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**ENTREPRENEURSHIP, INNOVATION AND DYNAMIC
REGIONAL GROWTH: THE CASE OF THE
ENTREPRENEURIAL URBAN PLACE**

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INTRODUCTION AND OVERVIEW

Entrepreneurship, innovation, and dynamic regions are terms much in vogue in recent discussions of urban, regional, and economic development issues. The popularity of these terms derives from *three* major developments in the global and regional economies in the last two decades or more.

First, under the impetus of technological change in transportation, communication, and production sectors, and the reform of international economic institutions, there has been the contemporary globalization (the increasing cross-border flows of people, goods, knowledge, and capital and a worldwide spatial organization of production in the last quarter century) -- analogous to the way in which national markets and production systems evolved from local and regional networks in late 19th Century U.S. (Chandler, 1990). The norms in most contemporary economically vibrant countries are rapidly rising international trade, foreign direct investment (FDI), and cross-border intra-firm activities which source inputs globally and support knowledge-intensive production (Drucker, 1990; Porter, 1990; Bell, 1999; Andersson, Chatterjee and Lakshmanan, 2004; Florida, 2002). In about the same period, pervasive, technical change and market evolution have led (in the industrialized countries) to a relative decline in the mode of mass production (of goods based on price competition) and a rise in the customized production mode (of goods emphasizing quality competition), quickening patterns of innovations yielding a greater variety and richness in production and consumption, and a rise of dynamic small and medium-sized firms.

Second, the ability of firms to function and compete in this worldwide web of linkages and interconnections between (large and small) corporations, public entities, and societies which make up the contemporary knowledge-intensive global economic system, requires *new structures and relationships*. These structures and relationships will allow firms and other economic agents to complement their core competencies with requisite knowledge and capacities creatively, speedily, and flexibly. While the demand for innovative knowledge-intensive products and services is growing rapidly, the emergence of such new structures and relationships (with the ability to generate and commercialize new knowledge), appears to be restricted to a limited number of regions in the world. In such regions firms (often small and medium-sized)

develop flexible and interdependent relationships with suppliers and competitors and increasingly depend on intangibles, like know-how, synergies, and untraded knowledge (Von Hippel, 1988). Such dynamic geographical areas exhibit the attributes of 'learning systems'. These attributes of learning systems, reflecting the cultures of local economic agents, derive from not only the Marshallian external economies (internal to industries), but the dynamic Jacobs' (1969) *economies of variety*. These latter external economies plus a variety of untraded interdependencies among interenterprise networks stimulate entrepreneurial economic agents (firms, public or civil society enterprises) in the region to continually create and innovate (Acs 2002; Storper, 1992, 1993; Lakshmanan and Chatterjee, 2001, 2003)¹

The third development derives from the activities of the global network corporation (e.g. Toyota, Ikea, General Electric), a major agent of current globalization and consequent economic transformation. These corporations attempt to simultaneously take advantage of a) economies of scale in knowledge, b) economies of scope in use of the corporate networks and c) variations in local market conditions and corresponding variance in local prices and wage rates. Taking advantage of recent advances in transportation and complementary communication technologies, as well as major innovations in logistical systems, network corporations concurrently exploit economies of scale and scope while maintaining production units in urban regions around the world (Sassen, 2000; Andersson, Chatterjee, and Lakshmanan, 2004).

In this context, network corporations use cities and urban regions as *organizational commodities* to maximize returns on capital. Two factors govern the choice of particular production regions or cities, and thus the global geography of production. While the choice is driven by the need to reduce factor costs, the first key determinant is infrastructure capacity in terms of integrator terminals with reliable accessibility. Global network corporations seek a combination of knowledge provision and infrastructure investment for improved accessibility. Such activities of global network firms (centered in urban areas) have two broad classes of consequences that change the environment in which cities operate (Lakshmanan and Chatterjee 2004).

The first set of consequences involves global economic competition among urban regions, where the geography of production is responsive to shifts in competitive advantage. Some urban regions endowed with global accessibility and superior knowledge stocks grow, while other smaller urban areas compete with one another for stages of production, as distributed by global

firms to exploit spatial differences in factor costs. The consequent changes in scale, composition and location of economic activities lead to changes in the fortunes of industries, cities and urban regions, as well as in life chances of urban residents --- in turn becoming a matter of policy concern for relevant private and public actors in affected cities.

The second set of consequences relate to the need for cities to adapt new roles and functions to cope with global inter-city competition. They must provide a minimum set of enabling and supporting conditions (for corporations) to meet the requirements of globalization. This typically includes: functional transport and communication infrastructure, quality urban services, skilled labor force, access to educational and recreational facilities and affordable housing. In this context, there is an emergence of the *entrepreneurial city* in the emerging global marketplace (Lakshmanan and Chatterjee, 2004). This entrepreneurial city has an increasing economic policy role as well as a redefined role for urban public goods provision — this latter function carried over from the earlier Industrial era. Further, contemporary globalization is yielding new urban patterns in the form of urban functions, policies, institutional forms and urban spatial order, which are different from urban patterns of the industrial era.

