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Strategic management of places and policy

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1. Introduction

Regional economic development has always aimed to maintain and increase jobs, regional product and wealth. Policies and programs to achieve these goals have focused on firm and job formation and maintenance, hard and soft infrastructure investment, and restructuring. None of this has changed but a qualitative restructuring or change in emphasis is emerging. Increasingly the focus is on firm formation and capital development policies and less on incentive based firm attraction and hard infrastructure investment. More specifically, contemporary regional economic development policy is focusing more on innovation, entrepreneurship and technology industry cluster formation in an effort to maintain and enhance competitiveness through the formation of firms and thus jobs, rather than through attraction and physical infrastructure policies. As such, a major change in the strategic management of places and policy is evolving (Acs et al. 2002; Audretsch 2001).

One of the more interesting and important questions in regional economic development today is why policy and planning seem to be refocusing toward firm formation, entrepreneurship and industrial clustering of technology intensive industry. The first part of the paper examines this question. Next, this emerging policy orientation is examined and illustrated with examples. It is concluded that there are at least two primary factors that will influence the successful development and implementation of entrepreneurship and firm formation development policy. These are: strategic regional economic development leadership; and the need for better information and knowledge for planning and decision-making. A summary of an earlier analysis of leadership and its role in regional economic development is presented to illustrate its importance as well as its potential policy relevance. Several cases addressing and illustrating innovative responses to the information and knowledge needs are provided. Conclusions are presented at the end of paper.

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2. Changing regional economic development policy: Causes

Stough et al. (2002), Stough and Kulkarni (2001), and Williams and Stimson (2001) and others have observed that the late 20th Century and the early 21st have witnessed the arrival and partial maturing of a new generic technology, first as transistors, then the microprocessor and more recently the fusion of the latter with information and communications technology (ICT), and telecommunications infrastructure. ICT has radically transformed people's access to information and knowledge throughout the world. The globalization of telecommunications through the rise of ICT has made the interaction between individuals possible at trivial or almost no cost (Audretsch 2001, p. 4). Thus, the broad and deep evolution of ICT has enabled people to acquire knowledge and to experience things virtually and actually at a scale that could not have been imagined just a few years ago.

The globalization of information and to some extent ideas and knowledge have enabled more effective opportunity identification and exploitation. In particular, corporations were quick to identify factor cost differentials and to move plant operations when cost savings could be achieved. This led to at least two systemic policy responses on the part of regions (Audretsch 2001). Places possessing low-cost but educated workers (as in China where the marginal cost of labor is near zero) increasingly attracted traditional production operations away from higher wage countries. And higher wage countries increasingly substituted capital for labor in an effort to retain these facilities, thus offering an explanation for the initial rise of the globalization of the economy and associated regional responses.

As Audretsch (2001, p. 4) and others have observed, however, globalization would not have become the pervasive force it has if only driven by the rise and maturing of ICT. Political change in other parts of the world such as Eastern and Central Europe, China, India and Viet Nam resulted in new stability in formerly inaccessible places. As this ''opening up'' occurred, access to significantly lower cost but qualified labor increased.

The response in higher wage developed countries took two forms. One was to accelerate the substitution of capital, i.e., in particular, substituting technology for labor in an effort to retain the high end of the more traditional manufacturing and fabrication activities. This of course resulted in some job loss but not nearly as much as when operations moved offshore. Nevertheless, global wage differentials were so great that capital substitution was only partly effective. This is the basic concern behind the recent WTO demonstrations.

An alternative response involves shifting economic activity to high wage and high employment industries (Audretsch 2001). That is, shifting the emphasis to firm and job formation in the technology intensive or knowledge industries. Thus, the reason for the increasing adoption of a firm formation and entrepreneurship oriented policy.

In conclusion, ICT and globalization are driving high wage countries and regions to focus economic development policy on the creation of even higher wage jobs and the maintenance of an environment that achieves competitiveness via innovation and high-end technology activities. That is where high wage developed countries have a comparative advantage.

The general argument is illustrated in Figs. 1 and 2 where the rise of technology (ICT in particular) is seen to initially contribute to greater information access or reduction in information externalities. Factor price or cost differ-

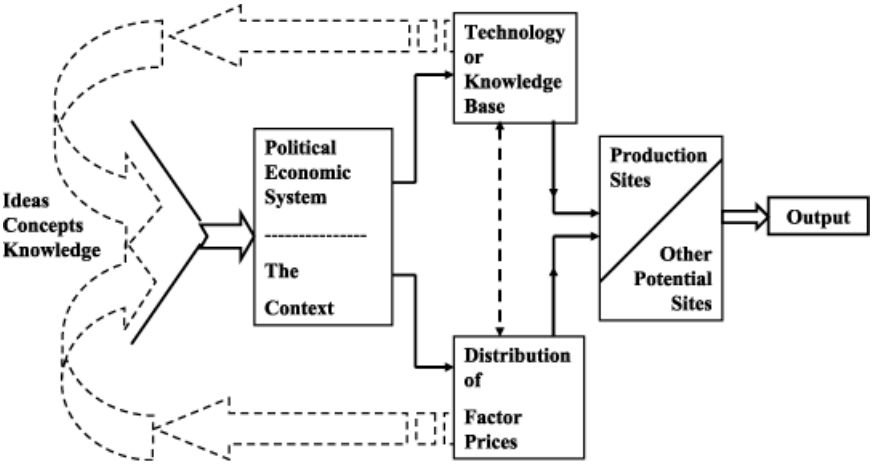

Fig. 1. Time T_1

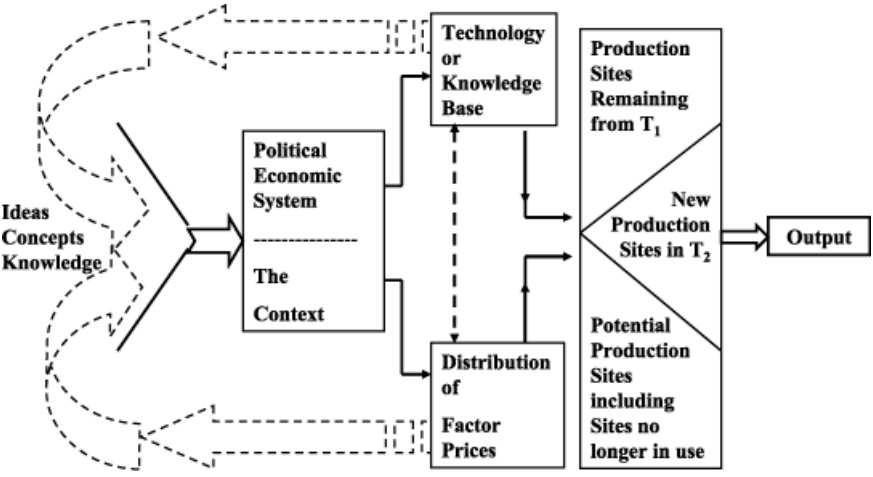

Fig. 2. Time T_2

entials resulted and in turn increased trade and offshore plant relocations from the more advanced countries. Political and social changes in Eastern and Central Europe and in East and South Asia (China, India and Viet Nam) reduced investment risk in these areas. This in turn reduced average and, in particular, marginal factor costs for many types of manufacturing and fabrication because vast numbers of low cost and adequately skilled workers were available. So increasing plant relocations occurred and the more advanced countries were left with only two feasible strategies: make domestic plants much more capital intensive; and invest in the creation of high wage and high employment industries. Both strategies have been pursued. The focus in this paper is on the latter.

Faced with the aforementioned competitive landscape, regions have increasingly adopted and developed firm formation policies. Theory (Schumpeter 1936, 1942; Kirzner 1973) and experience (Birch 1979) argue that the majority of new jobs are created in small companies and start-up ventures. While there is some debate on this (Harrison 1996), it is difficult to argue against the evidence that the highest rates of entrepreneurship, i.e., new ventures, and job growth, occur in the more technically intense sectors (Armington and Acs 2002), where the large majority of growth has occurred in the U.S. economy over the past decade (Stough and Kulkarni 2001). This provides another reason for the increasing attention that is being focused on venture formation policies.

