledge

During the course of one interview, a respondent shared the details of a divestiture that her company was recently involved in. The parent company developed a product that had commercial potential but did not fit with the core business that the company was pursuing. Decisions surrounding the divestiture of the product took into account both the economic well being of the company as well as the personal comfort of all the parties involved. They realized that in addition to selling the technology, they also had to divest themselves of the team that worked on the product. She remarked that while technology on its own might get you to a marketplace, it is not enough to make you competitive once you get there. You must continue to develop, maintain, support and sell the product. The ability to undertake these functions are embedded in habit, routine and are the unique possession of the individuals who worked on the development of the technology that was being sold. Adopting the vernacular of Edith Penrose (see chapter two), the team that worked on the technology possessed the experiential knowledge that was needed to sustain the product. Driven by a strong commitment to its employees, the company did not want to upend and uproot people from a C.T.T.-centred environment that included their family, friends and everything else that exists in a private life, and put them in another city. Consequently, when the parent company undertook the sale of the product, it sought a local buyer. Such a company was found and it was described as "perfect serendipity". The parent company found a buyer that it knew and trusted. At the time of the first wave of interviews, the parent company remarked that even though it had legally divested itself of the technology and transferred licenses to the new company, it was temporarily housing the complete team of people who work on the product at its office tower.

This kind of collaboration is above and beyond what any other set of companies can do because of the absolute trust that the companies have in each other. Even though the team is no longer employed by the parent company, it walks through the halls, has lunch in the kitchen where employees will inevitably *talk shop* and are basically privy to anything that goes on in the parent company's office -- in fact, they continue to be connected to the parent company's network. This was done to ensure the continued viability of the product and to provide assistance to a colleague who was in need of assistance.

F) Plus ce Change - Plus c'est la Même Chose

According to the interview that was conducted in the winter of 2000, the area has continued to demonstrate the same resilience and commitment to community development that it demonstrated in 1995. While the substance of their relationships with one another and their participation in formal and informal local associations continue to exist, the actual business landscape has undergone a number of changes. The C.T.T. representative emphasized that these changes have in fact reinforced and revitalized the positive trends that were uncovered in 1995.

A growing number of local homegrown companies are now traded on public stock markets. There are 50 local companies that are currently traded on the Toronto Stock Exchange. While this has had the effect of increasing the capital available to the companies and made the individual companies responsible to a Board of Directors, the substance of their relationships with employees and other colleagues in the region has remained the same. While the companies obtained more money to pursue their business interests and extend their product lines, they simply continued to engage business in the

same manner that they were accustomed to and did not radically alter to substance of their internal and external relationships. It was explained that the formula for success had already been established and that newly traded companies continued along the same path that they were on before. Failure to do so would not only disrupt the symbiosis of the community but could potentially have a deleterious effect on the business itself. The outbreak of IPOs (Initial Public Offerings) has had a positive effect on the community as a whole. It was remarked that the successes met by companies who have obtained a spot on a public market have provided other companies with increased confidence. The respondent commented that the area has a certain "brashness" that it did not have before.

A number of the big companies, including multi-national companies with local branch plants, expanded their local investments. Harrison's concern that a multi-national company will disturb the balance of relationships in a community has not come to fruition in C.T.T. During the first wave of interviews, an executive employed by one of the multi-national companies explained that part of the rationale for locating in the area revolved around the industrial atmosphere that envelopes the community. A Wilfrid Laurier graduate himself, this executive was an active participant in the industry associations in the community and indicated that he was an advocate of the community within the organization. While the impact of this individual on decisions taken by the multi-national company cannot be directly determined, his approach to business underscores the success of the efforts undertaken within the region.

In addition, a significant merger between a university spin-off company and a large U.S. based multinational company was underway at the time of the first wave of interviews. Some respondents during the first wave of interviews regarded this merger

with skepticism and were more inclined to call it a "take over" than a merger. However, the new business arrangement has had a positive effect on the community. The company itself continues to exist in C.T.T. and its relationships with local suppliers and local institutions are largely unchanged. More importantly, the company has assumed the role of conduit between the region and its parent company. It provides companies in the area with easy access to the expertise and resources of the multinational company. It is another source of information in the community.

F) Highlights of the Study

The key findings of the study include:

- A sound global economy supports the output of C.T.T.
- The innovative pursuits of companies provide C.T.T. with a competitive advantage in the international marketplace
- Support for the innovative pursuits undertaken by companies in C.T.T. are derived from
 1. The non hierarchical structure of the firms themselves
 2. The incorporation of clients in the production process
 3. Relations with like-oriented companies in the district
 4. Industry and government sponsored associations
- Success within the region is partly attributable to access to business services and business information within the various networks (i.e., access to venture capital, specialized accountants, patent lawyers, and industry associations)
- A cooperative framework has evolved in C.T.T. that can be referred to as co-opetition
- In spite of the presence of large companies, small firms propel growth and encourage diversity in C.T.T.