What appears to link, bring together and indeed unite these three major developments --- the transforming contemporary globalization, the emergence of dynamic open regional economies and the rise of the entrepreneurial city --- are the richness and variety of processes underlying these developments. The crucial questions are: In the emerging knowledge economy, how do knowledge advances occur? what are the underlying processes of technological, organizational, and institutional evolution? What contexts and infrastructures provide fertile ground and support for innovations --- technical and organizational? Why do knowledge-related activities concentrate in a few localities? How do some regions reinvent themselves and endogenize their dynamism? In what ways do enterprises — private, public, and other — function in these contexts? How do notions of entrepreneurship, innovation and creativity figure in this nexus?

Such questions have been explored in theories of entrepreneurship, innovation, dynamic learning systems, and endogenous growth. The theoretical explorations have, however, been focused primarily on the activities of private economic agents. Yet it is clear that economic outcomes result from the interrelated activities of private, public and civil society actors operating at many geographical and institutional scales. For instance, the appellation

'entrepreneurial' applied usually only to the private sector actor, is appropriate for the entrepreneurial city, which exhibits all the traits the literature before and after Schumpeter associates with the entrepreneurship --- risk taking, discovery, and many types of innovations --- artifacts, processes, organizations, etc. (Schumpeter, 1928, 1939, 1961; Knight, 1921; Hebert and Link, 1982; Kirzner, 1973). The entrepreneurial city seeks to identify market opportunities for private actors whose exploitation of these opportunities also serves the city's public objectives. City government becomes a risk-taker and a promoter of global competitiveness.

Many of these questions are addressed to varying degrees in *three related* broad areas of research. The first research area pertains to the *aspatial* theories on the nature and scope of entrepreneurship by Joseph Schumpeter and economists before and after him. Other theoretical formulations in this vein on the traits of entrepreneurs by anthropologists and psychologists have also enriched this literature. In addition, since entrepreneurs function and succeed in *the context* of complementary and supportive technical and organizational developments (which in effect provide an *infrastructure* of entrepreneurship), there is a variety of conceptual formulations on the *context and infrastructure* of entrepreneurship by other social scientists, such as sociologists, economic historians, organizational theorists, and economic geographers.

The second broad research area is the current burgeoning literature on *technical change and the processes underlying innovation and its geography* --- which lie behind the globalization processes, the dynamics of new industries and small and medium size enterprises, and the sustained growth and evolution of some urban areas and regions. The last two decades or more -- characterized by the rise of globally organized customized production, by the dynamics of innovative sectors (with declining half-lives of their products), and by the vitality and sustained growth of some production regions --- have stimulated research on processes underlying innovation and regional economic dynamism. Such research focuses on a) processes underlying innovation and the consequent technical and organizational evolution, and b) the geography of innovation as manifest in urban and regional growth.

The third stream of recent research, overlapping to some degree with (but distinct from) the second research area, focuses on *creativity and creative regions*. These studies broaden the scope and determinants of creativity and innovation beyond socioeconomic dimensions to include aesthetics and attitudes such as tolerance and openness.

The aim of this paper in this context is to review selectively the extensive literature in these three broad areas with two purposes in mind: *one*, to throw some light on the questions (on technical change and regional and urban economic development) raised above, by reviewing the extensive literature on entrepreneurship, innovation and creativity of private sector actors and enterprises, and *two*, by drawing upon the survey inferences to formulate a model of the functioning of the entrepreneurial public sector in dynamic urban regions in the contemporary global economy. Towards this end, theoretical notions on entrepreneurship, innovation, and creativity are presented next.

II. ENTREPRENEURSHIP AND INNOVATION

Theoretical formulations of entrepreneurship and innovation fall into two broad classes. The first class of theories, heavily influenced by Schumpeter's (1928, 1939) seminal ideas on entrepreneurship as the source of innovation and innovation as the engine of economic development, emphasize the *many attributes and motivations* of the entrepreneur. The focus of this approach (with its methodological individualism) is on the attributes of this creative entrepreneurial actor — who possesses the creativity, the business vision, the ability to assume risks and to lure investments, and the capacity to overcome resistance against innovations in order to create new products, new processes, new markets, new sources of supply, and new organizations. Such theories of entrepreneurship and innovation directed at the characteristics and behavior of individual entrepreneurs derive largely from Economics, with some contributions from Anthropology and Psychology.

The second class of theories recognize that entrepreneurship and innovations do not appear in a vacuum, but need a variety of complementary technical and, organizational developments before a particular technology is commercialized. Such supportive technical and organizational developments provide the *context or environment* of entrepreneurial activities. The context or environment pertains to factors which enhance and constrain entrepreneurial efforts, and which are embodied in what can be described as a socioeconomic and political infrastructure of innovation. Such factors promoting entrepreneurship appear in the form of prerequisites, or supportive values and institutional/organizational developments, or enabling networks and geographic structures. The disciplines which explore such contextual factors of

entrepreneurship include Sociology, Economic History, Organization Theory, and Economic Geography. We review these two classes of theoretical formulations of entrepreneurship and innovation in order

Theories of Entrepreneur and his/her Traits

“ The creative process is a wrenching away of a concept or technique from its traditional context or meaning”

Arthur Koestler

Contributions of economics

The definitions and elaborations of the nature and scope of entrepreneurship vary a great deal and are colored by the particular economists' larger conceptions of economic life and the processes governing economic outcomes. The term 'entrepreneur' itself derives from the French verb 'entreprendre' which means 'to undertake', translated from the German verb 'unternehmen' which also means 'to undertake'² The pioneer economic theorist on this subject, Richard Cantillon, a Paris banker (of Irish extraction) defined entrepreneurship in early 18th century as a matter of *foresight and willingness to assume risk*. Distinguishing the entrepreneurial function from that of the capitalist and manager, he saw entrepreneurs as profiting by 'buying at a certain price and selling at an uncertain price'.