3. Changing regional economic development policy: Some policy instruments

With stronger emphasis on a general strategy of firm formation, a variety of new policy instruments and approaches have been adopted for implementation. One way to summarize these instruments is offered by Smilor and Wakelin (1990) who were early to recognize the shifting priorities. They describe this bundle of instruments as a nested hierarchical system of factors called smart infrastructure. Consistent with the above assessment, they argue innovation and economic growth are products of the successful promotion of technology intensive economic efforts (Smilor and Wakelin 1990, p. 53). Their view begins with an assumption that technology focused economic activities are catalytic and generative.

There are four central elements of their model: talent, technology, capital and know-how (Fig. 3). These are each erected on sets of environmental conditions as illustrated in Fig. 4 and each of these, in turn, upon specific potential public and non public policy opportunities and instruments (Fig. 5). This system is heavily weighted toward soft infrastructure elements and policies that are tied to venture development and growth in the more technology intense industry sectors. As such, the model can be used to identify policy options for implementing innovation and entrepreneurship and innovation dominated firm formation strategy. It also could be used to evaluate and perform gap analyses of existing conditions and policies.

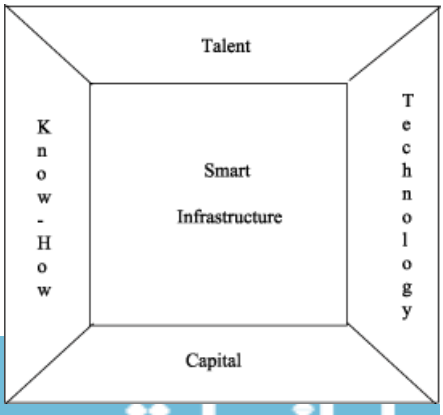

Fig. 3. Key factors in the development of a smart infrastructure. *Source:* Smilor and Wakelin (1990)

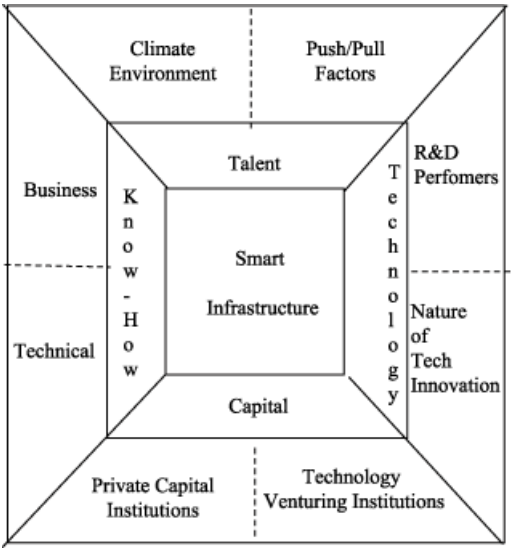

Fig. 4. Environmental conditions. *Source:* Smilor and Wakelin (1990)

4. Leadership and regional economic development

The need to build and create new and different strategic policies almost always arises because of a crisis that is not easily or well managed with the existing policy regime. This is the case, for example, with security policy following the September 11, 2001 terrorist attacks in the U.S.A., and with the policies used to manage economic growth and sustainability of national and, more specifically, regional economies. Leadership for the development and implementation of strategic policy is needed in the face of crises that cannot be effectively addressed by existing policy regimes. The above analysis suggests that the more advanced regional economies are facing a crisis that begs for a different policy emphasis, i.e., a focus on firm and venture formation policies. While the need for strategic regional economic development leadership is high, there is little literature on its role in regional economic development. The following summary of some recent work offers some insight.

Stough (2001) and earlier, DeSantis and Stough (1999), concluded from a review of the leadership and development literature that there is a tendency for identifiable local (leadership) groups to emerge and cooperate to influence the regional economic future of the community. On the basis of this review, leadership was defined as "the tendency of a community to collaborate across sectors in a sustained, purposeful manner to enhance the economic performance of its region" (Stough 2001, p. 35). At the same time it was recognized that communities vary in the level of available resources, i.e., the better endowed a region is, the better it should perform. But it is not just the sum total of quantitative resources (hard and soft) that exist that is most important. Rather, it is the availability of slack or discretionary resources that is critical. Cyert and March (1963, p. 36) define slack resources, from the perspective of the firm, as the difference between "the resources available to a firm ... [organization] ... and the total necessary to maintain [it]." Slack resources define an organization's excess resources. This excess or slack is

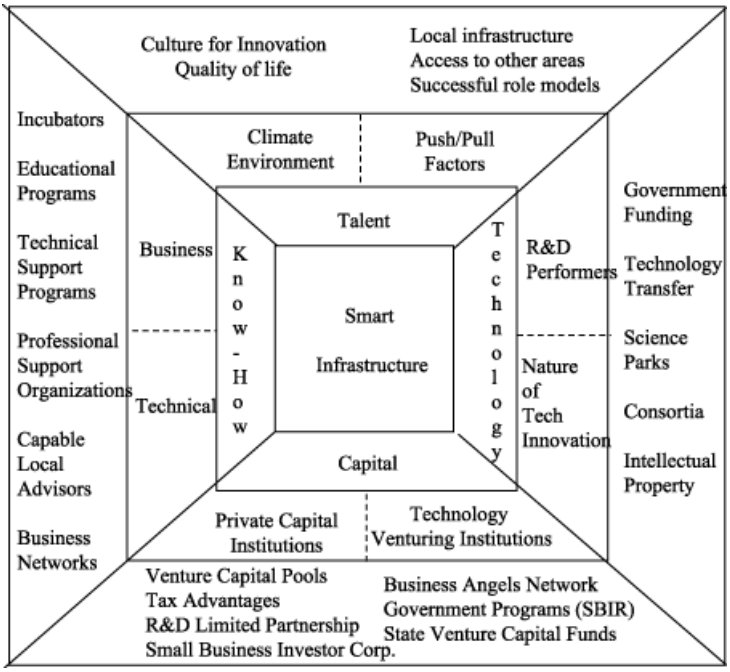

Fig. 5. Policy implications. *Source:* Smilor and Wakelin (1990)

the source of voluntary contributions to civic activities, or locally based and focused community efforts by local public, private and non-profit organizations. Thus, resource endowments may be defined for communities or regions as the aggregate concentration of public, private and non-profit organizations' capacity to voluntarily commit resources to economic development. Resource endowments may be defined as the summed total of the slack resources of a region's organizations.

These definitions of leadership and resource endowments enabled DeSantis and Stough (1999) and later Stough (2001) to formulate a leadership oriented model of regional economic development as presented in Fig. 6. In this model, once exogenous factors and economic structure are controlled for, regional economic performance depends on leadership and resource endowments. As such the model views leadership as a factor that amplifies the important role of the resource base in economic development.

The model was tested using a sample of 35 metropolitan regions in the U.S. Multiple operational definitions were used to calibrate the model (Fig. 7) with cross sectional data (static model) and across time periods (dynamic model) using multiple regression analysis. Path analysis was also used to test the hypothesis that leadership amplifies the basic effect of resources. The leadership variable was found to make a statistically significant contribution to the explanation of economic performance and one that amplified the resources effect. In short, when holding resources constant, strong leadership strengthened economic performance.

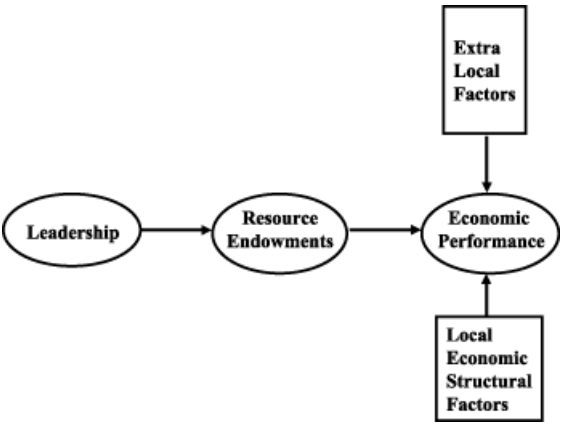

Fig. 6. Path model

This research may be the first attempt to quantify the relationship between leadership and regional economic development. DeSantis and Stough (1999) and Stough (2001) note that there are questions about how the variables in the model were operationalized, the lag period adopted for testing the dynamic model and the need for a multi-period specification for the dynamic model test that used only a two period lagged formulation. Yet, this analysis supports a conclusion that the leadership variable is important and offers a benchmark for investigating its significance and relevance for regional economic analysis. Further, given that some evidence now exists to support the argument that leadership is an important ingredient in regional economic development, it is reasonable to assume that it is also a worthy focus for policy. For example, if regional economic development policy needs to be more venture formation and entrepreneurship oriented then leadership will be needed to help its development and deployment because focusing on firm formation and entrepreneurship policy is at odds with the more traditional or accepted firm attraction and infrastructure investment policy approaches.

