

Geography and Regional Economic Development: The Role of Technology-Based Small and Medium Sized Firms

Introduction to the Special Issue of
Small Business Economics

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Technological progress does not appear to proceed smoothly but indeed seems to involve various types of disequilibria. Most prominent among these is the uneven international and regional distribution of economic activity. For much of the past thirty years the idea that location did not matter for economic activity seemed to predominate in much of the economic literature. Beginning with the work of Borts (1960), there was a general acceptance of the belief in the eventual convergence of the rate of economic growth between nations and regions and a corresponding equalization of wages and skill levels. In a world of constant or decreasing returns to scale, any observation of regional disparities was dismissed as temporary disequilibrium and was not seen as particularly interesting.

Recently, however, there has been a resurgence of interest among economists in questions relating to geography. Discrepancies between empirical observation and theory motivated trade economists to begin to re-examine the question of regional disparities (cf. Krugman, 1981) and to reconcile theories of economic growth and international trade (cf. Grossman and Helpman, 1991). In addition, theorists have considered the possibility of increasing returns to scale and the existence of other types of non-convexities which would lead

to multiple equilibrium and a resulting uneven distribution of economic activity (Romer, 1986, 1990; Lucas, 1988, 1993; Krugman, 1991a, b). These developments complement a growing literature on externalities or spillover effects across economic agents (Griliches, 1992), especially empirical evidence that economic spillovers could be geographically mediated (Jaffe, 1989; Jaffe et al., 1993; Acs et al., 1992). And, another related strand in the economic literature has extended the consideration of the role of institutional capabilities to a spatial and geographically defined dimension (Dosi, 1988; Nelson, 1994; Zysman, 1994). The influential work of Porter (1990) has provided rich case studies of the geographically concentrated industrial systems. These literatures often reference and build upon the older and prominent work of Marshall (1920), Weber (1929), Young (1928), and Loesch (1954).

At first glance, there seems to be some irony in the fact that geography has re-emerged as an important topic at a time when we enter what is generally known as the information age. We increasingly live in an age of instantaneous global communications which seemingly make both time and space less important. Events that happen anywhere in the world can be seen, heard and experienced immediately and the urgency of new mediums of communication transforms the experience to make distant events uniquely personal. New information technologies have transformed the nature and quality of work and we are less tied to direct personal contact and interaction. Software for American companies based in Silicon Valley is easily tele-transported half-way around the world to engineers in India in a strategy of global

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work-sharing. Foreign exchange markets operate twenty-four hours a day allowing traders to make transactions around the clock. Indeed, there is less need for impressive corporate headquarters or even for formal offices as work can easily be done at home, in the car or in any other imaginable location. Via e-mail, voice mail, fax and cellular phones we are never too far away to be easily accessible.

Despite these advances in communication, most of our lives are essentially local in nature and the things that we tend to devote our attention to typically focus on our immediate locality. Consider the fact that most newspapers and news broadcasts are dominated by stories of local interest and importance. While we have eyewitness knowledge of atrocities in Bosnia, in Haiti and in Rwanda we are not moved to action. Whatever the reasons may be our lives are dominated by the local – by concerns of what occurs in our immediate neighborhood and the quality of our local environment. Ask anyone who has ever attempted to maintain a long distance romance, or tried to purchase a house while living out-of-town, location and proximity matter for most of the activities that we really care about.

This special issue of *Small Business Economics* focuses on the role of small and medium-sized firms in a geographic context. Specifically this issue provides a survey of the variety of different approaches which are applied to questions of regional economic development and which consider the role of small and medium-sized firms in a regional context. While some have argued that large corporations are preeminent in the economy and that the role of smaller firms has been overestimated (Harrison, 1994), such a view overlooks the synergy between large and small firms, the stronger attachment of small firms to their local areas, the relative flexibility and adaptability of small firms in times of economic restructuring and finally, the potential of small firms to contribute to the growth and evolution of industries and national economic systems. It is these issues which were explored at a special session of the 1994 Association of American Geographers Annual Meeting in San Francisco and which are presented here.

