The Kansas City Region: Economic Opportunity in the Heartland

Preliminary Assessment

Robert Weissbourd, RW Ventures, LLC

and

Alen Amirkhanian

Prepared for the

The Brookings Institution Metropolitan Policy Program

April, 2005

Table of Contents

Table of Figures

Acknowledgements

This report arises as part of ongoing research and development activities by the City Civic Council of Greater Kansas City and the Mid-America Regional Council (MARC) aimed at strengthening the Kansas City metropolitan area economy. Brookings and the authors are grateful to the Kauffman Foundation for their support of this project. They would also like to thank MARC for their assistance getting this project off the ground. The authors would particularly like to thank Frank Lenk for his early guidance and Craig Hakkio, senior vice president and director of research at the Kansas City Federal Reserve Board, for his insightful suggestions as the project began. Special thanks, too, to Robert J. Marcusse, president and CEO, Kansas City Area Development Council, who was generous with his time and fine advice. Cynthia Taeuber, CMTaeuber & Associates, provided her usual outstanding recommendations of data sources.

The authors are also especially grateful to Bruce Katz and Jennifer Vey, and the Brookings Institution, not just for engaging us in the work, but for their continuing leadership, vision, and guidance. Riccardo Bodini of RW Ventures played a central role throughout the project, from its conception, through data assembly and analysis, to drafting major sections of this report: It could not have been accomplished without his extraordinary talents. Jack Kaplan and Mitchell Neirick provided outstanding research support.

Executive Summary

The Mid-America Regional Council (MARC) and the Civic Council of Greater Kansas City are examining strategies for economic success in the Kansas City metropolitan area.[1] As a foundation for this work, the Brookings Institution Metropolitan Policy Program was engaged to conduct a preliminary assessment of Kansas City's economic base and growth engines. Of particular interest was the position of Kansas City within the economy of what this paper defines as the Heartland.[2]

This preliminary assessment scans key aspects of Kansas City's economy to identify growth opportunities worth further examination. The research focused on four strategic areas affecting economic performance: industry composition, functional and occupational concentrations, knowledge and innovation, and regional connectivity.

Overall, Kansas City's economy is performing well. Between 1998 and 2001, Kansas City outpaced the country and the region in employment and wage growth. Its wages are 10 percent higher than the national average, and its per capita gross metropolitan product (GMP) is the second highest in the region.[3] This strong performance is due in part to high employment growth in some of the key industries that make up Kansas City's economic base, including telecommunications, wholesale trade, construction, and business support services.

Kansas City is also characterized by a highly-educated labor force deployed in knowledge- intensive occupations, an important component of economic success in today's knowledge-based economy. These occupations, including management, engineering, accounting, and marketing, reflect the presence of high-end business service functions that support local and regional headquarters.

Within the Heartland economy, Kansas City is a *regional metropolis* providing key economic functions and closely tied to other metropolitan areas in the region. It also plays important roles as a hub for transportation and logistics, and for cultural and other amenities. Kansas City is also a main center for networking and business services, as it houses a disproportionate number of small and mid-size company headquarters.

Given the characteristics of the local economy, Kansas City is well positioned to play an important role with respect to innovation as well. However, Kansas City is underperforming in this respect. There appears to be a shortage of venture capital and underinvestment in research and development, as well as a scarcity of institutional actors, such as universities or research centers, that could help stimulate the innovation process.

---

[1] "Kansas City" in this project refers to the Metropolitan Statistical Area (MSA) as defined in 1999 by the U.S. Office of Management and Budget.

[2] This initial analysis is technically focused on the relationships between the economy of Kansas City and other metropolitan areas in the Heartland. For the purposes of this project, the Heartland was defined as 12 MSAs including Des Moines, Kansas City, Lawrence, Lincoln, Little Rock, Oklahoma City, Omaha, Springfield MO, St. Louis, Topeka, Tulsa, and Wichita. See Section V for details.

[3] Only Des Moines, IA, had a higher per capita GMP than Kansas City ($34,300 versus $31,900).

In order to improve its performance in this and other respects, Kansas City should build on its current strengths in the context of both its regional connections and of the key drivers of economic growth nationwide. This means identifying and leveraging a nexus of knowledge-intensive occupations, functions, and industries that characterizes the local economic base and shapes Kansas City's role in the region. This report begins to define what this nexus might be, and proposes a possible plan to leverage Kansas City's unique assets.