5. Information and knowledge needs

With firm formation and entrepreneurship oriented economic development policy there are new but more importantly, higher quality information and knowledge needs. These range from understanding better the performance of the economy and its structure and how to forecast aggregate and structural change under different policy scenarios. Leadership is enhanced when it has access to superior information about the economy, its performance, and its likely future performance. Below several new techniques and methodologies for improving the quality and usefulness of information for economic development planning and policy are presented to illustrate some possibilities.

5.1. Multi-sector analysis (MSA)

Despite more than 20 years experience with strategic planning in numerous large and small regional settings, standard practice often fails to provide the

Economic performance measures

Total region 1990 employment / Total region 1990 population	=	Local employment
Total region 1990 earnings / Total region 1990 employment	=	Local earnings

Resource endowments measures

Total region 1990 number of corporate headquarters (Total region 1990) / 1,000,000 population	=	Number of corporate headquarters
Total region 1990 corporate-wide employment of all corporations headquartered in the region (Total region 1990)/ 10,000 population	=	Employment of corporate headquarters
Total region 1990 number of all central offices of financial institutions (Total region 1990)/ 1,000,000 population	=	Number of financial institutions
Total region 1990 number of colleges and universities (Total region 1990)/ 10,000 population	=	Number of colleges and universities
Total region 1990 enrollment of all colleges and universities based in the region / Total region 1990 population	=	Enrollment of colleges & universities
Total region 1990 personal income (dollars) / Total region 1990 population	=	Level of personal income

Leadership measures

Total region 1990 united way dollar contributions / Total region 1990 population	=	Voluntary community effort
(1990 number of social service organizations based in the region + 1987 number of selected service organizations based in the region) / Total region 1990 population	=	Number of voluntary community orgs.
(1190 expenditure of social service orgs. Based in the region + 1990 expenditure of selected service orgs. Based in the region) / Total region 1990 population	=	Expenditures of voluntary community orgs.
Total region 1990 economic development budgets / Total region 1990 population	=	Economic development effort

Fig. 7. Operational definitions

planning process with a full range of timely information on infrastructure and on industry sector specific capacities and potentials. Further, practice often fails to systematically engage (or debrief) senior officials and decision makers from major industrial sectors of a region in the planning process in more than a superficial way. This is a particularly important problem because industry leaders know the region's industries in terms of basic practice, supply chains, current investment patterns and potential opportunities for new products and opportunities. They also often understand infrastructure bottlenecks that impact their businesses. Thus, many of those with the most important and critical information for the planning process are often left out because time is a valuable commodity for senior industry leaders and it is difficult to schedule them into the lengthy and sequential process that strategic planning has often been.

Work by Roberts and Stimson (1998) proposes a methodology called Multi-Sector Analysis (MSA) for addressing these problems and establishes a platform for change to "re-engineer" the region for the future. It involves mobilizing pivotal actors or facilitators and agents of change and it incorporates standard methods and tools of regional economic analysis, but adds to these, multi-sectoral analysis (MSA) and industry cluster analysis. MSA helps to better identify the core competencies of a region, enhance its resource endowments, infrastructure competitiveness and marketing intelligence, and assess regional risk. Economic possibilities for the future are identified through statements of strategic intent, identification of industry clusters for development and the specification of a strategic framework and related elements. Within this approach and vital to the development and implementation of strategy, is the participation of major decision makers in industry sector groups. These groups are organized so they are representative of a region's major economic base industrial sectors, and are composed of senior officials of companies in these sectors, university researchers with appropriate sectoral specializations, and other government and non-profit industry-specific officials. Core or central industry sectors are determined through analysis of employment, investment and revenue data obtained through government sources such as in the U.S., the Bureau of the Census, County Business Patterns; Department of Labor; Bureau of Economic Analysis or private sector data sets like those provided by Dunn & Bradstreet, Inc. and InfoCom.

Techniques such as frequency distributions, location quotients, shift-share, input-output and other econometric modeling approaches may be used to identify and target a region's core industries, i.e., those that are large and/or growing (or declining rapidly) and, in particular, to identify clustered industry groupings. Executive panels are then formed with senior officials from these industry groups. Most importantly these should come both from within and outside the region and external to it because most regions are dependent on decisions made by organizations both inside and out of the region.

An application of the MSA methodology to the Far North Queensland region in Australia was the first and most robust test of the methodology. This work appears in Roberts and Stimson (1998). Here, a shortened application of the methodology as reported in Stough (2001) and designed for rapid implementation and result generation, is described for the Northern Virginia region.

5.2. *The Northern Virginia case study*

Data provided in Fig. 8 illustrate the use of some of the traditional quantitative methods employed in regional analysis to target and illustrate the major industries in the Northern Virginia part of the U.S. National Capital region. Industry groups were organized to participate in a series of structured sessions in which an objective was to undertake a multi-sectoral analysis (MSA) of the region and assess the performance of its industry sectors.

In the Northern Virginia study a competitiveness survey instrument was used to elicit responses from group members on many regional competitiveness factors including the quality of the region's hard and soft infrastructure (Fig. 9). Survey respondents were selected from industrial directories and from economic development agency databases to ensure that they represented senior leaders from the region's major export base industry groups. Respondents were asked to evaluate the region's competitiveness from the perspective of his/her industry. The findings are arrayed in Figure 9 by the 11 major economic sectors for this region (column headings) and by 35 competitiveness and infrastructure factors (row headings). The data provide insight into the overall assessment in terms of the competitiveness factors and by industry. They also may be used to assess the region's strengths and weaknesses by specific competitiveness factors or industries or both.

The next step in the MSA process as implemented in Northern Virginia was the presentation of the findings of the survey analysis to the panels representing the major export base industrial sectors. This presentation also included data showing demographic and economic trends derived from archival sources. The survey data is expert response data as it was derived from senior officials (experts) representing the region's major industries. Each panel was provided with the summary evaluation data from its sector, e.g., aerospace, information

Rank(in terms of employment in 1993)	SIC	Description	NoVA Employment in 1993	% Change 1988-93	Location Quotient 1988	Location Quotient 1993
	70	Services Total	334,082	18.82%	1.24	1.32
2	8711	Engineering Services	20,434	-17.32%	6.01	4.41
3	8742	Management consulting services	16,671	71.42%	9.35	11.75
5	7371	Computer Programming services	14,696	36.64%	12.90	****
9	8731	Commercial Physical Research	9,864	10.94%	5.85	5.97
10	7373	Computer Integrated Systems design	7,618	-0.35%	****	****
11	7374	Data Processing and Preparation	6,959	8.29%	4.91	4.85
14	8733	Noncommercial research organizatio	5,581	5.18%	4.43	4.17
16	7379	Computer related services, n.e.c.	5,173	156.22%	4.05	8.00
17	8741	Management Services	5,093	16.46%	2.78	2.65
20	8748	Business consulting, n.e.c.	4,772	238.20%	****	8.77
21	7372	Prepackaged Software	4,729	23.05%	****	****
37	7378	Computer maintenance and repair	1,689	61.47%	4.92	6.10
38	8071	Medical Laboratories	1,665	13.65%	1.87	1.85
58	7377	Computer rental and leasing	912	157.63%	4.70	12.46
65	7376	Computer facilities management	714	99.44%	****	****