While the remarkable insights of Cantillon on entrepreneurship were influential in the work of French economists like Jean Baptiste Say, they were ignored in the work of classical economists like, Adam Smith, Ricardo and Marx (Hebert and Link, 1982; Blaug, 1996).

Johann von Thunen provided in the second volume of *The Isolated State* (1850) the first adequate definition of the scope of entrepreneurship. He defined the gains of entrepreneurship as those left over after payments to capital, labor, and insurance (for calculable risks), suggesting that the entrepreneur's reward is for incurring unpredictable risk that cannot be covered by insurance. In addition von Thunen saw the entrepreneur as 'an inventor and explorer *par excellence*' (Hebert and Link 1982).

Frank Knight built on von Thunen's distinction between risk and uncertainty. He noted that 'the only risk that leads to profit is a unique uncertainty resulting from an exercise of

ultimate responsibility which in its very nature cannot be insured nor capitalized nor salaried' (Knight, 1921). The role of an entrepreneur is to make decisions on *what actions to take and how to*, under conditions of imperfect information on the future. In Knight's formulation, the presence of true 'uncertainty; about the future may allow entrepreneurs to earn positive profits despite perfect competition and long run equilibrium — thereby reconciling his notion of entrepreneurship with the mainstream view of equilibrium economic theory of circular motion (Hebert and Link, 1982).

Joseph Schumpeter is the pivotal figure in the literature of entrepreneurship. His notion of entrepreneurship, emphasizing *newness, and innovation*, aimed to integrate the dynamics of technological change and economic development (Schumpeter, 1928). The entrepreneur adopts 'new combinations' of production factors as the new production function yielding an innovation³. He differentiated 'inventions' (the creation of new technical knowledge), and 'innovation; (the commercial application of that knowledge), and defined the latter as the introduction of a new good, the introduction of a new process, the creation of a new market, the acquisition of a new supply source and, the design of a new industrial organization. Identifying the innovator with the entrepreneur, Schumpeter traced the innovation-induced economic change and disruption as the source of dynamic change in the economy, a precursor to economic development.⁴ The innovation provides, (through a process of 'creative destruction'), the endogenous, intrinsic dynamics of a capitalistic economic system — in contrast to that dynamic role assigned to external (contextual) changes in the traditional Walrasian 'circular economy' model.⁵

Schumpeter viewed innovation (the application of new or existing knowledge) as an act of will, not of intellect, and thus a matter of leadership. Again, for Schumpeter, no one is an entrepreneur all the time, but only when engaged in innovative activity. Further, Schumpeter broke away from earlier notions of entrepreneurship (e.g. Cantillon, von Thunen), by *excluding risk-taking* as a characteristic of entrepreneurship.⁶ Finally, Schumpeter spoke only of innovations in organizational structures of industries but not of firms, though recent research in the Schumpeterian tradition in organizational and evolutionary economics evidences the increasing shift from technological innovations to organizational innovations (Swedeberg, 2000).

In the 1940s, Schumpeter's work on entrepreneurship became broader, incorporating ideas from economic history and sociology, and yielded new ideas and reformulations of old

ideas. He discussed different types of entrepreneurs (industrial, financial, aristocratic) and alternative ways in which entrepreneurship has been financed. Schumpeter now argued that the entrepreneur does not have to be a single person, *but can equally be an organization, either an economic or political one.*

Important contributions to the theory of entrepreneurship were made by the Austrian School descending from Ludwig von Mises and Friedrich von Hayek. Hayek (1972) emphasized the importance of ‘practical knowledge’ (defined as ‘knowledge of practical circumstances of time and place’, or ‘local knowledge’ in anthropologists’ terms) in entrepreneurial development⁷ (Swedeberg, 2000, p. 10). Further, for Hayek, new and unknown knowledge is *created* in the process of entrepreneurship, which involves a ‘discovery process’.

Ludwig von Mises (1963) differentiated himself from Schumpeter by insisting that entrepreneurship involves *anticipations of uncertain events and not innovations*. Driven by a desire for money, the entrepreneur profits by correctly anticipating the market, providing what the customer wants ahead of the competition---essentially viewing entrepreneurship as any kind of arbitrage (Blaug, 2000). For Kirzner (1973), a student of von Mises, the neoclassical assumptions of perfect information and equilibrium prices are untenable. The presence of asymmetric information results in market disequilibria, which give rise to unrealized profit opportunities. The essence of entrepreneurship, according to Kirzner, is ‘knowing where to look for knowledge’, the alertness to recognize unrealized profit opportunities under uncertain conditions. Kirzner’s entrepreneur seizes on a disequilibrium and acts to restore equilibrium, as contrasted with the Schumpeterian entrepreneur-innovator who disturbs an existing equilibrium.