One possible development strategy would build on this nexus of business services industries, functions, and occupations.[4] Developing on this core competency, Kansas City could strive to become a center of innovative business practices and services. To this end, the region might develop efforts to support practitioner networks, invest in research and development, or even create a new Business Services Institute that would bring together researchers and practitioners working on these issues. These innovative practices could be leveraged and applied through existing business networks and clusters of business services firms. In short, by working to strengthen support services, infrastructure, and knowledge functions that are already a key feature of the local economy, Kansas City is well positioned to become "the place to do business" in the Heartland.

[4] A much more comprehensive analysis is needed to elaborate a detailed economic development strategy. At this stage, the recommendations included in the report should be interpreted as illustrative examples and possible starting points for further work.

I. Introduction

This project approaches economic development by looking at three critical factors: the composition of the local economy; the key (and particularly changing or emerging) drivers of economic growth generally; and the geographic dimension of the economy (i.e. how economic activity in Kansas City fits within the larger Heartland economy). The development opportunity is to leverage the main strengths of Kansas City's local economy with an eye to both the key drivers of economic growth as well as the role the area plays in the broader regional economy.

The project focuses in particular on four strategic areas that get at this intersection of current strengths, key drivers, and regional connections, and as such have a significant effect on Kansas City's economic performance:

- Given that economic strength has traditionally been assessed in terms of industry concentrations, the paper focuses first on Kansas City's *industry composition*. Here the paper looks at what concentrations of related businesses and industries make up the local economic base, and how those compare to industries growing nationally. The objective is to assess both industrial specialization and diversification.

- In an economy that places a premium on knowledge assets, concentrations of economic functions (such as management and back office), as well as the concentration of knowledge and skills embedded in particular occupations, are becoming just as important as the concentration of specific industries. Thus the second strategic area the paper examines is Kansas City's particular *functional and occupational concentrations.*

- The third strategic area of focus is the presence and extent of knowledge resources in Kansas City, and in particular of *education and innovation resources.* These are two of the most important drivers of economic growth.

- The fourth strategic area is that of *regional connectivity*—the specific linkages that tie Kansas City's local economy to the other metropolitan areas in the Heartland region.[5] The focus on the region is due to the fact that, in the context of the global economy, regions are large enough to compete internationally but small enough to benefit from the concentrations of shared economic assets and activities.[6]

---

[5] Ideally, the boundaries of the economic region that is most relevant to Kansas City would be defined empirically by examining the relationships between Kansas City and other areas along different dimensions, and then by clustering together the areas that are more closely connected to each other than to the rest. However, for this first phase of work, the Heartland was defined a priori as a six-state region around Kansas City including the states of Kansas, Missouri, Nebraska, Iowa, Oklahoma, and Arkansas. The analysis then focused on the 10 largest metropolitan areas in this region, with the addition of Topeka due to its geographic proximity to Kansas City.

[6] See discussion of agglomeration economies in Section II, below.

This is far from an exhaustive list of the factors that can influence the economic performance of a metropolitan area. Other dimensions such as governance, infrastructure, sprawling land use patterns, and racial disparities can also significantly impact economic growth.[7] The areas examined here simply offer a fundamental and especially promising starting point for an economic assessment.

Moreover, these factors should not be seen as separate "silos," or items on a checklist. Rather, they are closely interconnected, and the most effective interventions will understand and build upon their connections. Ultimately, economic competitiveness derives from the synergies that arise at the intersection of these areas: A metropolitan area will more likely succeed when its core functional and industry concentrations are characterized by high levels of knowledge and innovation, and expand upon the role that the local economy plays within its region.

The report will discuss each of these strategic areas, first briefly exploring their importance, then providing findings from this first stage analysis. It then concludes by tying together these findings to offer an illustrative vision of a development strategy for Kansas City.

Key Findings:

- Kansas City's employment growth is led by business support services, wholesale trade, telecommunications, and construction services. Despite recent employment losses in some of these industries, they remain the region's leading employers.
- Fourteen industries have higher than normal concentrations of employment, suggesting that a significant number of industries export their goods and services outside of the Kansas City region.
- Between 1998 and 2001, Kansas City experienced employment growth in 24 industries, 15 of which grew at a faster rate than they did in the United States as a whole.
- The fast growth industries include both "new economy" and "old economy" industries.
- Manufacturing, a large part of Kansas City's economy, continued to lose jobs, though some of its industries and sub-industries were stable or even grew.