Fig. 8. Industry target measures

	Sectors											
Competitiveness Factors	Aerospace	Biotech	Information Technology	System Integrator	Telecomm	Transport	Association	Real Estate	Finance	Professional Services	Tourism	**Mean Across Factors**
Adequate Highway System	3.429	4.000	2.143	3.542	3.625	3.091	3.556	4.500	3.444	3.750	3.667	**3.552**
Scheduled Air Service	4.000	4.375	2.571	3.292	3.500	3.182	4.000	3.250	2.889	4.250	4.667	**3.510**
Telecommunications	4.571	4.625	4.429	4.375	4.375	3.546	4.000	3.250	4.111	4.250	3.667	**4.095**
Environmental and Waste Mgmt.	2.570	3.000	1.857	2.250	2.625	1.818	2.667	3.167	2.000	2.000	2.333	**2.400**
Regional Quality of Life	4.143	4.125	3.571	3.958	4.500	3.273	3.444	4.417	3.889	3.500	3.833	**3.905**
Finance	**3.00**	**4.31**	**2.64**	**2.81**	**3.19**	**2.09**	**2.28**	**2.96**	**3.17**	**1.38**	**1.92**	**2.78**
Availability of Financing	3.143	4.375	3.000	3.125	3.625	2.455	2.556	3.417	3.667	1.750	2.000	**3.095**
Venture Capital	2.857	4.250	2.286	2.500	2.750	1.727	2.000	2.500	2.667	1.000	1.833	**2.457**
Human Resource Development	**4.00**	**3.45**	**3.49**	**3.94**	**4.18**	**2.45**	**2.98**	**3.25**	**3.62**	**2.80**	**3.87**	**3.50**
Higher Education /Training Svces	4.000	3.375	3.286	3.958	4.125	2.455	2.778	2.333	3.667	2.250	2.833	**3.286**
Availability of Skilled Labor	3.571	3.500	4.000	4.375	4.500	2.182	3.222	3.833	3.556	2.750	4.167	**3.705**
Availability of Prof. Employees	4.429	4.000	4.429	4.500	4.375	2.909	3.667	3.250	4.000	3.500	3.500	**3.924**
Flexible Labor-Mgmt. Relations	4.000	2.750	2.429	2.833	4.000	2.091	2.222	3.250	3.333	2.750	4.333	**3.010**
Competitive Wage/Salary Structure	4.000	3.625	3.289	4.042	3.875	2.636	3.000	3.583	3.556	2.750	4.500	**3.591**
Technology and Development	**2.14**	**3.15**	**2.11**	**2.06**	**2.63**	**2.60**	**1.69**	**1.70**	**1.60**	**0.95**	**1.83**	**2.06**
University Research Programs	2.000	2.875	2.429	2.125	2.625	2.273	2.000	1.917	2.000	1.750	1.667	**2.162**
University-Industry Partnerships	2.286	3.625	2.429	2.208	3.125	2.636	1.889	1.750	2.333	1.000	2.500	**2.352**
Federal Research Lab Programs	2.286	3.000	2.429	2.000	2.375	2.182	1.667	1.667	1.111	1.000	2.000	**1.971**
State Research Initiatives	1.857	3.125	1.571	1.833	2.250	3.364	1.333	1.583	1.111	0.500	1.667	**1.810**
Private Research Efforts	2.286	3.125	1.714	2.125	2.750	2.546	1.556	1.583	1.444	0.500	1.333	**2.000**
International Trade Orientation	**3.23**	**2.83**	**2.11**	**2.05**	**2.03**	**1.90**	**1.16**	**2.25**	**2.09**	**0.25**	**2.60**	**2.09**
Current Overseas Trade Activities	3.286	3.375	2.143	2.417	1.750	1.800	1.222	2.333	2.222	0.000	2.667	**2.212**
Foreign Investment into this Region	2.429	2.125	1.286	1.625	1.500	1.400	1.222	2.333	2.444	0.500	3.500	**1.846**
Overseas Investment of Your Firm	2.571	2.250	1.143	0.917	1.750	1.300	0.889	1.833	1.556	0.000	0.500	**1.346**
Business Alliances (w/U.S. Firms)	3.857	3.250	3.714	3.250	3.250	3.000	1.333	2.500	2.444	0.500	3.667	**2.894**
Business Alliances (Foreign Firms)	4.000	3.125	2.286	2.042	1.875	2.000	1.111	2.250	1.778	0.250	2.667	**2.144**
Government	**3.64**	**3.63**	**3.61**	**3.92**	**3.81**	**2.84**	**3.34**	**4.23**	**3.89**	**3.13**	**4.58**	**3.73**
Local Regulation of Business	3.429	3.375	3.571	3.917	4.000	3.000	3.444	4.167	3.556	4.000	3.833	**3.686**
General Business Climate	3.714	3.875	3.714	4.250	3.875	2.727	3.375	4.417	4.444	2.750	5.000	**3.914**
Local Econ. Development Efforts	3.429	3.625	3.143	3.250	3.500	2.636	3.000	4.250	3.889	1.750	4.667	**3.410**
Local Tax Structure	4.000	3.625	4.000	4.250	3.857	3.000	3.556	4.083	3.667	4.000	4.833	**3.904**
Regional Economic Strengths	**3.46**	**2.83**	**3.76**	**3.54**	**3.54**	**3.06**	**2.07**	**3.94**	**3.67**	**2.17**	**4.22**	**3.36**
Performance of your Industry Sector	3.667	2.875	3.857	4.000	3.625	3.182	2.000	4.000	3.778	2.500	4.833	**3.567**
Strength of No.VA Regional Econ.	3.143	2.875	3.857	3.542	3.714	3.091	2.444	4.500	4.222	2.500	4.833	**3.558**
Cross-Industry Information Flow	3.571	2.750	3.571	3.083	3.286	2.909	1.778	3.333	3.000	1.500	3.000	**2.962**
Your Firm's Management Charact	**3.79**	**3.25**	**3.98**	**3.94**	**3.92**	**3.32**	**3.04**	**3.60**	**4.04**	**2.92**	**3.61**	**3.65**
Customer Service/Product Quality	3.857	3.375	4.571	4.833	4.625	3.818	4.000	4.667	4.889	3.500	4.833	**4.381**
Inter-Business Networking	4.143	3.000	4.286	3.708	3.625	3.091	3.000	3.333	4.444	2.500	4.333	**3.600**
Available Management Consultants	2.714	2.625	2.857	2.609	2.250	2.818	2.222	2.417	3.000	2.000	1.500	**2.519**
Marketing Capabilities	4.000	3.250	4.000	4.000	4.250	3.455	2.778	4.167	3.889	2.250	4.333	**3.762**
Entrepreneurship	3.429	3.500	3.857	4.125	4.250	3.182	2.667	4.000	3.889	3.000	3.500	**3.686**
Info/Telecommunication Systems	4.571	3.750	4.286	4.375	4.500	3.546	3.556	3.000	4.111	4.250	3.167	**3.933**
Mean Through Firm Sectors	**3.393**	**3.377**	**3.088**	**3.226**	**3.375**	**2.681**	**2.517**	**3.161**	**3.145**	**2.157**	**3.305**	

Fig. 9. Response to how factors affect the performance of your industry in the Northern Virginia region. Values are avergage scores of responses to 5 point Importance ratings (5 is most important)

technology, professional services, and tourism. A major task in this meeting was for the panel participants to verify and validate and as necessary, modify the survey findings to enhance accuracy. For example, local economic development efforts were viewed as somewhat lacking by the information technology panel. Discussion with panel members indicated that this panel was appreciative that the development community was making a great effort to reduce and eliminate the personal property tax levied on their industry (unfairly in their view) but these efforts had not been successful, i.e., the tax was still in place.