The Anthropological Perspective

Anthropologists who study entrepreneurship in pre-industrial societies and in modern communities bring their discipline’s considerable conceptual and interpretive skills to bear on the subject. In addition to Geertz’s (1963) well known study of entrepreneurship in two Indonesian villages, Fredrik Barth’s (1963) inquiry of entrepreneurship in Norway in the 1960s, and in Africa (1978) illustrate the scope of the anthropologists’ theoretical formulations on entrepreneurship.

Barth (1978) conceptualizes a predominantly agricultural community of Darfur in Sudan as an economic system comprising of two spheres. He shows how the flow of goods and services is

patterned in discrete spheres, and demonstrates the nature of unity within, and the barriers between the spheres. In one sphere cash is used, but not in the other. In the former there is a market for trade in a few products (e.g. onions and tomatoes). Millet production and work to build houses occur in the second sphere, but can only be exchanged for beer and not for cash. This separation of two economic spheres has been long accepted by the Darfur population. An Arab merchant arrived and connected the two economic spheres by offering beer in exchange for assistance in cultivating tomatoes, which he sold on the market for cash, earning himself a nice profit. For Barth, entrepreneurship is ‘discovery’ and alertness to opportunities, and meant the *connection or bridging* of two different economic spheres, between which there is a significant discrepancy in value.

In the Norwegian case study, Barth (1963) applies the same entrepreneurial notion of bridging two spheres in society to generate value. Viewing the economy and politics as different spheres, it is possible (with some risk) to transfer value from one sphere to the other. While it is illegal to buy support in the political sphere through monetary payments, it is possible to contribute financially to political parties, thereby promoting a public project or a government subsidy --- which may be larger in value than the political contributions (Swedeberg, 2000).

Anthropologists also note that activities of entrepreneurship are ensconced in a cultural setting, and consist of a ‘reading’ of that culture (Lindh, 2000). Entrepreneurial ‘discovery’ and interpretation of opportunities are matters of genuine creativity and cultural interpretation. Culture has everything to do with entrepreneurial processes especially in a competitive and a constantly evolving business milieu where ‘discovery’ is a continuous process⁸. Describing the entrepreneurial activities of Freddy, the Strawberry Man, in Venezuelan Andes region, Lindh (2000) shows how Freddy manipulates and recombines different cultural elements as he engages in decision-making, as innovator of business combinations, and as he negotiates complex issues of risk and trust with his customers and suppliers. This range of attributes of an entrepreneur should not depict him as a loner or a hero bucking a crowd. His ability to ‘read’ opportunities and implement them is due to his higher degree of sensitivity to what others are looking for in a community. The role of anthropology is in the ‘explication of how difficult-to-elucidate understandings of culture, risk, trust, individual, and community play into the shape that entrepreneurship takes in particular settings’ (Lindh, 2000).

Psychology

Psychological formulations of entrepreneurship have two objectives: one, to identify the psychological traits of an entrepreneurial personality, and two, to identify outside factors (e.g. the pattern of child socialization, the minority status of the entrepreneur's parents) which decisively shape the entrepreneur's personality. Most students of entrepreneurship believe that psychological studies have failed in singling out either widely acceptable 'typical' psychological attributes of the entrepreneur, or the factors representing the interaction between the entrepreneur and his or her social context (Thornton, 1999; Swedeberg, 2000). Even the famous studies by McClelland (1961) and Hagen (1962) are examples of theoretical overreach⁹

The Context or Environment of Entrepreneurship and Innovation

The second class of theories of entrepreneurship argues that it is unlikely that the entrepreneurial creation of a new product, process, or organization can be explained solely in terms of the traits of the entrepreneurs, independent of the *situations* in which they operate. When one realizes the complexity of an entrepreneurial innovation (comprising of a creative idea, a business vision, luring of vital capital, risk-taking, and overcoming resistance to change), the emphasis on the individual entrepreneur in the literature can be understood in terms of the 'hero' bias in Western culture and the methodological individualism in economics in particular. The history of technical change, however, is not the history of single inventors or of random events (Usher, 1954). The birth and spread of an innovation and breakthroughs in technology have been shown to be made possible by complementary technologies, institutions, and resource endowments (Rosenberg, 1983; Hayami and Ruttan, 1985; Lakshmanan and Anderson, 2002).

The central idea of the second set of theories is that entrepreneurship, viewed as the creation of an artifact or a new organization, is a *context-dependent socioeconomic process*. Granovetter (1985) argues that economic changes can not be separated from their social contexts --- with economic behavior always embedded in social relations, which have sometimes positive and sometimes negative impacts on economic outcomes¹⁰. Since innovations are in their nature *uncertain, fragile*, and (if successful) likely to be *disturbing to the existing order*, they are more likely to flourish under supportive social contexts or environments that provide *flexibility, connectedness, and capacity for resource mobilization and coalition formation*. Such contexts

and environments, where present, offer a variety of structural features and social linkages and facilitators that promote innovative actors --- while other contexts constrain entrepreneurs. As the innovative actors function and succeed, the decisions they make in social settings, which evolve over time, in turn modify the social 'opportunity structure' --- the structure of economic opportunity and the structure of differential advantage to exploit the opportunities in that society (Lakshmanan, 1993; Thornton, 1999). This notion that entrepreneurial actors affect and are affected by their context is a seminal argument in many disciplines.