II. Industry Concentrations

One of the main factors affecting the performance of urban economies—indeed one of the main reasons for the very existence of cities—is the presence of "agglomeration economies." Agglomeration economies refer to the synergies and increased productivity that arise from the concentration of economic activity in a particular place. These

[7] As documented elsewhere, land use patterns and racial disparities are issues of particular concern in the Kansas City region. These issues are not discussed in this analysis, however.

benefits result from reduced transportation costs, shared inputs, economies of scale, and knowledge spillovers that generate savings and stimulate innovation.

Concentration of businesses can particularly benefit from such agglomerations. The benefits arise from sharing common technologies, distribution channels, and labor pools, and from developing buyer-supplier relationships or knowledge networks. Often referred to as business clusters, these concentrations can improve the productivity of firms, and become important determinants of economic competitiveness.

While "clustering" and industrial specialization can be economic virtues, from a regional vantage point it is also important to maintain a diversified industrial base. Industrial diversification can protect a region from the vicissitudes of individual industries. If there is little diversification, economic downturn in the dominant industry can drastically affect the entire region. As importantly, many economists point to the cross-fertilization and other benefits of agglomerating diverse economic activities.[8] Consequently, economic strategies should seek to identify and strengthen industrial specializations while also fostering economic diversification.

A. Leading Industries

We use three measures to identify Kansas City's key industry concentrations.[9] They include: (a) industry's share of Kansas City employment; (b) the net number of jobs the industry added between 1998 and 2001;[10] and (c) the industry's location quotient.[11] The higher the location quotient, the more likely it is that the industry is exporting its goods and services beyond the region, hence creating "export" revenues that ultimately sustain a regional economy.

---

[8] For a brief review of this literature, see Robert Weissbourd and Christopher Berry, "The Changing Dynamics of Urban America" (CEOs for Cities, 2004), pp 37-40, available at www.ceosforcities.org.

[9] This report focuses on industry concentrations and does not set out to define industry clusters. It was not necessary to address this methodologically contentious issue for a preliminary assessment. There have been various attempts to identify industry clusters—a concentration of businesses and industries that have buyer-supplier relationships or compete and cooperate to reach wider markets—but no approach to date is widely accepted. Appendix B includes a list of industries that comprise each industry category. For the most part they follow classifications used by the NAICS system. In a few instances terms were changed or minor shifts were made to make the industry categories sound and appear more intuitive.

[10] 2001 is the latest year for which County Business Pattern data is available. While there is business base data prior to 1998, the change in the industrial classification system from SIC to NAICS does not allow for clear time series analyses on some key industries. Hence, the researchers decided to use 1998 as the initial year for time series analyses. Consistent NAICS data is available for 1998 and 2001.

[11] Location quotient is a measure of specialization, and is given by the local share of employment in an industry relative to the share of employment in that industry nationwide. A high location quotient is a strong indication that the regional economy is producing goods beyond its own consumption and that it is exporting to other regions or nations. For instance, wholesale trade is 7.8 percent of the total Kansas City employment. Wholesale trade is 5.3 percent of the total national employment. Hence, the share of wholesale industry's employment in Kansas City is 1.5 times that of the nation. If the share was the same as the country's share, the number would be 1 and if less than the country's share the number would be less than 1. There could be other explanations for the high employment concentrations. For instance, the industry may not have kept up with productivity and efficiency gains that the rest of the country has experienced. Fully understanding the dynamics of these industries would require further analysis.

Figure 1 summarizes these three measures for the 22 industries that have employment greater than 10,000. While there are more industries in Kansas City, the industries covered in the graph constitute 90 percent of the metropolitan area's job base. We have also benchmarked the growth of each industry in Kansas City against its national growth trends. The results of this analysis are summarized in Figure 2.

Nine industries have been leading the Kansas City economy. For ease of analysis, below we have "lumped" together these industries into four broader categories: business services; telecommunications; sales, transportation and logistics; and construction and real estate.