SECTION 5: CONCLUSION

While local entrepreneurs recognize that something is different about business in C.T.T., they do not consider their business practices to be radical departures from the activities of their competitors in other parts of the world. In fact, one respondent was quick to dismiss the importance of the network of businesses to his company's financial success. But the reality is that without the constructs that comprise C.T.T., his own business would look wholly different than it does today. He remarked that there is nothing special about the community, he could just as easily set up his business in Goderich where he explains he might even enjoy a better lifestyle. However, the expertise of the local accountants and lawyers who specialize in the computer industry have made conducting business in C.T.T. easier than operating his business from Goderich, per se, and he has ultimately chosen to make C.T.T. his company's home. He has been involved in C.T.N. and as a direct result, he has obtained a contract valued at \$10,000 per year and has enjoyed the benefits of the formal and informal structures that promote and sustain business in the community. However, he maintains that he could leave the community tomorrow and his company would find other means to exist. He might be right, but this does not undermine the success and the merits that are derived from participation in a small business network where individual companies collectively benefit from one another's experiences. It is important to acknowledge individuals such as this entrepreneur, because his attitude belies relations in C.T.T. where the apparatus for promulgating business are invisible to some participants and is simply accepted as a regular course of action for businesses.

Information is a critical component to the regional economy's success. The networks that distinguish C.T.T. from other attempts at regional growth are important to the extent

that they can provide participants with access to timely, accurate and useful information that will help each company grow their individual enterprises and in turn increase the international profile of the community. This has required the architects of the C.T.T. to set up systems which encourage its participants to leave their fears about sharing information at the city boundaries and embrace the collective esprit that has flourished into Canada's Technology Triangle. This has involved appreciating that the world economy is a different environment today and that it is driven by the logic of flexible specialization. One must accept that the instruments that were successful during the hey day of Ford and Carnegie are no longer applicable. They have had to allow transformative effect of information to permeate and take hold of their day-to-day business affairs through the network-based industrial system advocated throughout this thesis.

Chapter Four

POSSIBILITIES FOR THE FUTURE

SECTION 1: INTRODUCTION

This thesis project has focused on diverse theoretical observations of information and local development and data derived from a study of a local experience in southwestern Ontario. Chapter one provided a brief sketch of industrial history and particular attention was paid to the factors and concerns surrounding the move toward a more flexible business environment. The chapter also explored the possibilities for regional growth based on the industrial district model. Among the criticisms launched against the industrial district model for development, detractors warn of disparate development, the weakening of working class politics and the overall instability of a locally focused experiment. In spite of the criticisms that have been lodged against the system, this thesis has shown that by casting aside neo-classical economic constraints and moving toward an evolutionary approach to economic behaviour, sound local economies can prevail. However, the success of such systems is limited to the point that they can accommodate information. Chapter two addressed information and advanced that an evolutionary system that is infused with information can help meet the demands that Fordist models have difficulty responding to. Central to the evolutionary approach is the recognition that, "change is not to be interpreted as a response to exogenous changes in data but rather as change which occurs endogenously without reference to adjustment or some equilibrium state. This entails a shift from perceiving competition in terms of price to viewing competition in terms of those decisive cost and quality advantages which arise from innovative behaviour (Metcalf, p. 27)." In chapter three, these concepts were

explored in the context of the regional experience of Canada's Technology Triangle. This study demonstrated that information, a hitherto underused entity, must permeate the entire business process. From this analysis the tangible benefits of a locally based communicative project became evident. Further, this research presented an opportunity to develop a communicative approach to local development.

However, to simply paint a picture of the status quo falls short of being useful to policy-makers and analysts who must grapple with questions of economic development on an ongoing basis. This thesis concludes by addressing the following three questions:

1. Can the relations traced in C.T.T. and found in other industrial districts be reproduced?
2. Does the policy maker need to pay attention to the particular idiosyncrasies of the high technology industry when attempting to develop a high technology industrial district? -- Or do the same rules that apply to a furniture district apply to a high technology district?
3. What are the possibilities for the future?

SECTION 2: CAN THE RELATIONS BE REPRODUCED?

While it is important to understand the dynamic of a local experience, the prudent policy maker strives to understand how one can replicate the positive relations uncovered in certain areas in other locales. In this regard, skeptics claim that while an industrial district can be described, it cannot be replicated because each positive circumstance "depended on an improbable chain of fortuitous local circumstances (Sabel, p. 216)." In particular, critics cite the rich history of social solidarity found in Emilia Romagna that was manifested through trade unions, co-operatives, mutual aid societies and support of the Socialist Party (Leonardi et al., p. 7) when they explain the success of its industrial district model of development.

Among those who cannot foresee the wholesale import of local experiences to other regions is Robert Putnam. In order to provide an empirical basis to the understanding of democratic institutions, Putnam conducted a study on the regional experience in Italy. His research is situated within the tradition of the new institutionalism. The new institutionalism posits that institutions shape politics and history shapes institutions. Putnam conducted a longitudinal study that spanned three decades to investigate the people, history and institutional performance of the twenty Italian regions. The study adopted a two pronged approach. In the first instance institutions are treated as independent variables as Putnam examines how institutional change affects the identities, power and strategies of political agents. The second component of the research treats institutions as dependent variables as Putnam questions how the institutions themselves have been conditioned by history.