The first article by Rolf Sternberg provides a cross-country comparison of technology policies

and an assessment of their impact on the development of technology-intensive regions. Since the 1980s, all industrialized countries have established technology policies aimed at increasing economic growth through the development of scientific and technical resources. Most technology policy initiatives are formulated at the national level and are predominantly concerned with questions of financing. This represents a fundamental mismatch since high-tech industrial development is observed to be strongly regional in nature and national technology policies do not explicitly consider this regional element nor do they consider the regional context in which they are realized. Sternberg's paper provides a comparison of the impact of technology policies in the United States, Germany, England and Japan. His results demonstrate that technology policies have had a significant, although unintended, impact on the development of high-tech regions. The spatial effects of government technology policy promote high-tech regions over other types of regions, although this influence is primarily unintended. Sternberg concludes that economic development policy initiatives should be more explicate in considering their regional impacts.

Yet government is only one actor affecting the development of regions and changes in patterns of trade in a world of expanding markets has important impacts on small- and medium-sized firms. Meric Gertler considers the effect of changing market relations as a challenge to German export dominance in the machinery industry in *Worlds Apart: The Changing Market Geography of the German Machinery Industry*. Long regarded as an example of a successful industry embedded in a supportive regional context, the German machine industry has been subject to both cyclical and structural changes in the 1990s. Gertler questions the conventional wisdom that German manufacturing has become too expensive and instead argues that evolving market relations and changing market geography are responsible for problems in the industry. In response to new international opportunities, German firms have developed new subcontracting relationships with suppliers in Eastern Europe and undermined the machine industries ability to learn through interactions with sophisticated customers at home. The most successful firms have been able to adapt to this

changing market geography by cultivating new producer-user relationships in emerging regions.

The interaction of changing market geography with government policies is considered by Soohun Chon in the third article in this volume. In *Small and Medium Sized Firms in the Republic of Korea*, Chon focuses on the underdevelopment of small and medium-sized firms in the Republic of Korea and the ways in which this has inhibited the ability of the economy to respond to changing market geography. Chon finds that Korea's miraculous growth and meteoric rise as a newly industrializing economy has carried with it considerable costs. Initial reliance on Korean large business groups, or *Chaebols*, was an appropriate policy choice for creating competitive advantage through economies of scale for the export market. However, as a result, the neglect of the small and medium-sized industrial sector has become a burden on the performance of these same big businesses. This issue is particularly critical because Korea must make a transition into more knowledge-intensive industries in the face of rising real wage levels. Chon's paper argues that the underdevelopment of a small business sector has undermined the overall efficiency of the Korean economy.

The presence of small business may facilitate the restructuring of an economy but the composition of the small business sector and the way in which the small business sector complements large business and other institutions is of further importance. John Britton considers the structure of the technological infrastructure in Canada in the article *Specialization versus Diversity in Canadian Technological Clusters*. One of Canada's goals is export-led growth in technology-intensive activities and small firm entrepreneurship plays a pivotal role towards this end. Britton considers the structure of the technology-intensive sector of the Canadian economy and identifies key technological clusters. Britton documents Canadian underinvestment in R&D in comparison to other countries and argues that Canada may be spreading its technological resources too thinly. This compounds the difficulty of accumulating the necessary technological infrastructure for smaller, lesser developed Canadian cities and it seems unlikely that these cities will achieve the critical mass needed to respond to trade liberalization.

The question of how small firm performance is affected by characteristics of place is addressed in *Evaluating Small Firm Performance in Local Context: A case study of Manufacturers in Columbus, Ohio*. Nancy Ettlinger and Michelle Tufford approach corporate restructuring from a place-based perspective. Instead of focusing on a firm or industry, they focus on the performance of a local economy using a methodology that can be used for comparative analysis of sectors within communities. Using a sampling strategy that represents local industry mix they link the performance of firms to the local context. Their results indicate that small manufacturers in Columbus are relatively uncompetitive. Those few firms that are performing, at higher than the national standard in their industry are found to have invested more in labor than in capital. Their results suggest that effective restructuring entails qualitative investment and that new programs and local initiatives oriented toward the development of new technology may not be fruitful unless simultaneous investment is made in the intangible realm of human relations.