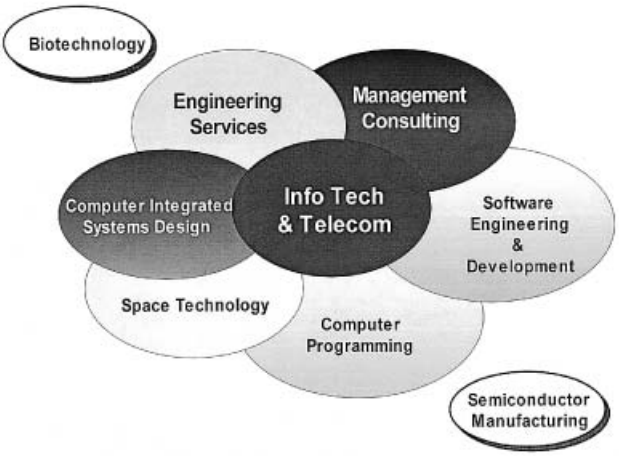

Fig. 10. Core of the Northern Virginia economy

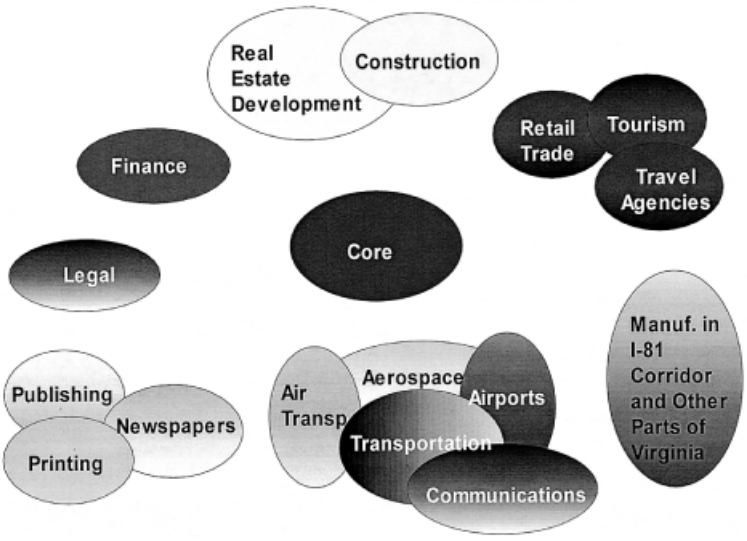

Fig. 11. Core and other important sectors of the Northern Virginia economy

Following the verification and reinterpretation of the survey findings the panels then identified new business opportunities for the future of their sectors, and assessed the risk associated with developing these options. From this exercise it was possible to create a base line conceptual model of the region's core economy (Fig. 10), a model of core related but allied industry clusters (Fig. 11) and alternative proposals for deepening, stretching, and leveraging various combinations of sectors. An illustration of potential broadening and leveraging opportunities for the ICT sector appear in Fig. 12 and for tourist

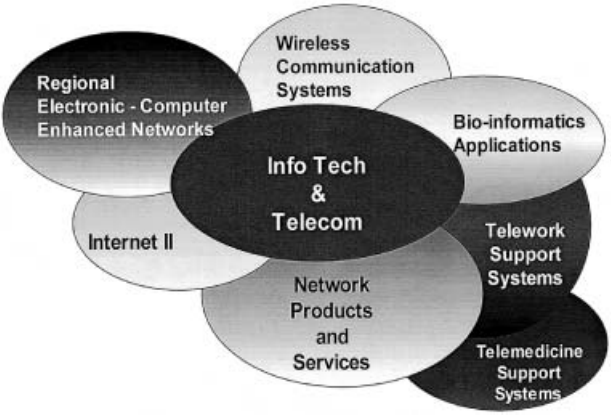

Fig. 12. Information tech & telecom cluster

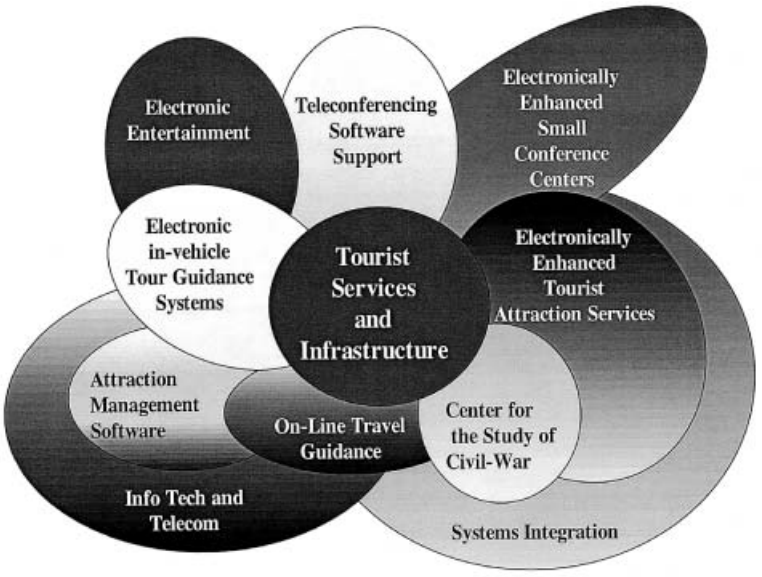

Fig. 13. Tourism cluster

services in Fig. 13. Potential sectoral deepening strategies or concepts for ICT, tourism and finance appear in Figs. 14, 15 and 16, respectively. These illustrations show how expert information can be introduced into the strategic place planning and management process. By showing possibilities the foundation for a firm creation and entrepreneurial oriented development policy is laid.

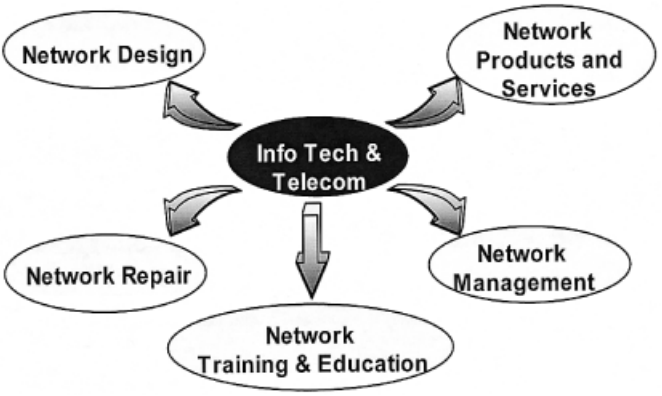

Fig. 14. Sectoral deepening (specialization) development

Fig. 15. Sectoral deepening (specialization) development

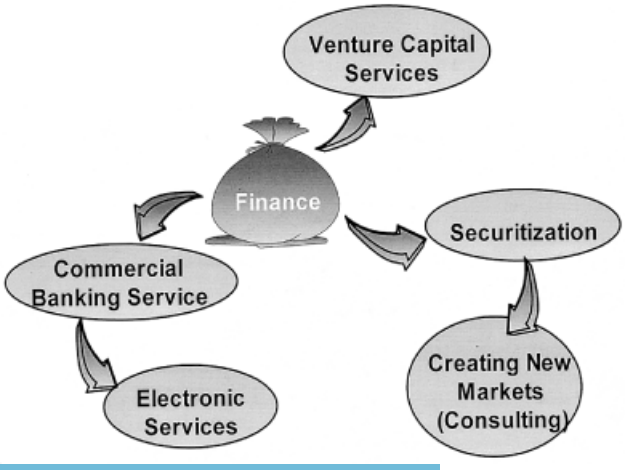

Fig. 16. Sectoral deepening (specialization) development

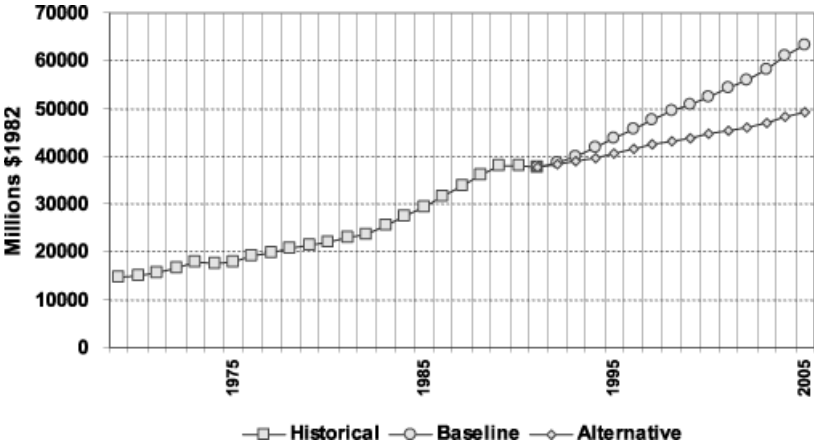

Fig. 17. Northern Virginia gross regional product: Baseline and alternative forecast

5.3. Forecasting regional economic conditions: Regional economic modeling

In the late 1980s Geoffrey Hewings et al. (1998) at the Regional Economic Development Laboratory (REAL) developed an econometric input-output model of the Chicago economy modeled after work later published by Conway (1990). An interesting feature of this model was that it operated in a Windows environment and could be used for rapid estimation of the economic effects of simulated interventions such as cyclical change, disasters and large-scale investments such as construction of new stadia or other infrastructure elements. Harry Campbell and Roger Stough with the help of Hewings and the REAL team developed a similar model of the U.S. National Capital Region economy called NCREIM (National Capital Regional Economic Input-Output Model) and then later other models for sub-parts of the region such as NVREIM for Northern Virginia. Campbell and Stough (1997) experimented with the model by using it in interactive sessions with groups of industry representatives and other interested officials where alternative economic scenarios were constructed and the effects simulated. To illustrate, a scenario created by one of these groups assumed a five percent reduction in federal spending over a three-year period. Federal spending in the National Capital Region accounts directly for more than thirty percent of the GRP and given that the federal government was downsizing at the time, this was not unrealistic. Figures 17 and 18 show a baseline (projection from recent trends) forecast for the region's GRP and employment, and the forecast for the federal spending reduction scenario. This form of scenario analysis is important because a group of industry representatives created the scenario, it was programmed, the analysis run with NCREIM and the results presented in the form of difference curves like those shown in Figures 17 and 18 all in less than 3 minutes. This modeling technique enables the testing of alternative economic hypotheses rapidly with feedback provided almost immediately. It also supplies immediate, clear and easily grasped feedback about the economy and its likely performance. Thus it may enhance the quality of strategic planning and development decisions and practice over earlier models.