His study is especially relevant to this thesis project for two reasons. Primarily, the industrial district model of development that this thesis is studying has met tremendous success in Emilia-Romagna. Putnam's analysis explains how the system has been sustained over the years. Secondly, his empirical research uncovered various correlations between different elements that exist in industrial districts. These suggest various landmines that might meet those attempting to replicate the dynamic that he traced in the area that he refers to as the Third Italy.

Putnam ultimately concludes that a region's institutional success is determined by the extent to which it has enjoyed a rich history of civic involvement. The extent to which governments can successfully direct local economies is a product of the degree of civic activity that has transpired in the area over time. This is a grim conclusion for Southern

Italian leaders who are being told that the potential for their regions to overcome their economic malaise will not be determined on the basis of structural adjustments that they undertake, but was determined centuries ago by leaders who imposed hierarchical relations in the area and hence precluded civic traditions from taking root in the south. He also believes that the long-term effects of past actions are irreversible (Putnam, p. 183). He explains that "where norms and networks of civic engagement are lacking, the outlook for collective action appears bleak (Putnam, p. 183)."

An historical account is useful to the extent that it allows one to place an area into its context; however, one cannot fall into a trap where history is given the power to determine the present. A specific wrinkle in Putnam's analysis occurs when he compares the regional experiences of Calabria and Emilia-Romagna. Putnam does not explain why it took 80 years for the civic tradition to influence economic output in Emilia-Romagna (Putnam, p. 154). If civics predetermines economic output, one might argue that the economic differences between the two areas should be as ancient as the civic traditions themselves.

Supporting Putnam's observations, critics of the industrial district model are quick to indicate that while there are a number of successful districts around the world their dynamics cannot be reproduced (Amin and Robbins, 1990). They tend to highlight the specificity of the regional context that encouraged the growth of districts. However, there are a growing number of analysts who do not accept this philosophy. Instead, they posit that with the appropriate forms of government intervention and the active cooperation of participants, the model can be extended to backward areas and encourage development and growth.

These analysts do not generally deny the link between economic success, social structure and political institutions. Rather they envision a situation wherein each factor is a mutually constitutive feature for the others and that they are each extendable to other regions.

Among the optimists for the future development of industrial districts is Charles Sabel. Central to Sabel's understanding of economic behaviour is trust. Effectively, trust is a component of the industrial atmosphere that has been shown to have a positive impact on the regions explored throughout this thesis. He explains that in a volatile economic environment where agents are collaborating with one another in the production of highly specialized products, trust has become a precondition to their economic activity. Without trust, economic agents would refrain from dedicating the requisite resources to the development of a product and all economic activity could cease. In regions where such trusting relations are prevalent, economic "actors regard their mutual confidence as a natural fact, as much an expression of their way of life as their language, and no less resistant to political direction (Sabel, p. 215)." Alternately, the agents of a firm where business relations are characterized by mistrust and universal suspicion view their habits as unalterable realities that developed over time.

Sabel does not partake in either of these fatalistic persuasions and the axiom of "history as destiny (Sabel, p. 217)." He views trust as a precondition of social life. Therefore, it is not about creating trust, but it is about determining how individuals come to see others as trustworthy. He believes that trust can be uncovered based on the premise that it is a constitutive feature of life and consequently can, in principle, be extended. Sabel sets out to explain how persons or relations can come to be seen as

trustworthy. Through a renewed understanding of trust, he demonstrates how a government can play an active role in economic development.

The immediate question that follows from Sabel's interrogation is, *if not through historical properties, then how do the qualities of civic life become embedded in a people so as to encourage positive economic and democratic relations?* Sabel points toward the sociological view of personhood. It demonstrates how a new understanding of relations can lead to the success of cooperation and the development of successful economic policy. It rests on the fact that "persons are constituted or can constitute themselves only in society (Sabel, p. 220)." Essentially, the self is defined hermeneutically. The individual is a part of the collective group norms that constitute 'society'. This means that the individual's 'culture' (i.e., trust) can be determined by the set of relations from the 'collective' that the individual uses to define his/her personal credo. His view asserts that "so long as social life is possible, the realm of trusting behaviour can always in principle be enlarged by extending to new realms the shared understanding which makes sociability possible in the first place (Sabel, p. 221)." The reflexive self is consequently prudent and other-regarding, because, in part, it knows that others share its inclinations. Consequently, when policy makers and collective entrepreneurs recognize the need for civic relations, the cooperative and trusting relations will not be undermined by their past, but rather a newly defined collective identity will allow successfully trusting relations to follow (through 'genesis amnesia' -- described below).

The dilemma one is struck with when working through Sabel's framework is determining where the will to create this new 'collective' comes from and how it can be accomplished. If one is initially constituted through the existence of a whole, how do

new entities become a part of the whole unless the individual (or collectivity) places it there? Perhaps self-interest is the driving force of the economy. In accepting this principle, one can now understand that the collective 'will to trust' is the resignation by the self-interested individual that in order to survive individually, one must allow the whole to succeed. In the interest of potential long-term gain, individuals are willing to risk betrayal. However, this amounts to cooperation on the basis of a calculated self-interest and erroneously conflates trust with cooperation. This system is prone to crisis because the motivation of the initial activity is not the collective, but resides in the individual. This might lead to an economic stalemate, as people will refrain from economic activity for fear of being on the losing end of a 'trusting' relationship.