Phil Cooke provides a conclusion to this volume with an analysis of new approaches to regional economic development which rely on building regional innovative infrastructure. Cooke provides a synthesis of successful approaches which have been pioneered in Europe and the United States. The approach of learning through networking has proven to be successful in some of Europe's more dynamic local economies and Cooke finds that this approach is applicable and easily transferable to older industrial centers in the U.S. This paper provides an assessment of knowledge transfer practices at the regional level and outlines the key elements which promote successful regional innovative networking practices.

References

- Acs, Zoltan J., David B. Audretsch and Maryann P. Feldman, 1992, 'Real Effects of Academic Research: Comment', *American Economic Review* 82(1), 363-367.
- Borts, George H., 1960, 'The Equalization of Returns and Regional Economic Growth', *American Economic Review* 50(1), 319-347.
- Dosi, Giovanni, 1988, 'The Nature of the Innovative Process', in G. Dosi, R. Nelson, G. Silverberg, C. Freeman and

- L. Soete (eds.), *Technical Change and Economic Theory*, London: Pinter, pp. 221-238.
- Griliches, Zvi, 1992, 'The Search for R&D Spillovers; Comment', *Scandinavian Journal of Economics* 94 (Supplement), S29-S50.
- Grossman, Gene and Elhanan Helpman, 1991, *Innovation and Growth in the Global Economy*, Cambridge, MA: MIT Press.
- Harrison, Bennett, 1994, *Lean and Mean*, New York: Basic Books.
- Jaffe, Adam B., 1989, 'Real Effects of Academic Research', *American Economic Review* 79(5), 957-970.
- Jaffe, Adam B., Manuel Trajtenberg and Rebecca Henderson, 1993, 'Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations', *Quarterly Journal of Economics* 63(3), 577-598.
- Krugman, Paul, 1991a, 'Increasing Returns and Economic Geography', *Journal of Political Economy* 99(3), 483-499.
- Krugman, Paul, 1991b, *Geography and Trade*, Cambridge, MA: MIT Press.
- Krugman, Paul, 1981, 'Trade, Accumulation, and Uneven Development', *Journal of Development Economics* 8(1), 149-161.
- Loesch, Augustus, 1954, *The Economics of Location*, New Haven: Yale University Press.
- Lucas, Robert E., 1988, 'On the Mechanics of Economic Development', *Journal of Monetary Economics* 22(10), 3-42.
- Lucas, Robert E., 1993, 'Making a Miracle', *Econometrica* 61(1), 251-272.
- Marshall, Alfred, 1920, *Principles of Economics*, 8th ed., London: Macmillan.
- Nelson, Richard, 1994, 'The Co-Evolution of Technology, Industrial Structure, and Supporting Institutions', *Industrial and Corporate Change* 3(1), 47-63.
- Porter, Michael, 1990, *The Competitive Advantage of Nations*, New York: Free Press.
- Romer, Paul, 1986, 'Increasing Returns and Long-Run Growth', *Journal of Political Economy* 94(5), 1002-1037.
- Romer, Paul, 1990, 'Are Nonconvexities Important for Understanding Growth?', National Bureau of Economic Research (NBER) Working Paper #3271.
- Weber, A., 1929, *Theory of the Location of Industries*, Chicago: University of Chicago Press.
- Young, Alan, 1928, 'Increasing Returns and Economic Progress', *Economics Journal* 28(2), 313-333.
- Zysman, John, 1994, 'How Institutions Create Historically Rooted Trajectories of Growth', *Industrial and Corporate Change* 3(1), 243-283.

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