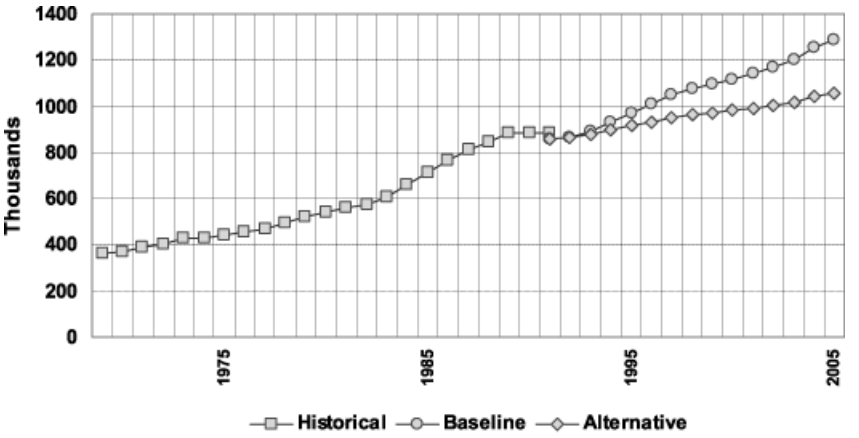

Fig. 18. Northern Virginia employment: Baseline and alternative forecast

5.4. Forecasting regional economic conditions: Leading and coincident indexes

A system of leading and coincident economic Indices was designed and developed by Fuller (2002, p. 16) to forecast cyclical change in the Greater Washington Regional Economy in 1990. Since that time empirical results have been continuously updated and published on a monthly basis for the Washington metropolitan region as well as for other metropolitan areas in the U.S. and Portugal. Below a recent application of the index system is described to illustrate its utility.

The Washington Leading Economic Index provides the only consistent measure or forecast of the Washington economy's near-term (9–12 months) economic performance. The data for this forecasting instrument begins in 1978 and relies on the performance of five core indicator variables (derived from more than 50). The 24-year period from 1978 spans three recessions and two other smaller slowdowns. The leading index and the overall index as well as the component indicators can be obtained at cra@gmu.edu.

As in the past, the Leading Index anticipated the 2000–2002 economic slowdown by 11 months. It peaked in January 2000 and moved downward with an overall 2.2 percent drop by January 2001. This gradual weakening accelerated downward in the final quarter of 2000. The decline continued during 2001 as shown in Fig. 19. Since September, 2001 the Index appears to have rebounded as gains have been occurring since then.

The Leading Index's downward trend dating from early 2000 illustrates a slowing of the region's economy. The Coincident Index, which measures the current performance of the economy, peaked in November of 2000, ten months after the leading index peaked. Immediately after November, the Coincident Index dropped rapidly for three months, appeared to stabilize in March of 2001 and then fluctuated slightly during August. With gains in June and August, it appeared that the economy would re-accelerate.

The local economic impacts of the September 11th terrorist attacks were immediately reflected in both the Leading and Coincident Indices. While the economy's performance continued to reflect these negative impacts in October, the Leading Index returned to an upward track. In November, the Coincident

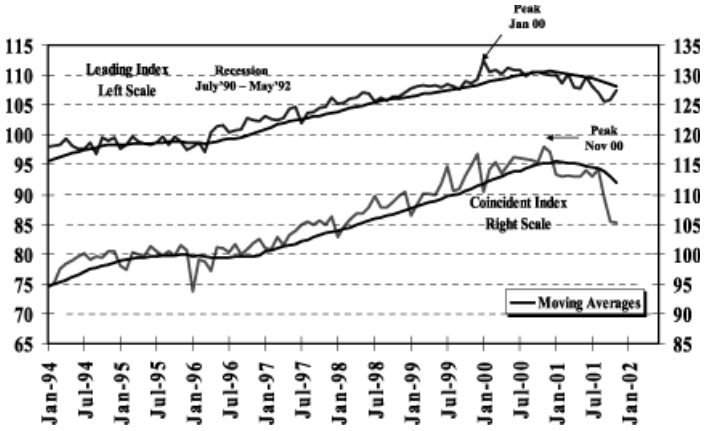

Fig. 19. The Washington DC area business cycle indicators. *Source:* GMU Center for Regional Analysis (cra@gmu.edu)

Index was negative for the third consecutive month and down some 10.7% from November, 2000. However, the decline in November, 2001 was only 0.13% with job growth and non-durable retail sales components posting gains while consumer confidence, domestic airport passenger volume were down. As the leading index continued to rise and the short-term negative effects of the September 11th events dampened out, the region's economy moved onto a course of increasing growth.

This story illustrates that the Fuller index system identified the downturn in the regional economy nearly one year out. Area businesses, industry and government officials had ample and reliable notification of the downturn well in advance. The forecast is quite reliable as the instrument through back casting and other cyclical experiences has, in all cases, provided notice of between 9 to 12 months in advance of a downturn or recession. In short, with well over a decade of experience, local officials have learned to increasingly trust this instrument's results. Thus, they have better information than their counterparts in most other metropolitan regions that do not have this indexing system.

5.5. Geographic Information Systems: Functional and spatial cluster analysis

Geographic Information Systems (GIS) promise to provide an integrated information and analysis tool that will enable a leap forward in the ability to understand spatial information and in a way that may reduce information externalities in regional economic development policy making and planning. Here, an analysis of the relationship between functional and spatial industry clustering in three U.S. metropolitan regions is presented in summary form to illustrate how GIS is helping to provide higher quality information for strategic economic development policy, practice, and management. A more complete analysis appears in Stough et al. (2002).

For this analysis 33 technology sectors at the four-digit level were identified or defined as the core of the information and communications technology (ICT) industry sector. These were selected because substantively they are the