He has coined the term 'genesis amnesia (Sabel, p. 225)' to explain how an industrial district model for development can be replicated in diverse social and historical environments. He explains that in accounting for economic activity within an area, inhabitants create stories about their pasts and ultimately reinterpret/rewrite their own histories to make trust (a component of civics) seem inevitable, natural and eternal (i.e., the strong civic allegiance since Medieval times has been consistent and conflict free and is the basis for explaining current relations in Emilia Romagna; respondents in the study undertaken for this study explaining that they trust one another because they share a common experiences). Sabel explains that trust depends on how individuals reinterpret their collective past and conflicts and tell stories that make trust and cooperation seem natural and inevitable components of an area's history rather than parts of a forged identity created in the interest of economic success. Sabel notes that "it is not us outsiders but themselves that the tellers of these stories aim to fool: and it is no fault but

our own if their efforts to induce a kind of genesis amnesia in themselves lead us to believe that their history was actually without conflict (Sabel, p. 226)." Although not directing his comments at Putnam, Sabel's warning applies to him and others who search the histories of economic units for the key to their successes. It is the goal of the policy analyst to delve beyond the mythic stories and realize the role of ideology through the state, and collective action in providing the basis for formidable civic relations and, according to Putnam, the economic success that flows from them.

The marketing materials generated by the individual municipalities that comprise C.T.T. possess traces of the story telling that are important to the identification of the region and the promulgation of further development. In particular, the community of Cambridge's marketing material is replete with references to a history premised on dynamic growth and suggests that the region will naturally continue along this path of development. The brochure reads, "this booklet is intended to salute our pioneers. It is through their spirit that we have had a productive history and even more important a bright, rich future (*The Community of Cambridge*, p. 1)." It further cloaks itself in the vestiges of antiquity by interspersing black and white photographs taken in the 19th century with current colour photographs. The brochure also boasts business accomplishments achieved in 1850 and a series of other successes that the area has enjoyed in the last 150 years. The underlying message that the photos and the language used in the brochure communicates is that development and growth are innate products of Cambridge's business landscape and serve to ensconce the sentiment that the rich heritage in itself assures future development.

In addition, the rich German heritage and the work ethic that respondents explained flow from this cultural background are ill founded as most people in the community indicate a British heritage. However, this does not prevent the towns of Kitchener and Waterloo from hosting an annual Bavarian Oktoberfest. Consequently the myth of the hard working German heritage continues to be propagated and interpolated into the collective identity of residents. On first brush, it may seem trite to suggest that because the residents believe that they partake in a German heritage that they are consequently capable of making huge economic strides. However, the data collected for this study suggests that people explain their own success and in turn reinforce the work dynamic that such a mythology supports.

By learning to cooperate, Charles Sabel maintains that, "in coming to a common, and generally surprising view of an economic situation which each thought it had understood fully, mutually suspicious groups can redefine their relations and (prudently) begin to construct communities of interest (Sabel, p. 230)."

In the same vein, Leonardi and Nanetti explain that in the case of Emilia Romagna, a political maneuver can instigate the same relations. They explain that "the success of the economy has reinforced the rationale for the social solidarity that went into the creation of the social and economic infrastructure (hidden costs), which were taken on board by the political community. Thus, the activities of the region have confirmed the advisability of the relationship between the social structure, political institutions, and the economy (Leonardi et al., p. 7)."

Upon a recognition of the sociological basis for forming collective identity, it is possible to appeal to referents in the recollected experience through what Sabel refers to as "studied trust" where the community interest is redefined and can truly become a part of the individual and collective philosophy.

Having established the potential to replicate the eternal sentiments of the industrial district model, policy makers should keep in mind that just as there are a myriad of permutations of the industrial district around the globe, one need not pursue the wholesale import of a particular success story. Instead, by focussing on key elements, policy makers can support yet another variety on the theme of the industrial district.

SECTION 3: IS THERE A DIFFERENCE BETWEEN HIGH TECHNOLOGY-BASED AND OTHER INDUSTRY-BASED INDUSTRIAL DISTRICTS?

A) Similarities

Before contrasting the high technology experience that was uncovered in C.T.T. with other industrial districts, it is important to underscore the essential characteristics of industrial districts that persist regardless of the industry being pursued. First and foremost, the text book industrial district must be defined by a geographic region. However, geography alone is not a sufficient factor in the complete evolution and success of industrial districts. It is the industrial atmosphere that prevails in a community that determines an industrial district's success. The enduring characteristic of an industrial district is found in the actual organization of relationships between firms and to a lesser extent, the internal organization of a company.

As Werner Sengenberger and Frank Pyke explain, the specifics of an industrial district may vary at the margins, but the social and economic interdependence of small

firms engaged in the same industrial sector define the industrial district model. Through interdependencies, a trusting and cooperative approach to business evolves whereby companies are able to achieve various economies of scale and scope that are unimaginable to an independent small firm and unrealistic to the large firm. In addition, the mechanisms/institutions that are put in place to sustain these relations and encourage the existing dynamism are central to their growth and development. Sengenberger and Pyke also remark that the most successful districts compete on a range of items, and not just price.