The definition of the context of entrepreneurship varies with the *theoretical focus* of the discipline involved and the *level of analysis* used. At a macro level, the context of entrepreneurship has been framed in terms of the evolving *value structure* of the society (Weber, 1988). At the micro level of a firm, a useful distinction can be made between the *internal and external context* of the firm. The *internal* context of the firm pertains to the organizational conditions (structure and social arrangements) inside the firm that can actively stimulate or constrain innovation. Organizational arrangements supportive of innovation are the firm's *integrative structures and cultures* --- that emphasize diversity, multiple intra-firm and extra-firm linkages, collaboration and teamwork (Kantor, 1988). The *external* context refers to the firm's environmental factors, which serve as the infrastructure for innovation. This infrastructure includes the resource endowments (knowledgebase, human capital), and institutional structures and change processes to sustain innovating actors and communities.

Other sociologists, economic historians and economic geographers have conceptualized the context of entrepreneurship in other ways. A fruitful definition of entrepreneurial context is *proximity* to other innovators. This notion of proximity is specified in two alternate ways: defined in terms *of a position in networks or in geographic or regional terms*. We review in what follows these different formulations of the context and infrastructure of entrepreneurship and innovation.

Context Viewed as Reward Structure

For the economist infrequently concerned with the issue of context, the context of entrepreneurship is defined as 'the rules of the game' or the reward structure for entrepreneurs (Baumol, 1990). Baumol notes how the reward structure in a society have varied dramatically from one time (ancient, medieval, and modern times), and place (Roman Empire China, and

Europe) to another. He shows how the varying incentive structures (to create wealth and social position) in different eras and times influenced the *size and composition* of the entrepreneurial group in respective times and places. North (1990) argues that the individual entrepreneur is an agent of change, who responds to the incentive structures embodied in the institutional framework¹¹

Context Viewed as Value Structures

Weber (1988) argues that societal values are critical to the promotion of entrepreneurship. A decisive shift in values and attitudes towards entrepreneurship --- from hostility to acceptance and promotion --- occurred after Reformation in the Western world. According to Weber, this shift was driven by a religious movement, the ascendance of ascetic Protestantism¹², which cultivated a positive attitude towards money, work, thrift, and postponement of gratification --- all of which facilitated the attitude change towards entrepreneurship. The methodical and quasi-ascetic attitude to work, Weber suggests, not only promotes a positive attitude to entrepreneurship but also infuses the economy itself with a new spirit. For Weber, entrepreneurship occurs only in an exchange economy and comprises of a skilful direction of enterprises, which respond to the opportunities in the market, rather than to the personal attributes of the entrepreneur.¹³

Lipset (2000) examines the role of culture as a facilitator or constraint on entrepreneurship, in his comparison of North American and Latin American experience with entrepreneurship. Culture validates models of belief, thought, and action in a society as mediated by religion and social structures. The relative failure of Latin American countries to develop on a scale comparable to those of North America is attributed to the prevalent value systems --- varying in their degrees of legitimation of entrepreneurship --- in these two areas. ‘The North American offspring of Great Britain seemingly had the advantage of values derivative in part from the Protestant ethic and from the formation of “new societies” where feudal ascriptive elements were missing’¹⁴. Catholic Latin America, on the other hand, was dominated by feudal elites, so that the entrepreneurial activities were largely carried out by immigrant minorities. Over time many of these latter successful entrepreneurs involved themselves in social networks and reference groups which supply more prestige than their vocation.¹⁵ Landes (1951) makes a similar point, explaining the delay of France in completing its industrialization (as compared to the U.S.).

Gershenkeron (1962), an economic historian, disputes Lipset's and Landes's arguments, cautioning against the error of viewing social attitudes as prerequisites on the assumption of an existence of a homogeneous and generalized value system in society. Gershenkeron offers counterevidence of the 18th century France's *fermiers generaux* and of 19th century Russia's emancipated serfs, who became entrepreneurs in spite of an unfavorable cultural environment. He notes the different paths to economic development in different countries, which use *substitute mechanisms* and different 'institutional agents' (governments, merchant banks, etc.). Lakshmanan (1993) also notes, reviewing the rapid passage of Meiji Japan into an entrepreneurial industrial society, that Japan functionally substituted for the role of Weberian Calvinistic ethics in effecting a break with past values and creating a normative structure favorable to rational, industrious, and entrepreneurial efforts. Creative use of the past and its traditions and some myth creation were used to create a wide acceptance of Western technology and ideas, while emphasizing self-discipline, constant knowledge seeking, and the idea of a common interest --- all clothed in the garb of received tradition and imperial sanctions. Engagement in modern entrepreneurial activities for the greater glory of Japan and the Calvinistic drive to work for one's salvation and the kingdom of God were very comparable schemes for normative change favorable to entrepreneurship.

The Internal Context of the Firm

A simple differentiation of the internal context of a firm is its size. There is a different organizational context for innovation inside a large versus a small firm. Arrow (1983) notes that the decision-making structure varies with the size of the firm. In small firms, decisions to initiate research and implement the innovation tend to be taken by small groups, while research and development decisions are separate and made by different groups in large firms. Further, financing involves the difficulties of communicating with an external capital market in small firms, and with an internal capital-allocation mechanism in large firms. In this situation, Arrow suggests that small and large firms tend to be good at different types of innovations --- the former in research and smaller development processes and the latter in larger developments while buying a considerable portion of research for subsequent development.