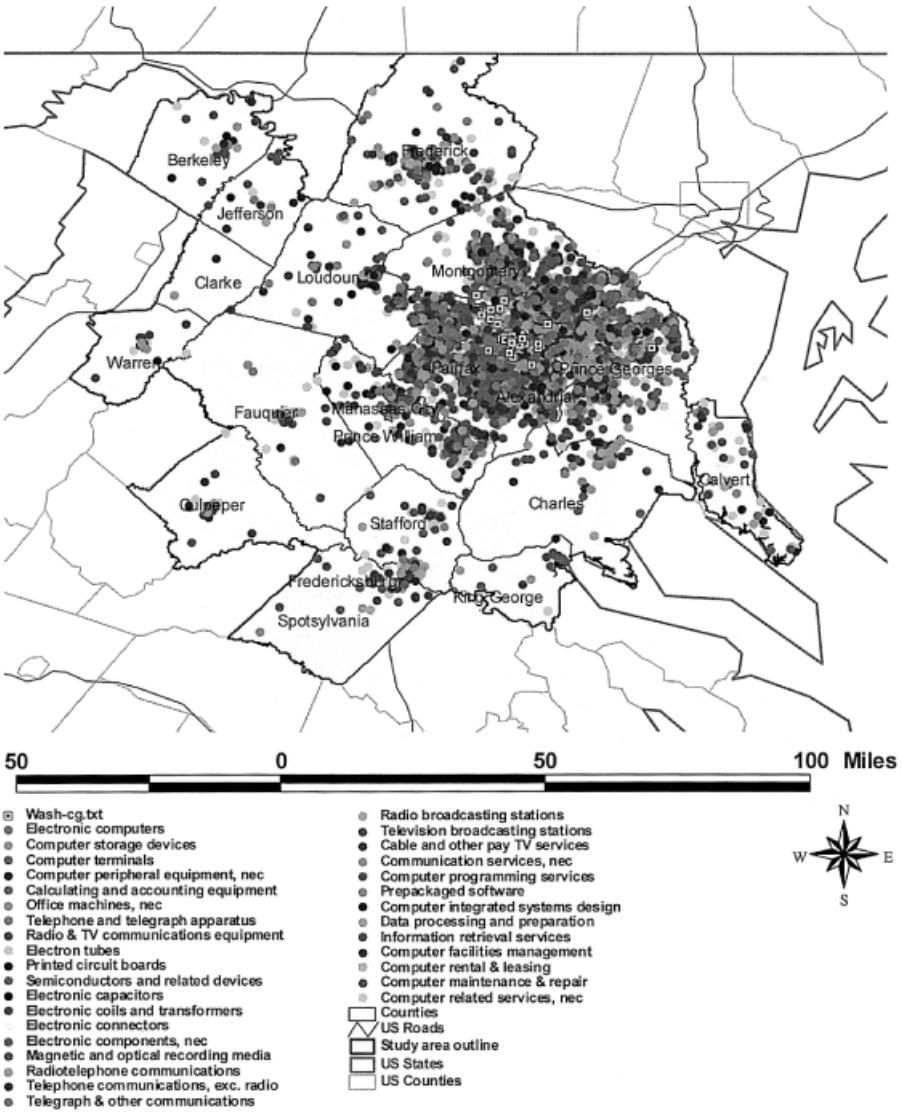

Fig. 20. Washington D.C. (VA, MD, WV, Wash. D.C.) MSA: Technology business by industry

components that define the ICT industry and they have significant indicators of technology intensity (above average engineering employment and levels of R&D expenditures). All firms in each of these sectors for the Austin, TX; Boston, MA; and Washington, D.C. metropolitan areas were located geographically and plotted on the respective maps (Figs. 20, 21 and 22). Centroids for each of the 33 distributions of the industry sectors' firms were computed and also plotted on the maps (see Figs. 20, 21, and 22). Then, distances between the centroids were computed and regressed on the respective input coefficients for the various pairs of sectors. The simple correlation coefficients

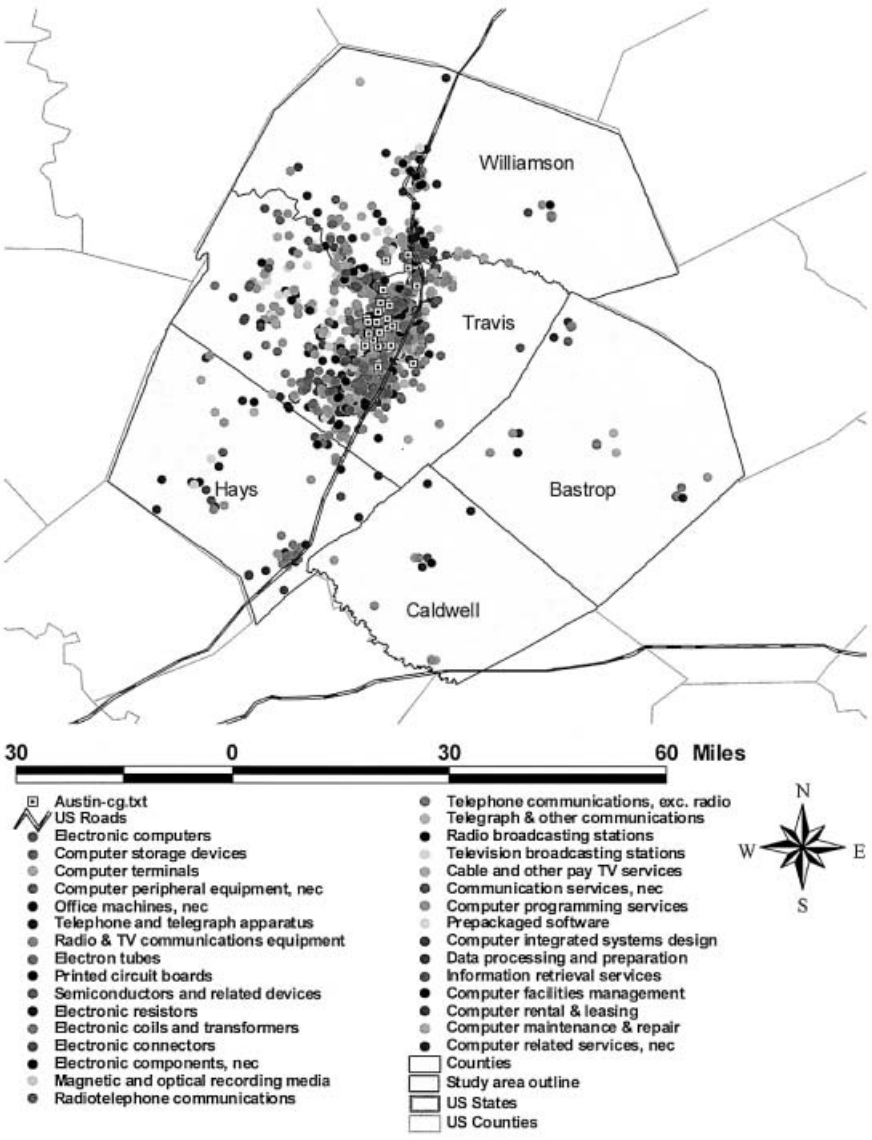

Fig. 21. Austin-San Marcos (TX) MSA: Technology businesses by industry

between aggregations of these distances and their respective summed input coefficients were −0.5008 for Austin, −0.7335 for Boston and −0.3890 for Washington. The importance of this analysis and the findings are that they suggest a strong relation between the geographic clustering of firms and their level of non-geographical or functional interaction (level of buying and selling to each other).

