Introduction

Overview

Economic development strategies must be forward-looking. As the pace of technological advancement accelerates and global economic competition becomes ever more intense, it is increasingly important for cities and regions to look forward to identify opportunities and threats to their economic development. New technologies and changing patterns of demand and supply will reshape the drivers of economic growth. Understanding which technologies will be important in the future, and how they will affect growth prospects is thus a crucial ingredient to regional planning.

What technologies are most likely to contribute to the future economic development of the Kansas City area? The impact of new technologies on local economic development depends on both the opportunities that the technology offers for generating employment growth and wealth creation, and the capacity that the community has to become competitive in the technology.

This report analyzes a broad array of statistical evidence to identify quantitative indicators of the differential opportunities offered by a range of technologies and the local capacities that the Kansas City area possesses to be competitive in each of these technologies.

Available statistical data do not give a full picture by themselves. To see how the picture could be filled out by knowledgeable local participants, this report also describes detailed focus group studies for one particular industry. That industry – biopharmaceuticals and life sciences – was identified by the statistical data as a particularly promising one for the Kansas City area. It is also an industry that has been targeted by Kansas City area leaders in economic development.

Technologies and Industries

Conceptually, it is most appealing to think about the opportunities associated with individual technologies. In reality, however, few of the data sources are organized around technologies. Most of the data is organized instead by industry. Moreover, most research and development activity is conducted by private companies that are players in one or more industries, rather than promoters of individual technologies. Thus the primary method of organizing most of our discussion will be by industry rather than by technology.

Industry classification schemes are not uniform across data sources both because of differences in the level of aggregation, and because of differences in the way that statistical agencies classify the data that they collect. As a result it is not feasible to combine data from different sources into a single index of opportunity or capacity. Instead the report separately examines opportunity and capacity measures for each of several types of data.

Statistical Methodology

**Opportunity** measures national conditions that may make a particular technology promising. These conditions are outside the influence of local technology partners (business leaders, government officials, and university administrators) to control. Opportunity is determined by the interaction of a variety of different forces in the economy. These include economic factors such as the levels of aggregate demand, shifts in patterns of consumer spending and investment behavior, as well as the inherent opportunities offered by the state of scientific and engineering knowledge in particular fields.
Capacity measures factors that predispose the local region toward success in a particular technology. These factors can, at least in principle, be influenced or changed by local technology partners. These factors indicate the ability of the local area to be competitive as a location for establishments in a specific industry or for R&D in a specific technology.

To measure opportunity and capacity, we have identified 6 different indicators—measurable economic quantities—that capture different dimensions of opportunity and capacity. No one of the indicators is a comprehensive or completely reliable measure of opportunities or capacities. But taken together they paint a rich and largely consistent picture of the available opportunities and Kansas City’s ability to take advantage of them.

Focus Group Methodology

The study team conducted three focus groups plus an individual telephone interview with current life science leaders in the greater Kansas City region during winter 2004. The participants included university and institutional researchers, physicians active in research, industry executives, and university research administrators. The purpose of the research was to identify important background information for creating a regional strategic roadmap for life science technology in the Kansas City region. Specifically, the focus groups and interviews sought to answer five important questions:

1. Where does the Kansas City region stand now relative to its competitors in life science technology?
2. What are the barriers to the Kansas City region becoming a leader in life science technology?
3. How can those barriers be removed?
4. What must happen in order for the region to succeed?
5. What specific (niche) opportunities exist in the region within life science technology?

A full description of the research instrument and methodology is given in a separate report, which also gives more complete data on the results.¹

Outline of the Report

This report has two parts. Part One includes six chapters analyzing capacities and opportunities using the six types of data.

- **Chapter 1: Industrial Research and Development.** The distribution of R&D spending by industry reflects businesses evaluation of the potential returns to investment in different areas and provides a good indicator of where future opportunities are likely to lie.

- **Chapter 2: Patents.** The distribution of the number of patents by technology areas indicates trends in the level of invention that reflect technological opportunities.

- **Chapter 3: Venture Capital.** Venture capitalists are keen observers of potential commercial opportunities, and where they choose to direct their funds is an important clue about the potential for future growth opportunities.

- **Chapter 4: Initial Public Offerings.** Similar to venture capital investments, but at a more advanced stage in the development cycle, the distribution of funds raised by IPOs offers important clues about how the market evaluates the prospects for economic success of new ventures in different industries.

- **Chapter 5: Traded Industry Cluster Employment.** Industries producing nationally and internationally traded goods are a key source of differentiation in the composition of local economies. Differences in employment growth across traded industry clusters are an indication of how these clusters of producers are likely to fare in the future.