Business Services
- Business support services
- Management, technical, and scientific services
- Finance and insurance
- Professional Services

Telecommunications
- Telecommunications

Sales, Transportation, and Logistics
- Wholesale trade
- Transportation and warehousing

Construction and Real Estate
- Construction services
- Real estate

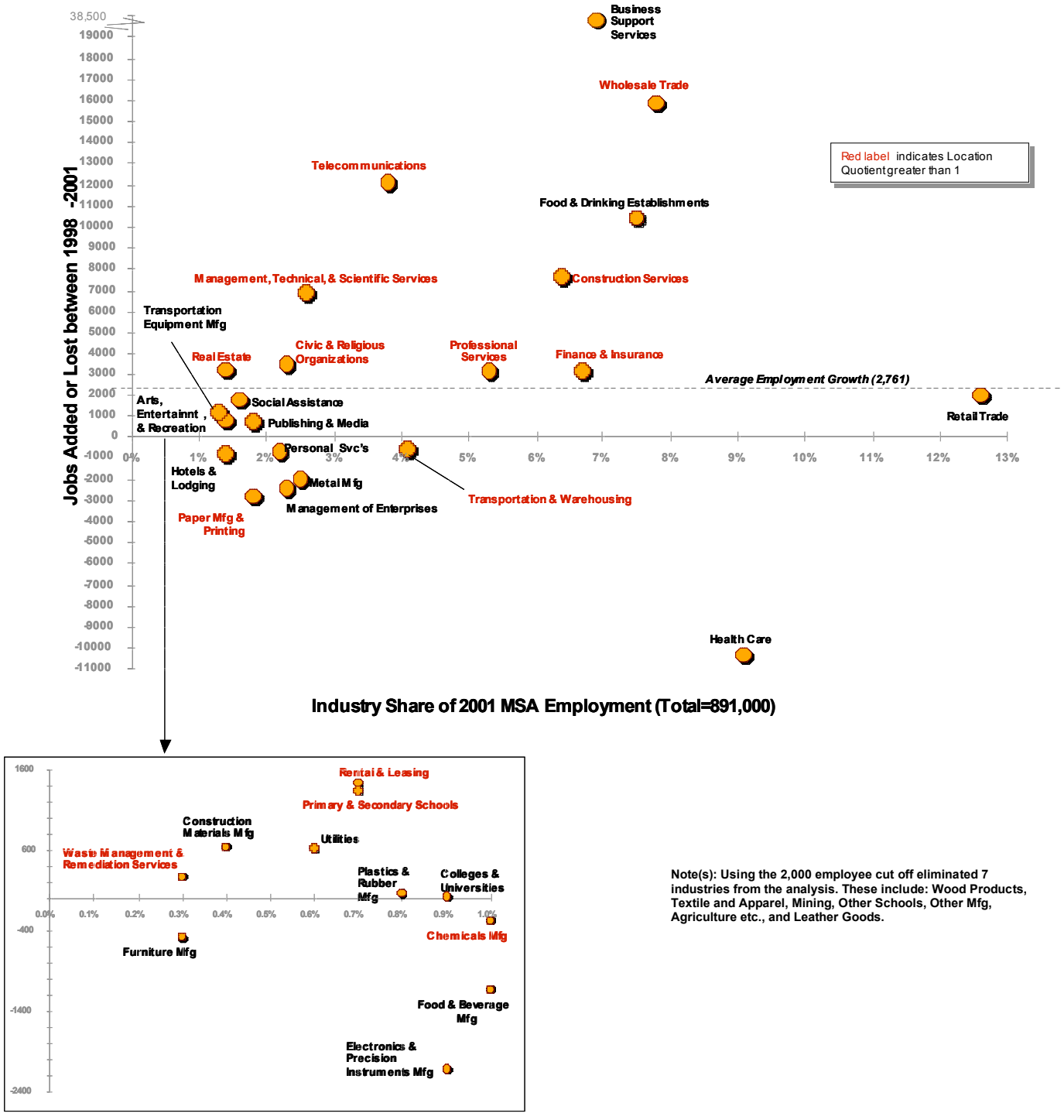
These industries are large employers, in most cases have added sizable employment in a short period of time and, with one exception, have a higher than normal concentration in Kansas City. The exception is business support services.

Importantly, many of these leading industries outpaced their U.S. employment growth (Figure 2). While Kansas City as a whole outpaced the country in employment growth (2.6 percent per year versus 2.1 for the nation), in the case of Kansas City's leading industries the gains were more impressive:

- Business support services and wholesale trade grew almost 6 times faster than they did in the country as a whole;
- Real estate grew 3 times faster;
- Telecommunications grew 2 times faster.