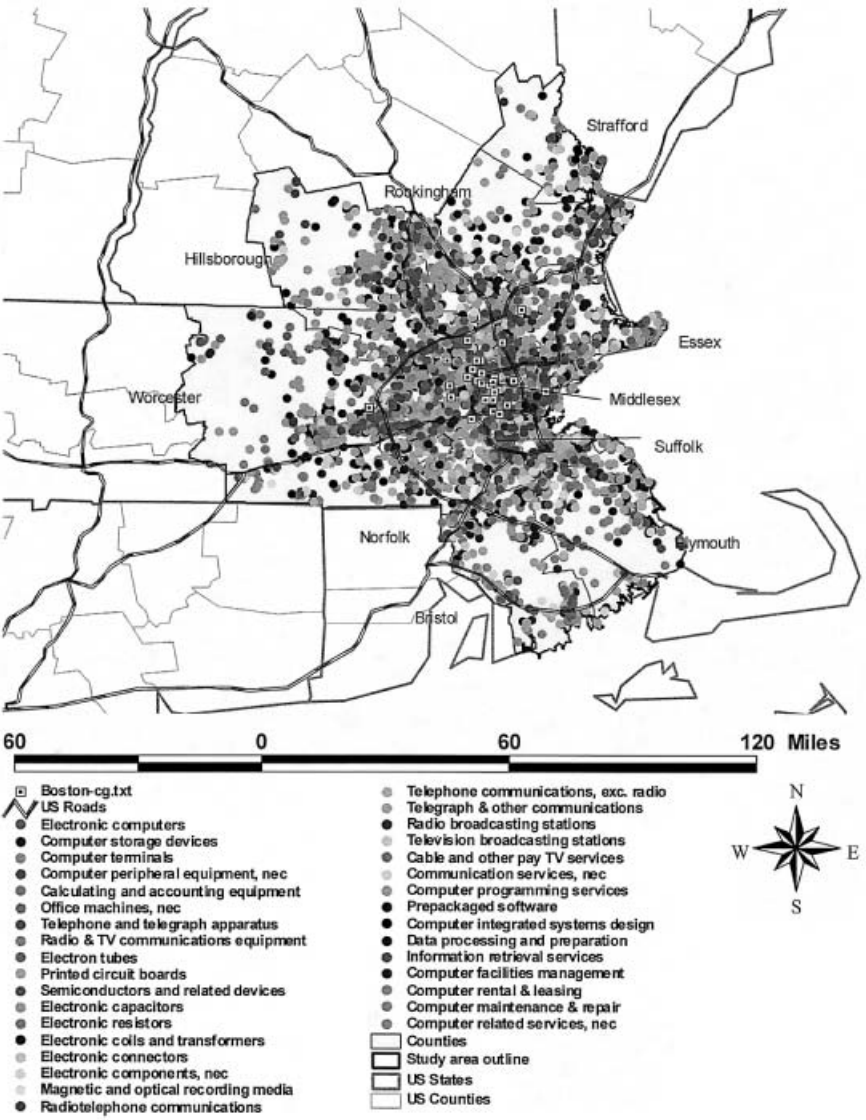

Fig. 22. Boston (MA, NH) MSA: Technology businesses by industry

The relation between spatial and functional clustering is much stronger for the more mature Boston economy, suggesting that over time there is a spatial "tightening up" between sectors that are functionally dependent. Washington and Austin have newer technology sectors and thus the relationship is less "tight." Enterprising commercial real estate agents could conceivably use this information to find and market sites that provide better locations for companies that belong to higher interaction industry sectors. Policies could be

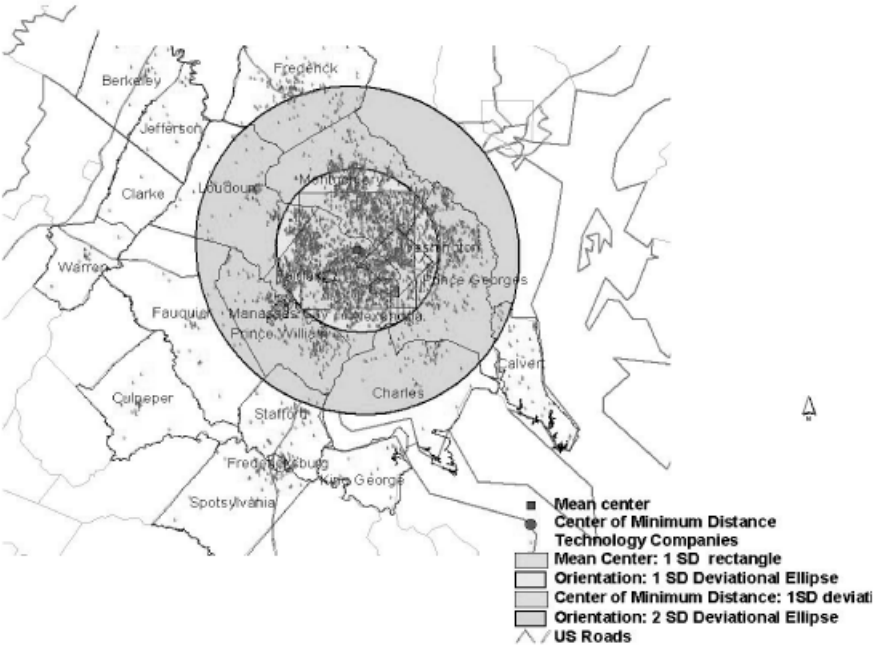

Fig. 23. Spatial analysis of technology companies in the Washington D.C., PMSA

adopted to channel location decisions on the part of firms belonging to highly dependent industries to more proximal sites. Proximal locations may be viewed as enhancing the probability of functional interaction (buying and selling, and information exchange) and thereby increasing the potential level of idea and knowledge exchange (positive information externalities) and opportunities for new ventures. Finally, cluster orientation analyses (Figs. 23–25) provide a framework for examining relationships between surface transport and other physical infrastructure, business locations and clustering.

6. Summary and conclusions

This paper set out to explore the reasons for an increased emphasis in regional economic development policy and practice on firm formation and entrepreneurship oriented policy. The ICT technology revolution and concomitant globalization were found to be driving forces for the changing emphasis. Following this assessment instruments for policy formation and program delivery were summarized. Lack of appropriate leadership for development and a need for higher quality information were viewed as primary bottlenecks facing the design and implementation of the new policy perspective. An analysis of the leadership concept argued that it plays an amplifying role in economic development policy at the local/regional level. With respect to information, the several cases analyzed were presented to illustrate how important it is to identify information externalities and to help deal with them.

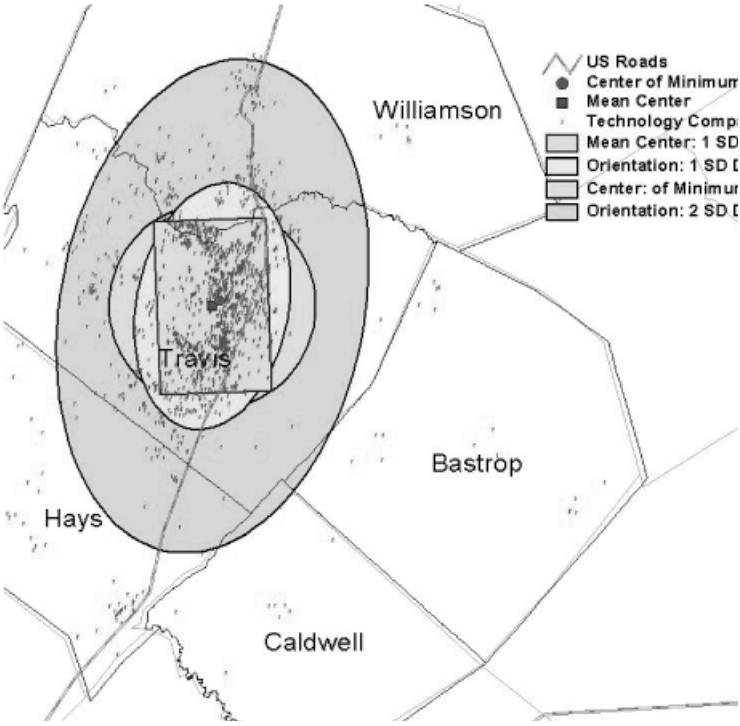

Fig. 24. Spatial analysis of technology companies in Austin MSA

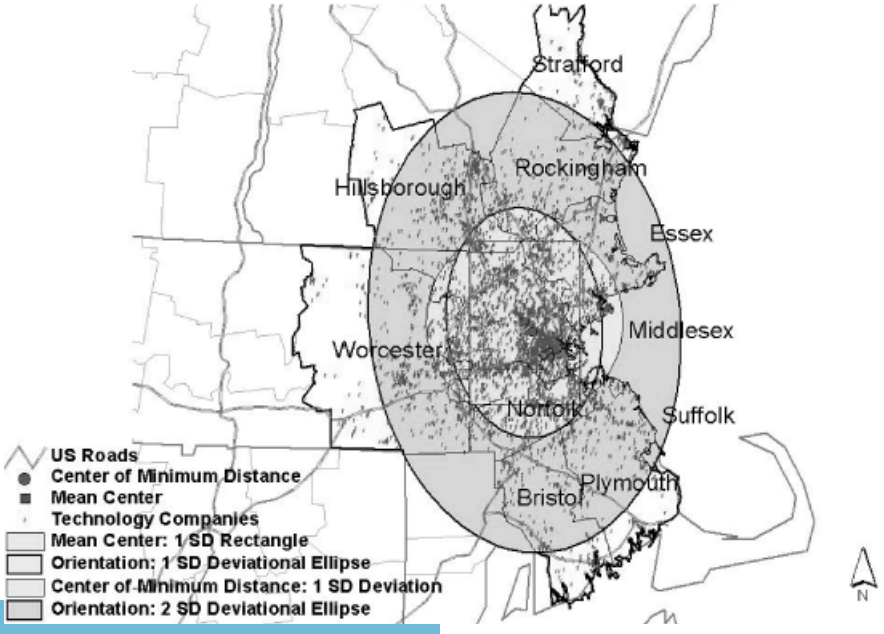

Fig. 25. Spatial analysis of technology companies in the Boston, MA-NH NECMA

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