- **Chapter 6: Employment Projections.** Based on forecasts of likely trends in expenditure patterns and technological innovation, employment projections reflect opportunities for medium-term growth by industry.
Part Two of the report includes three chapters describing findings of the focus groups with respect to biopharmaceuticals and life sciences.

- **Chapter 7: Barriers to Industry Success.** Kansas City-area problems are identified with respect to access to venture capital, availability of top level management, and recruiting to Kansas City, as well as other challenges.

- **Chapter 8: Pathways to a Successful Initiative.** Specific strategies for the Kansas City area are analyzed, including self-reliance and finding niches, with some specific niche opportunities; the advantages of recruiting personnel with a pre-existing Kansas City connection; the usefulness of targeted networking; important next steps; important players; and examples of success.

- **Chapter 9: Moving Forward.** This chapter gives a brief vision of the future.

### Key Findings

**Opportunities.** Several broad areas of technology offer strongly positive national opportunities and emerge consistently across virtually all of the measures of opportunity considered. These are:

- **Information Technology** — comprising a variety of different kinds of software, internet content creation, e-commerce applications, and computer and electronic component manufacturing.

- **Biopharmaceuticals/Life Sciences** — comprising a variety of activities related to the development of pharmaceuticals and medical devices.

- **Telecommunications** — comprising the provision of telecommunications services and equipment, both wired and wireless, as well as data transmission networks.

In addition to these technology-based areas of opportunity, analysis of the data revealed the importance of the service sector as an area of opportunity. In particular:

- Business services
- Financial services, and
- Engineering services emerged from the data as important areas of opportunity. While it is not conventional to think of these as “technology” industries, all of them are heavy users of technology and growth opportunities will come from development of new business models and new organizational processes that will be heavily dependent on taking advantage of advances in technology.

**Capacities.** Although Kansas City is not the dominant player in any of the areas of opportunity identified by the data, Kansas City has established capacities in all of these areas of opportunity. Its greatest strength is in telecommunications, reflecting the effects of the city being the headquarters of Sprint, a major participant in the telecommunications industry and an important locus of local innovative activity. Kansas City has a strong presence in some areas of information technology and biopharmaceuticals. It also has a large chemicals manufacturing industry presence. Its strengths in each of these areas are concentrated in selected sub-fields of these broader industries, however, and additional research is needed to determine how well the area’s strengths actually correlate with areas of opportunity.

Kansas City also has a strong presence in several sub-fields of business services, especially financial services and engineering services and can take advantage of opportunities in these rapidly expanding service sector industries.

Kansas City also has substantial capacity in several industries that do not emerge as areas of great opportunity. Nonetheless these assets may be important factors in regional economic development planning and one could argue that low opportunity scores to date simply mean that these industries have not yet identified how to use emerging technologies to their advantage. In particular, Kansas City has a major concentration in the printing and publishing industry, primarily because of Hallmark. It is also an important center of automotive assembly with two major automobile assembly plants. The value of these assets should not be overlooked in a focus on high-tech industries.
Recommendations

Kansas City appears to be positioned to be competitive in a number of high-tech areas of opportunity, including information technology, biopharmaceuticals/life sciences, and telecommunications. It is not going to be dominant across the board in any of these fields, but it has the potential to develop as a strong center for sub-specialties within these areas. The available data are too coarse to clearly delineate which sub-specialties are most likely to be worth pursuing or what strategies are necessary to promote them. Further investigation is necessary to explore opportunities within these broad fields. However, focus group participants suggested there are local strengths within the biopharmaceuticals/life sciences area for niche activities related to human health, animal health, agricultural chemistry, orphan drug development, animal plant science, and vaccine development.

Focusing on high-tech development areas should not distract attention from other regional strengths. In particular the Kansas City area seems well placed to exploit its capacity in financial services and engineering services to take advantage of these areas of opportunity.

Furthermore, the area’s strengths in printing and publishing and automotive assembly may offer additional opportunities for development, especially if synergies can be identified between them and other areas targeted for development. In particular, specialized information or telecommunications technologies adapted to these areas might be worth exploring.

Focus group participants identified two barriers to biopharmaceuticals/life sciences development as being especially important in the Kansas City area. First, the quantity of venture capital available for biopharmaceuticals/life sciences development continues to be rather limited. Second, there is a scarcity of top-level management with a track record in establishing successful ventures. Success in biopharmaceuticals/life sciences development will substantially depend on the ability of local biopharmaceuticals/life sciences partners to address these needs.

Note

1Kansas City Region Information Technology and Life Science Initiative Focus Group and Interview Report, by Susan M. Mercer, Policy Research Institute Report #270C, April 2004. The report also includes an interview with one Information Technology leader, not described here.