Kantor (1983, 1988) offers a more elaborate and multi-dimensional portrait of the firm's internal environment which influences innovative behavior. Innovations implemented by

individuals and groups of individuals inside a firm involve several tasks --- namely, idea generation, acquisition of resources for idea implementation, realizing the innovation, and innovation diffusion. This progression of tasks makes innovation a knowledge-intensive, uncertain, and fragile process whose success is potentially threatening to vested interests in the firm. Consequently, the viability and success of each of the innovation tasks require an intra-firm environment of support and facilitation. Such an environment or firm's organizational conditions (structure and social arrangements) are complex structures that link (intra-firm and extra-firm) people in multiple ways, emphasizing diversity, flexibility, collaboration and teamwork. Kantor suggests that this type of intra-firm environment or organizational conditions can be designed in a way that each of the several tasks that make up an innovation can be facilitated.

The External Environment of the Innovative Firm

The external environment of an innovative firm is necessarily vast and can be conceptualized from different perspectives and at different levels. Economic Geographers and Regional Economists, for example, conceptualize the external environment of an innovative enterprise in terms of their primary interest in the differential evolution of and economic outcomes in urban places and regions. Their analytical focus from this perspective is two-fold: *one*, to understand how the activities of the innovative enterprise are affected by the attributes or the 'opportunity structure' of its environment, and *two*, how the entrepreneurial activities of this firm and other firms change over time the 'opportunity structure' in the environment. These geographers and economists formulate the firm-environment interrelations and the 'mutual construction' of innovative enterprises and their environments in terms of their disciplines' concepts such as territorial complexes with their Marshallian and Jacobsian economies, innovation milieus, structures of knowledge, governance networks and, endogenous regional growth. Different formulations of the relations between innovative enterprises and their environments appear from the perspectives and the core concepts of a second group of theorists, namely, Business and Organization theorists and Sociologists.

Take the example of the innovative firm's environment viewed as networks --- which theorists from both groups do. However, as we note below, the functional scope of the networks as aids to innovation are formulated with different organizing concepts and objectives by the sociologists and business theorists on the one hand and by the geographers and economists on

the other. The first group use networks as *an analytical tool* to shed light on enterprise-environment relations, among enterprises and in the environment of organizations (Powell and Smith-Doerr, 1994). Networks are central to the notion of social capital and provide the entrepreneurial actor certain resources, allowing better access, timing, and chances for referrals. The position of an innovator in the network structure is key since certain structural arrangements offer benefits and opportunities to the entrepreneurs (Burt, 1992). The second group (geographers and economists) view networks differently, as a *form of governance*, as material and non-material glue that binds the webs of interdependencies among entrepreneurial enterprises, and their partners with complementary know-how, and financial and production assets. Networks (viewed from the perspective of transaction cost theory as intermediate between markets and firm hierarchies) are more flexible in seizing new opportunities by rapidly decomposing and recombining innovation assets. In a view of geographic space as relational, territorial (and transterritorial) networks become cooperative mechanisms for the construction and reproduction of specific competencies, and for continual collective learning. The network approach, in this version, captures the dynamic relations between local and regional environments of innovators and the global markets, networks and enterprises.

In the interests of clarity and coherence, we discuss separately the above two research traditions (on firm-environment interrelations) with their different functional scope and organizing concepts. We plan to survey the rich economic and geographic literature on innovative enterprises and their environments in the next major section (of this chapter) dealing with 'Innovation and Urban and Regional Growth'.

We discuss below conceptualizations of the firm-environment relationships by sociologists and business theorists. Three strands of inquiry constitute this literature: Environment as Innovation Infrastructure, Innovative firms as nodes in Networks and Population Ecology models

Environment as Innovation Infrastructure

Viewing the process of entrepreneurship as a collective achievement requiring crucial roles not only from the entrepreneurial individual (or firm) but also from a variety of other private and public actors in the innovator's environment, this strand of inquiry takes the interorganizational community as the innovation environment. One useful framework from this perspective is the

notion of an infrastructure for innovation. While the constituents of this innovation infrastructure appear in many guises (Scott, 1987; Meyer, Scott, and Deal, 1981; Van De Ven, 1993; Sjostrand 1995), two classes of constituents may be usefully noted: first, an *institutional component*, namely, institutional arrangements or a governance structure that legitimates, regulates, and standardizes the innovative activities of members, and second, a *resource component*, a set of community resource endowments which include knowledgebase and competencies, human capital, and financial arrangements.¹⁶

An institution is constituted by human interaction and exchange and facilitates or hinders coordination and allocation processes. It is a social construct for a coherent system of shared and enforced norms (Sjostrand, 1995). The introduction of a new product, which may be sophisticated and costly, and whose acquisition may entail health or welfare effects needs social legitimation. The creation of trust is a key entry barrier for innovations in this context (Van De Ven, 1993). To lower the quality and performance uncertainty, a variety of regulatory mechanisms, licensing arrangements, guarantees, and other institutions of trust emerge in order to facilitate innovation. Another institutional facilitation of innovation diffusion is the setting of technical standards related to components, processes, and performance indicators of new technologies to be introduced. This standard setting is driven by social and political dynamics and can be cooperatively arrived voluntary standards or publicly mandated. These multiple roles of institutional component of infrastructure --- trust creation, norms and regulations, and technology standards --- are critical to efficient operation of the innovation market mechanism.