Should these trends continue, Kansas City could develop further specialization in these industries.

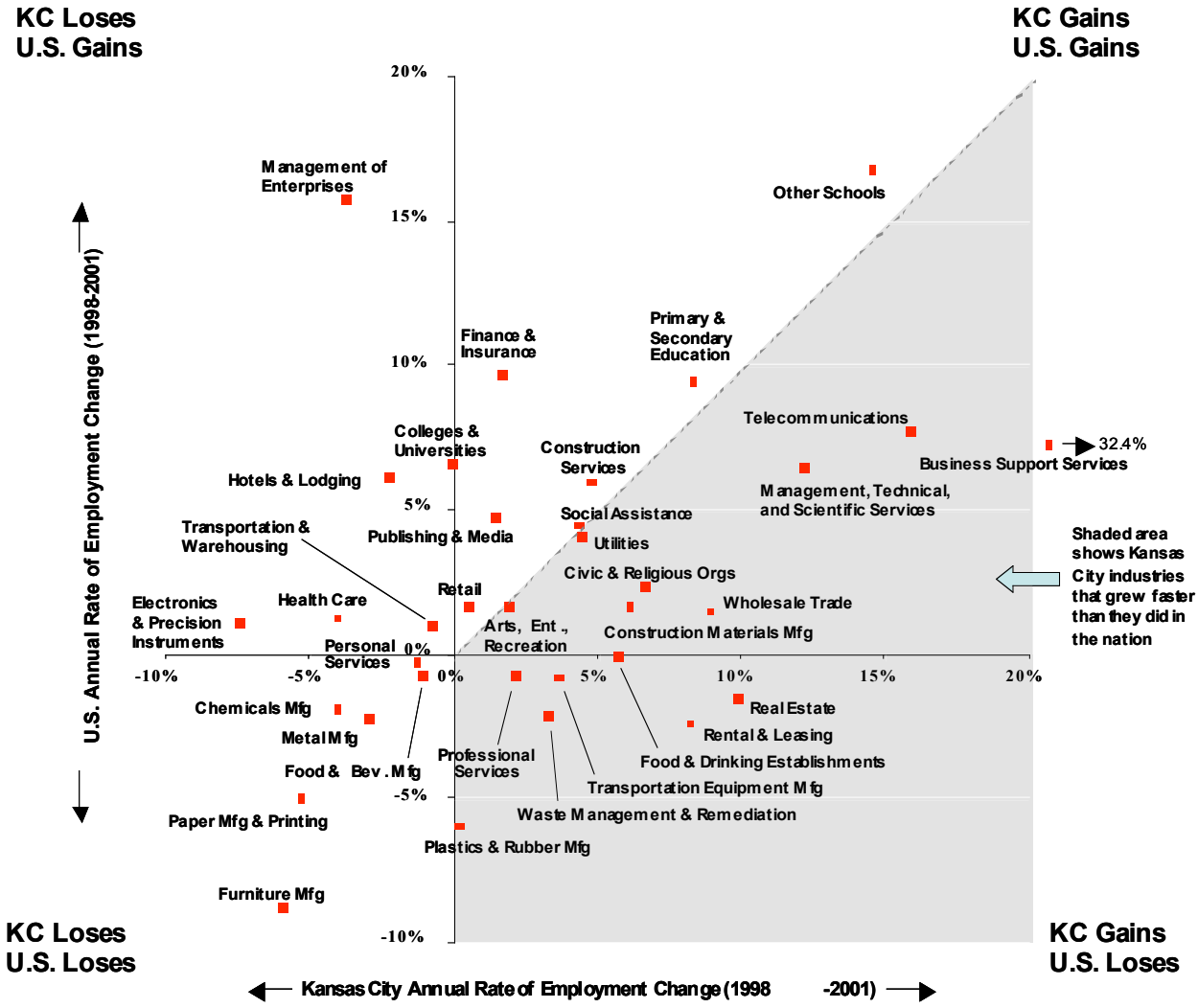
Figure 1. Kansas City Industries by Size, Growth, and Location Quotient (1998–2001)[12]



Note(s): Using the 2,000 employee cut off eliminated 7 industries from the analysis. These include: Wood Products, Textile and Apparel, Mining, Other Schools, Other Mfg, Agriculture etc., and Leather Goods.

[12] The data sources for all the figures are reported in Appendix E.