Also important to the industrial district is the active participation of the labour force. In the industrial district model, labour is not a factor of production that can be replaced by another entity. Rather, labour possesses the experiential knowledge required to sustain the growth of a district. Labour plays an important role in the success, vitality and growth of the industrial district. In a discussion on the growth of the small firm in an industrial district, Sengenberger and Pyke explain that policy makers have two options available to them. Under an approach termed the 'low road', the destructive path of deregulating the labour market, relieving small firms of industry-wide standards and the provision of tax privileges is pursued in the name of enhancing small businesses' competitive positions. It is assumed that these actions will increase their flexibility and enhance their ability to compete internationally. Counter to this objective, this approach has typically led to poor wages, decreased efficiency and further cost cutting (Sengenberger and Pyke, p. 12). This has in turn had a detrimental affect on the entire industrial district model.

Alternately, a system that has been termed the 'high road' can be employed to enhance innovation and efficiency. The primary policy instrument of this approach is the application of strong labour standards. Through enhanced labour standards, the downward cycle of wage competition will cease and "constructive competition through cooperation and its sub-processes of participation, joint resource utilization, and joint conflict resolution (Sengenberger and Pyke, p. 13)" will materialize.

It was important to raise this issue of labour at this point of the discussion because policy analysts are often captivated by the intuitive promise of increased profits that the 'low road' suggests. In order to entice small business start-ups governments might try to tempt them with savings by relaxing their labour codes. This will have the opposite effect. Studies have demonstrated that through the vigorous protection of labour, small businesses and industrial districts can truly succeed. To pursue the 'low road' is a short sighted and ill founded policy approach that will not sustain long term development.

These defining characteristics transcend industries and are as much a part of Emilia Romangna's success as they are to the success achieved in CTT.

B) Differences

The differences that this thesis will now explore are actually differences in degree rather than kind. That is, while industrial districts all require the existence of strong networks, the policy maker must pay attention to the particular brand of network that is required in the high technology sector.

i) Networks

Networks are essential to cross-fertilization across companies and ultimately allow regions to meet the challenges of international competition. According to J.S. Metcalfe, networks "fall within the perimeter of non-market devices by which firms seek to coordinate their activities with other firms and with other knowledge generating institutions (Metcalfe, p. 40)." Whether a local experience is being forged in the area of high technology or another industry, the infrastructure and linkages must produce economies of scale and scope that are exterior to the individual companies but internal to the district.

While the objectives of the networks are consistent across industrial lines, their substance varies across sector. In the spirit of the traditional Marshallian industrial district, companies in the Third Italy are engaged in different stages of a production system and the entire area collectively produces a specific product (i.e., ceramics). In this regard, the supplier chain is at the heart of the region's successes.

Alternately, within C.T.T., the genius of the collective experience is found in the linkages that enhance the individual abilities of companies and in turn contribute to the dynamic of the entire business community. Within C.T.T., there is an appreciation for the accretive process of high technology development. Consequently, measures have been put in place that will bolster business synergies and ultimately result in the development and adoption of new products. In addition, cooperative research and development initiatives between the universities and private companies are pursued in the region. Companies in C.T.T. also provide extra-production support to one another. That is, as outlined in chapter two, there are formal and informal means by which the

companies impart information to one another about the international business milieu and share industry-specific information with one another. In C.T.T., companies do not band together to produce a product as they do in the creation of ceramics or textiles in the Third Italy. Rather, they combine their collective know-how on an on-going basis to generate ideas, solve problems and lend one another business support.

In the case of the textile industry in the Third Italy where a wide skill set is required along with discrete operations that each require specialized machinery, it becomes necessary to facilitate inter-business cooperation and the provision of services that will help sustain these pursuits. Alternately, if the industry being nurtured contains mainly stand-alone enterprises (i.e., software development), it becomes increasingly important to foster a cooperative milieu wherein the creative juices of development can be nurtured. In these cases, particular attention must be paid to the external economies of information and communication (to enhance learning) and economies of labour (to ensure that a resource of trained labour is available).

ii) The Innovative Process

While policy makers must nurture the appropriate network to sustain high technology growth, their policies must also appreciate the unique circumstances that surround the innovative process. It is insufficient to simply set up associations to facilitate the cross-fertilization of industry. In particular, a local economic office that simply acts as a clearinghouse for information will also fall short of its goals. This section will dissect the innovative process and the factors that distinguish innovative pursuits in the technology sector from other businesses.

The traditional policy imperative is to provide a means to supply what the market, left to its own devices, will not provide. In particular the policy maker must create an environment wherein those resources that are under-supplied in the typical marketplace will become available.