The resource component of the innovation infrastructure has three elements. First is the scientific and technological knowledgebase critical to innovation. Firms depend heavily on outside knowledge sources for commercializing their new products. To the degree public investments (e.g. National Science Foundation, National Institutes of Health) promote the growth of new knowledge, the infrastructure is innovation friendly (Freeman, 1986; Nelson, 1993). The second component is financial instruments facilitating innovation. Venture capital is key to nurturing an innovator during the process of commercial transformation of basic knowledge. Another aspect of the financial infrastructure is the industry wide (biomedical) arrangement of support from the health care insurance industry and third party reimbursement systems (Van De Ven, 1993). Third, a pool of varied and quality human capital (R &D, manufacturing, marketing, distribution, etc.) is a vital component. The recruitment, training and use of this human capital in

innovation activities, as well as the knowledge exchange and sharing (Von Hippel, 1986) facilitate innovation.

Innovative Firms as Nodes in Networks

This perspective views the innovative firm as embedded in networks of linkages which both facilitate and constrain the innovators by guiding their interests and their ability to act (Powell and Smith-Doerr, 1995). The firm's entrepreneurial actions are embedded in concrete, ongoing networks of social relations. A network participant's relationship with others in the network is defined as *social capital*, which is viewed as critical to a firm's operation as physical and human capital (Burt, 1992).

To explain the diffusion of an innovation in a community, network theorists have taken two alternative approaches (Nohria and Gulati, 1995). One is a *relational* approach, where networks lead the entrepreneur to certain resources, the focus here is on which node (or *who*) in the network structure has privileged access to resources. The second is the *positional* approach, which addresses the question of *how* certain structural arrangements create entrepreneurial benefits and opportunities (Burt, 1992). This is a conceptualization of the entrepreneurial process in a structural fashion. Burt argues that network players who prosper are those whose immediate networks are dense and overlapping and whose links to more distant networks are rich in non-redundant contacts. Such players are structurally autonomous, in the sense that they can realize the knowledge and control benefits deriving from the existence of what are called 'structural holes'. If there is no link between two groups in an actor's network, Burt postulates the existence of a 'structural hole' which are opportunities for brokering gaps in the social structure. The actor can intervene between the two groups as a *tertius gaudens* ('the third that benefits').

Population Ecology Models

Unlike the above formulations of the adaptive capabilities of innovative organizations, population ecologists focus on the selectivity of the environment which influences which innovators survive, and view the environment as the key mechanism in explaining organizational diversity (Nohria and Gulati, 1995). The emphasis is on the total population of enterprises as the analytical unit in order to account for why certain organizational forms flourish while others disappear.

Population ecologists emphasize three evolutionary processes: *variation* (the creation of organizational variety by random and non-random events), *selection* (the differential selection for survival of some organizational types over others), and *retention*. (replication of selected forms until the next round of variation and selection. This is a broad argument about an innovative enterprise's survival. Variation of this ecological argument appear in the economic literature concerned with Innovation and economic growth we survey below (e.g. Nelson and Winter, 1982).

The External Environment in the Long Run

The emphasis so far has been on the *nature and function* of the external environment an innovative individual or enterprise confronts, while introducing a new product, process, or organization in *the short and the medium run*. A similar temporal frame will also be used as we survey the rich literature on Innovation and Urban and Regional Growth in the next section. We build (towards the end of this chapter) on the results of this extensive survey of on private sector entrepreneurship and innovation in order to formulate a model of entrepreneurial and innovative activities in the *urban public sector*.

A useful backdrop and preparation for such a model formulation is a quick survey of how the nature and function of the 'external environment' of innovative activities have been conceptualized *in the long run* as well. In other words, what attributes and functions of the external environment have been important in the economic history of innovative eras and regions? The relevant economic literature is vast and one can only selectively mine this field for some insights (e. g. Rosenberg and Birdzell, 1986; Braudel, 1981; Chandler, 1977).

In their magisterial survey of Western growth, Rosenberg and Birdzell (1986) note that innovation emerged as a key factor in Western growth as early as the mid-fifteenth century and had become pervasive and dominant by mid-eighteenth century. Innovation occurred in trade, production, products, services, institutions, and organization. The key attributes of innovation are: uncertainty, search, exploration, financial risk, experiment and discovery (Rosenberg and Birdzell, 1986). An economic innovation requires not only an idea, but also an experimental test of the idea in a *laboratory, factory and market*. This meant a social capacity to effect innovations, with incentives for innovation, with a source of innovation ideas, and with

organizations and institutions which promote experimentation under uncertainty and the ability to overcome resistance to innovation.

Rosenberg and Birdzell draw the general conclusion that the West's ability to attract innovation and 'the lightening' of economic revolution and long term growth lay in its ability to create an 'environment', whose elements were; the wide diffusion of authority.