Figure 2. Kansas City vs. National Employment Growth Rate (1998–2001)



Below are some detailed accounts of Kansas City's leading industries.

Business Services

- Business support services employs 68,000 workers.[13] Almost 40 percent of the industry's jobs are in employment services (25,000), such as temporary help and placement agencies. Another 20 percent is in building maintenance including janitorial and landscaping services. While the concentration of business support service jobs in Kansas City is the same as its concentration in the U.S. economy, the industry added a phenomenal number of 38,500 jobs from 1998 to 2001, a 32.4

[13] Business Support Services is only one component of the much broader business services specialization discussed later in the report. We use Business Services to also include professional services such as accounting and legal services, finance and insurance, management consulting, advertising, and so forth.

percent increase per year. This is more than six times the growth rate of the industry across the country.

- Management, technical, and scientific services employs 23,000, more than half (13,000) in computer systems design and related services. Another 7,000 work in management consulting services, with the remainder working mostly in scientific research and development.[14] The industry has a high location quotient of 1.2.

- Finance and insurance and professional services are also industries with location quotients greater than 1. Together they employ 107,000 (60,000 and 47,000 respectively). They both showed employment growth, though slightly lagging the national growth rate. Combined they created 6,000 jobs in the four year period.

Telecommunications

- Telecommunications employs close to 34,000 workers with two-thirds in wired telecommunications. This is up by 12,000 from 1998. From 1998 to 2001, the industry's growth rate of 15.9 percent was twice that of the country as a whole. Telecommunications in Kansas City has a location quotient of 3.5, the highest among all Kansas City industries.[15]

Sales, Transportation, and Logistics

- Wholesale trade employs 70,000 workers. The largest employer in the industry is paper and paper products (19,000 employees), especially stationery and office supplies. This is followed by machinery, equipment, and supplies (8,700 employees), comprised mostly of industrial machinery. Wholesale trade added a net of 16,000 jobs in the four-year period. It has a location quotient of 1.5, making it the third most concentrated industry. Its employment growth rate was almost six times that of the country as a whole, strongly suggesting Kansas City's increasing concentration in this industry.

- Transportation and warehousing is also a relatively large employer in Kansas City (37,000). At first glance, local trends in this industry seem to have countered those nationally: The industry lost employment in Kansas City whereas it gained employment in the U.S. (loss of 0.6 percent per year in Kansas City while growing at 3 percent per year nationwide). Decline in transportation and warehousing, however, occurred mostly because of losses in messenger and courier services. Support activities for warehousing, another sub-industry of transportation and warehousing, actually grew by 2,300 jobs. This growth concurs with the growth in

[14] This does not include workers in academic institutions, who are captured in the statistics on colleges and universities reported below.

[15] Preliminary data from 2004 Current Employment Statistics of the Bureau of Labor Statistics suggests that the telecommunications industry has lost half of these employment gains over the past three years, about 5,500 jobs. Employment in the sector is still high, however, and the location quotient remained virtually unchanged from 2001 to 2004. While more current, with a few exceptions this data source is of limited value when attempting to understand detailed industry trends at the MSA level. Telecommunications is among the exceptions.

wholesale trade, one of the leading industries in Kansas City. Moreover, the industry has a high location quotient of 1.3.

Construction and Real Estate

- Construction services employ 57,000 people. It consists of special trade contractors (35,000), builders and general contractors (14,000), and heavy construction (9,000). Construction added 7,600 jobs in the four-year period. It has slightly higher than normal concentration of jobs with a location quotient of 1.1.

- Real Estate employs 13,000 workers. Kansas City has a higher than normal concentration of this industry. Its annual growth of 9.9 percent outpaced the national growth by almost 7 percentage points over the four years.

B. Other Significant Industries

Retailing and health care are the two largest employers in Kansas City. Retailing employs 112,000 workers while health care employs 82,000 workers.

Both industries, however, seem to be serving primarily the local market. Retailing has a location quotient of 1. Health care, on the other hand, has lower than normal representation. The location quotient for the health care industry is 0.8 when compared to the national economy, and 0.9 when compared to the economy of the Heartland.

In terms of growth, retailing showed hardly any employment gains, but was consistent with the industry's national trend. On the other hand, health care in Kansas City bled jobs drastically, even as the sector gained employment nationally at an annual rate of 1.3 percent.