In an attempt to establish a framework for development and specify the institutional requirements to facilitate innovation in the technology industry, J.S. Metcalfe explains that progress in the technology industry is driven by the variable behaviour of high technology firms. The policy maker should devise a means of encouraging this variable behaviour and encourage inter-company relationships. Metcalfe points the policy maker toward the evolutionary approach to technical change that was described in chapter one. He defines evolution as both the cumulative unfolding of an entity in a path dependent manner as well as the creation of change through an emerging structure that is advanced by variety in behaviour. Metcalfe adds that from the perspective of the technology policy maker, change has three distinct permutations and phases. These permutations include the evolution of genuine novel items (i.e., new design configurations), the internal development of existing design configurations (i.e., a sequence of innovations) and the commercial success of one product over another in the competitive marketplace (i.e., the adoption of a product by consumers).

Metcalfe surmises that unaided, the market will not allocate the requisite resources to generate and encourage innovative behaviour within the high technology sector. He explains that inappropriate incentive mechanisms or the imperfect distribution of information across economic entities circumvents the market from providing the necessary resources. As explained in chapter two, the limits of neo classical theory force

economic agents to view exchanges in the crass terms of monetary value. Ensnared within this traditional approach, the balance of technology policy has been concerned with restoring the state of equilibrium and correcting for market failures. However, these typical responses of government are ill suited to the technology sector because of the unique patterns of growth that characterize development and the unique composition of technology markets. Bound by these restrictions, the policy maker compounds the problems that technology faces and re-inforces the dominant role assumed by neoclassical doctrine. This places the policy maker in a quandary.

Metcalf explains that the development of technology is predicated on future demand. This makes it impossible for economic agents to determine the monetary value of their individual contributions to the final outcome. This occurs because the return on their investment cannot be determined and the relative value of their contribution cannot be surmised until the product has evolved and established a commercial market. Ultimately, economic agents may choose to withhold their resources and the evolution of technology will cease. Consequently, the policy maker must ascertain how to form expectations of the possible private value of any exchange that is undertaken. Metcalfe explains that,

future markets for contingent claims in an uncertain world do not exist in any sense sufficiently for individuals to trade risks in an optimal fashion and establish prices which support the appropriate marginal conditions. Because the appropriate price structure is missing, distortions abound and the policy problem is to identify and correct those distortions (Metcalf, p. 26).

Exacerbating this problem, the innovative process is predicated on asymmetric knowledge and consequently is fundamentally incompatible with a state of equilibrium and the classical definition of efficiency. Because the relative value of one resource vis à

vis another cannot be determined until the successful completion of a new product, it is likely that some resources will not be used in the ultimate creation of a product.

However, the failed attempt to use the resource ultimately contributes to the evolution of the final product and is consequently of material value. This means that it is inappropriate to conflate efficiency with efficacy. The policy maker should create an environment wherein participants realize the benefits of casting aside the traditional notions of efficiency and those decisive cost considerations that typically govern one's decision to devote resources to a particular enterprise must be abandoned.

The policy maker can stimulate the innovative capabilities of the economic system by changing the incentives of business relations. Metcalfe explains that policies should be directed at, "enhancing the learning processes in firms and other institutions to generate variety in behaviour (Metcalfe, p. 28)." Attention should be paid to those endogenous changes that prompt change rather than the attainment of a state of equilibrium. He remarks that for the evolutionary policy maker, "process and change, not equilibrium and state are <the> central concerns (Metcalfe, p. 30)." He concludes that technology policy should focus on the "co-evolving" technological and market environments and not the success or failure of individual innovations.

While Metcalfe's solution is embedded in a national system of innovation, the industrial district model can also prove to be an ideal Petri dish within which the dynamic can be examined. Formal and informal networks that facilitate innovation are omnipresent in successful industrial districts. Each of these networks facilitates the promulgation and diffusion of information and in turn contributes to the extension of knowledge and the creation of new products.

SECTION 6: LOOKING TOWARD THE FUTURE

There has been a shift in the range of activities that citizens are willing to support on behalf of their governments. In the past, the government fulfilled a redistribution role. Local government in particular pursued social policy and assumed an interventionist role in the economy. Given the general shift of the political spectrum to the right, these actions are becoming less and less feasible and increasingly inconsistent with the priorities and objectives of regional and provincial governments (in particular in Ontario). Consequently, governments need to adopt a strategy of active stimulation of economic and social conditions that will ultimately support development.

According to Sebastiano Brusco's analysis of small firm development in Italy, there is an important role for government to assume in the promotion of the industrial district model. Although his analysis is limited to the Italian experience, he offers advice that appears to be relevant to Ontario as well. His contention is that the evolution of international markets and the importance of technology have changed the business landscape. He explains that these changes have made it important for companies to have access to "real services" (i.e., information about changing markets in Slovakia (per se), assistance in bidding on a tender, etc.) that might be provided through government (Brusco, p. 11). At the end of his paper, he also questions if centres designed to provide "real services" can entice positive industrial relations to evolve in depressed areas. It would appear that this course of action would be consistent with the priorities of Ontarians and their local and provincial governments.

In fact, Nicola Bellini, Maria Grazia and Francesca Pasquini make reference to an opinion that is growing in popularity. It holds that existing business can be "consolidated

and strengthened through the creation of business service centres, whose main task is technology transfer and the provision of high value added specialist services (Bellini et al, p. 172)." They explain that Emilia Romagna has assumed a leading role in this regard as is evidenced by the local and industry specific agencies that have emerged in the area.