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ENDNOTES

¹ The central idea of Jacobs (1969) is that the crucial knowledge generation process in urban regions (which bring together diverse individuals and enterprises) is the cross-fertilization of ideas across different kinds of work and industries. The birth of the financial services industry in New York in the 19th century derived from the common need experienced by the grain merchants and cotton merchants in that city. Jacobs argues that the variety of economic activities in a region promotes knowledge externalities and thereby employment and income growth

¹ In the 16th century, Frenchmen who undertook military expeditions were called entrepreneurs. French economists described persons who assumed risk and uncertainty to produce innovations as entrepreneurs.(Berthold 1951, Cunningham and Lischeron 1991)

¹ In Schumpeter’s view, the knowledge underlying the innovation need not be new; it could be existing knowledge that has not yet been commercialized (Hebert and Link 1982, p. 79).

¹ The absence of the entrepreneur in mainstream theories of markets, firms, organizations, and change impoverishes our understanding---a situation eloquently described by Baumol (1990) as a study of Shakespeare in which ‘ the Prince of Denmark has been expunged from the discussion of Hamlet’.

¹ Schumpeter emphasized only the ‘creative’ component of the entrepreneur in his theory of economic development. Subsequent theorists of economic development , particularly those interested in developing economies such as Albert Hirschman (1958), suggest that a functional entrepreneur embodies not only creative (‘rebel against society’) components, but also ‘cooperative components-engineering agreements among all participants such as the capitalist, manager, suppliers and the inventor of the new product or process (Hebert and Link 1982, p.80-81).

¹ ‘ Risk obviously always falls on the owner of means of production or of the money-capital which was paid for them. Hence never on the entrepreneur *as such*’ (Schumpeter 1961).

¹ “ To know of and put to use a machine not fully employed, or somebody’ skill which could be better utilized, or to be aware of a surplus stock which can be drawn upon during an interruption of supplies is socially quite useful as the knowledge of a better technique” (Hayek 1972)

¹ Lavoie (1991) emphasizes the role of culture in the entrepreneurial discovery. ‘Profit opportunities are not so much like road signs to which we assign an automatic meaning as they are like difficult texts in need of a sustained interpretation’what gives them (entrepreneurs) the ability to sense what their customers wanttheir capacity to read the conversations of mankind’.

¹ McClelland’s hypothesis is that entrepreneurship has to do with a person’s need for achievement. His argument that the achievement motive of ascetic protestants generated modern capitalism was an overstatement of Max Weber’s notion of the ascetic Protestant helping to create *the spirit* of modern capitalism, but none of its many institutions such as enterprises and commercial law. Hagen’s statement of a minority family status as a stimulus to entrepreneurship is similarly untenable.

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¹ In the 16th century, Frenchmen who hired mercenary soldiers to undertake military expeditions for princes were called entrepreneurs. In the 18th Century, that concept was used for economic actors who undertook contracts for public works, or introduced new agricultural techniques in their land, or who risked their own capital in industry. (Berthold 1951, Cunningham and Lischeron 1991, Martinelli 1994)

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¹⁰ Granovetter (1995) illustrates this in the case of small firms in developing countries, suggesting that the rise of the firm requires some solidarity between people(particularly among immigrants and minorities)---but not too much solidarity. While the entrepreneur has to trust people who will be hired, there is the danger of too many claimants on the firm from the community. In other words, Granovetter notes the need for a proper balance between ‘the coupling’ and ‘the decoupling of social relations, for the rise and continued existence of an enterprise.

¹¹ In North’s (1990)work, there is no serious effort to develop a new institutional theory of entrepreneurship (Swedberg 2000). North does not provide a theoretical explanation of what makes entrepreneurs change existing institutions which are based on earlier economic paths (Sjostrand 1995). While maintaining endogenous sources of change are important, North does not offer any explanation.

¹² Ascetic Protestantism includes Calvinism, Methodism, Pietism, etc., According to Weber, while greed has always characterized businessmen, a methodical and quasi-ascetic attitude to work had not. As the attitude to entrepreneurship became positive, the power of religion to regulate the economy weakened and entrepreneurship has been set free.

¹³ As Swedberg (2000) points out, Weber’s theory of entrepreneurship is sometimes wrongly related to his theory of Charisma, which suggests that other people want to follow a charismatic person because of his or her extraordinary personality. Charisma has functioned, according to Weber, as a crucial factor of change during the early stages of mankind and is far less important in exchange and capitalist economies with which entrepreneurship is associated by Weber.

¹⁴ A study of business leadership in the U.S. in 1870, the period of its take off into industrial development, indicates that 86% of them came from ‘Colonial families’ settled in the country before 1777. Only 10 % were foreign-born or children of foreign-born (Lipset 2000). More than 98% of the post-Civil War business elite were protestant, though this per cent has declined over the years.

¹⁵ Japan which transformed its cultural incentives more favorable to entrepreneurship in their modernizing Meiji era officially gave business entrepreneurs (e.g. Presidents of corporations) new social prestige (Hirschmeier 1964).

¹⁶ Van De Ven (1993) identifies a third infrastructure component called Proprietary Functions, which pertain to the firm’s capacity to commercialize a new idea through the typical value chain activities (R&D, production, marketing, distribution) a la Porter. This component is more related to the firm rather than the environment.