In a different vein, in an analysis of the Italian industrial district's future, Carlo Trigilia remarks that policy makers need to direct their attention to "supply policy" initiatives. That is, those policies that strengthen the systemic capacities and horizontal integration of industrial districts. However, he warns that the effective promulgation of these systems must be:

- Case specific (embedded with an ability to be flexible over both space and time)
- Possess a concentration of resources (as a consequence of the effective integration of various policies)
- Avoid bureaucratic forms of control -- alternately, encourage the input and participation of economic agents at all stages of the development and implementation processes (Trigilia, p. 43)

The extension of the industrial district model as a tool for economic development cannot be reduced to economic policies. Rather, the entire gambit of activities that constitute the industrial atmosphere must be considered. Trigilia clarifies that policies must be directed at creating those social actors that ultimately provide cohesion to the district. He maintains that, "it is no accident that, as we have seen, districts are concentrated in

regions where the institutional context encourages co-operation and horizontal integration between firms (Trigilia, p. 44)."

The research undertaken for this thesis supports the finding of other analysts who warn against the adoption of various financial incentives as a tool of economic regeneration (Allen and Levin, Trigilia, Pyke and Sengenberger (1990), Pezzini, Brusco). These types of incentives include subsidies, tax exemptions, aid to technological improvement, and the relaxation of social obligations (such as environmental codes). In the hopes of helping firms overcome financial constraints, these incentives are targeted at individual firms and do not stimulate the type of collective environment that is required in an industrial district. Critics also point out that the inordinate amount of paper-work and additional accounting required to obtain the grant are a disincentive to the small firms that are being targeted. Consequently, large firms with the administrative and financial wherewithall to absorb the encumbrance of the additional work are the sole beneficiaries. In addition, these types of incentives are often implicated for extending the life of an otherwise perilous business venture and are another guise for political protection. That is, they encourage enterprises that could not otherwise be sustained by the market and that generally do not serve a greater community benefit.

Policy makers should direct their attention toward those interventions designed to strengthen and create the types of horizontal integration between companies that exemplify the successful industrial district. This is because the problem with the small firm is not that it is financially deficient. Rather, it is its isolation from other companies (Pyke et al, 1990, p. 4). The focus should be on those external economies that have lent to the success of regional experiences in regions as diverse as Silicon Valley, Emilia

Romagna and Canada's Technology Triangle. In particular, Trigilia highlights the importance of encouraging the creation of collective goods. These include the spread of technological expertise, the promotion of trade along with business and worker skills training.

Trigilia points out that while this approach can provide the necessary tools to enhance the economic output of an area that possesses the basic components of an industrial district (i.e., like-oriented companies situated in a geographically defined area), it falls short when the model is applied to an area where companies are engaged in disparate economic pursuits. He explains that while "these resources may facilitate the adjustment process undertaken by already existing districts, it is doubtful that they would suffice for backward areas (Trigilia, p. 45)." He further elucidates that the main economic barrier in depressed areas is their inability to trust one another and their inability to achieve the business synergies that would spur positive economic outcomes in the industrial district.

As a consequence, he points the policy maker toward more complex forms of economic intervention. In particular, he discusses the possibility of local or regional governments assuming an aggressive role in the application of industrial district principles that encourage linkages between companies. These would include the provision of services that would promote cross-fertilization and provide access to the tools necessary to the development of innovative products. These services are akin to the collective service centers that Michael Best found in Emilia Romagna. He explains that while the region's competitive advantage was premised on innovation and flexibility, companies could not negate the importance of marketing and competitor analysis to their ability to remain competitive. However, their inability to individually obtain those

economies of scale required to sustain these functions threatened to undermine their long-term success. Consequently, it was incumbent upon the local actors (private and public) to devise a system that allowed them access to both marketing and technological information. Guided by the ideas that information is a public good, industrial district centres were created that offered collective services, in particular, those concerned with informational activities (Best, p. 218-219). By way of example, CITER (Centro Informazione Tessile dell'Emilia Romagna) is a collective service centre for those operating in the textile and clothing industry. The organization provides its member firms with information on fashion trends (through meetings, publications, video presentations and consultations), marketing (whereby participants have access to information about market needs) and technology (by providing access to the computer-aided design systems (CAD) that are required to be competitive).

The need to replicate these centres is important. Best points out the three pillars that support the centres in Emilia Romagna. The prudent policy makers should bear these notions in mind when devising a local solution themselves. He explains that: first, the centres must be sector-specific (because the challenges and opportunities that face each sector are unique); second, the centres must be located in close proximity to the industrial district itself (i.e., in the same municipality); third, the centres should provide generic information that facilitates the individual firm's activities as opposed to providing firm-specific resources (Best, p. 219). Essentially, the centres are responsible for providing information but the manner in which information is adopted and applied should vary based on the company that obtained it. Should the centres exceed this limited but centripetal role, they would be encroaching on the individuality of the member

companies and ultimately destroy the innovative and creative capacity that engenders success in the industrial district model. Trigilia points out that in Italy, the importance of a solid local institutional context along with a well-organized and autonomous civil society have spear-headed the growth of industrial districts.

However, local governments in depressed areas are often ill equipped to sustain the level of institutional involvement required to sustain an on-going attempt at regeneration. Due to the incompatibility of centrally planned solutions to the indigenous growth of local economies, Trigilia highlights a possible course of action. In his vision, the strengthening of local institutions and the enhancement of civil society go hand in hand. He specifies that it is necessary "to stimulate the creation of strong interlocutors within civil society. Organizations representing different interests need to be reinforced by institutional means and their role in the design and implementation of new policies should be enhanced (Trigilia, p. 46)." These interlocutors are critical to the vision being advanced by Trigilia, and in fact by this thesis, and are central to the prospect of transplanting this economic vision to different locales.

SECTION 5: THE INDUSTRIAL DISTRICT MODEL REVISITED

The success of industrial districts around the world have inspired analysts and politicians to examine the nature of the relations that have evolved in these pockets of industrial dynamism in the hopes that they can borrow and replicate the formulae of their successes at home. Many local economic development offices attempt to entice high technology companies to their locales because they believe that they can provide a solid basis for long-term economic prosperity and a plethora of desirable jobs for the citizens of the region.

Sengenberger and Pyke remark that the economic success of these regions and their ability to penetrate international markets have focussed the world's attention on their composition and form.

In addition to the desire to replicate the wealth of these regions, the industrial district model should be studied for other reasons. Werner Sengenberger and Frank Pyke cite three reasons to advance the study of local industrial districts and the question of local economic regeneration.

The first reason is related to the overarching shift in patterns of consumption and production. They remark that, "industrial districts are emblematic of the profound industrial restructuring which we have been able to observe in virtually all industrialized countries since 1975 (Sengenberger and Pyke, p. 6)." As the world economy undergoes a major shift because of the saturation of mass markets and technological advances in production techniques, policy makers are combing the world to find successful patterns that they can adopt to generate growth. The industrial district's focus on small companies banding together to compete in a flexible environment has captured the attention of analysts.

Secondly, they believe that industrial districts provide policy makers with a progressive model for development. In a pursuit to uncover industrial strategies and forms that can enhance labour standards, they have uncovered trends in industrial districts that suggest that these standards can be elevated under the industrial district model. On this basis, it is important to further study the industrial district model because it may "combine economic targets, such as efficiency and flexibility, with social targets

such as good pay and good working conditions, participation and equity (Sengenberger and Pyke, p. 7)."

Thirdly, they believe that the study of industrial districts is important for the lessons that they teach about the ingredients for development. Such as the promotion of "balanced and sustainable development (Sengenberger and Pyke, p. 7)."

In sum, the industrial district model is a valuable site to study for both the economic success that it might provide as well as the overall social organization that accompanies it. Sengenberger and Pyke explain that industrial districts "lead us to emphasize such things as non-hierarchical organization, autonomy, cooperation, local and regional networks, competent entrepreneurship, an differentiated industrial structure (Sengenberger and Pyke, p. 7)."

The industrial district system being advanced in this thesis is anchored in evolutionary economic theory and necessitates an holistic approach to economic development. The changes in the world economic order have necessitated a move away from the equilibrium theories that have dominated development in the period of mass production and Fordism. The existing literature concentrates on the nature of the competition and the innovative capabilities of individual companies but pays little attention to the trade-off and substance of how to make the theory materialize. Using the industrial district as a Petri dish, the thesis has attempted to trace those relationships and networks that sustain the evolutionary model. In this regard, this study has uncovered a number of essential characteristics to the success of a local experience. They include,

- The industrial district model uncovered in C.T.T. derives benefits from being locally embedded, but globally connected
- While the firm is the locus of activity, the overarching local environment (referred to as the industrial atmosphere) determines the success of economic pursuits in C.T.T.
- The industrial atmosphere is the generator and "active agent" to the economic renewal that is underway in C.T.T.
- Partnerships between economic entities sustain systems of innovation

SECTION 6: FURTHER STUDY

The primary focus of this thesis has been detailing some elements of an economic model that will assist business in grappling with today's business environment. Given this focus, an important question has gone unanswered. In spite of the economic success and positive work experiences that active participants in C.T.T. enjoy, we do not know what has become of those who lack the skills or the intellectual where-with-all to engage in the high technology sector that is predominant in C.T.T. At first glance, the economic spin off activity in other industries appears to provide a range of opportunities for those who are left out, but this area needs further study.

SECTION 7: CONCLUSION

This thesis has presented the industrial district as one economic model for achieving success in today's flexible environment. Through a commitment to collective learning and an appreciation for the transformative effects of information, companies can band together and achieve an economic advantage over other companies in a global marketplace. Companies in C.T.T. have redefined their competitive relationships with one another and allowed a flexible approach to permeate all of their endeavors. They have left behind the binding constraints of an equilibrium framework and embraced an evolutionary philosophy wherein their growth is the product of an organic process of

reinvention. Companies have adopted an all-encompassing approach to business that includes buyer-vendor relations, interfirm associations, institutions and industrial policies. This approach can set the stage for businesses to achieve success in the current business environment.

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