Food and drinking establishments employ 67,000 people. From 1998 to 2001, the industry in Kansas City experienced a high growth rate of 5.8 percent per year. In the same period, the national growth rate was 3 percent per year. Food and drinking establishments have a location quotient of 1 in Kansas City, indicating an employment concentration on par with the country. Employment in food serving establishments outnumbers drinking establishments 24 to 1.

Civic and religious organizations employ 21,000 people. Seventy-five percent of the Kansas City employment in this industry is in religious organizations. Grant-making organizations and social organizations each constitute 10 percent of the employment. The remaining 5 percent is in social advocacy groups. Kansas City has a higher than normal concentration in this industry, especially in grant-making organizations (location quotient of 1.9) and religious organizations (1.3). From 1998 to 2001 the industry grew at a rate of 6 percent per year, twice the rate of the country as a whole.

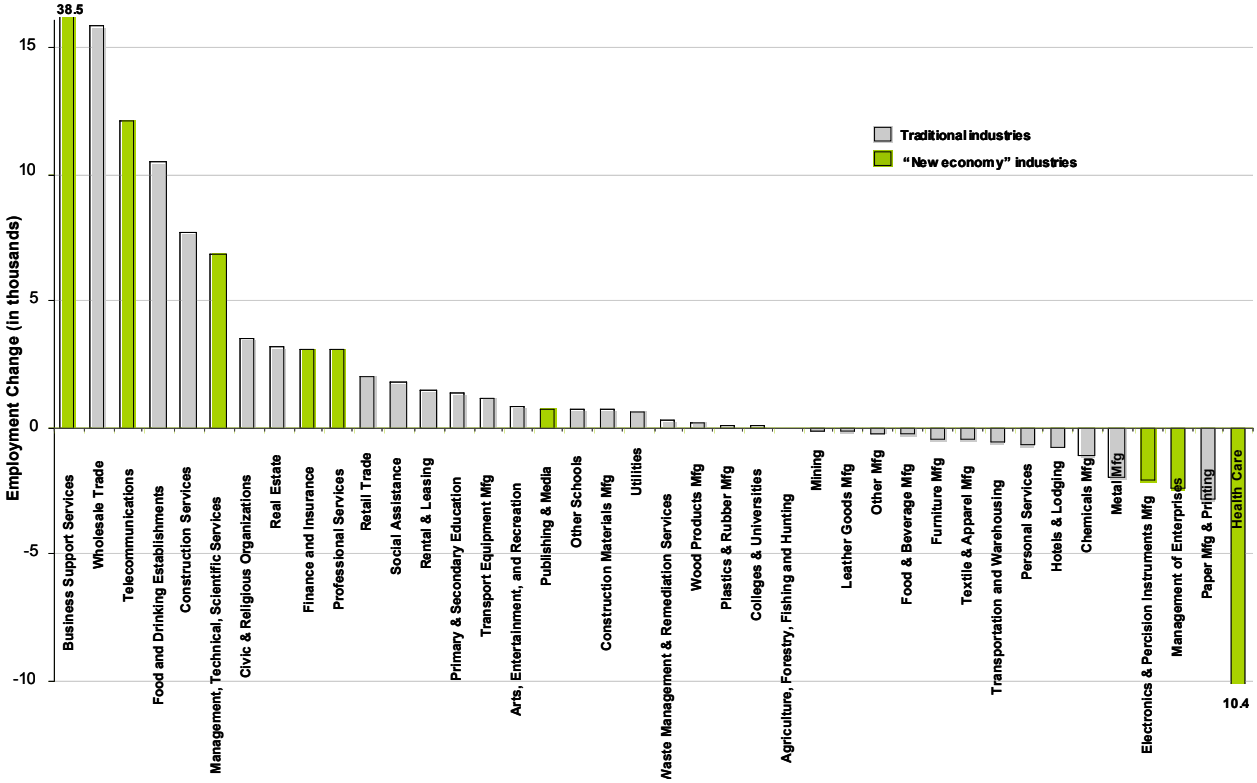
C. "New Economy" and "Old Economy" Jobs

Since the late-1990s the use of the term "new economy" has become commonplace, though any exact definition is elusive. What is clear is that knowledge or information intensive industries are thriving, and that information and knowledge inputs, embedded in technology and workforce, are increasingly important components of both the production process and the value of goods created across all industries. For these preliminary assessment purposes, we have loosely categorized industries as "new economy" based on the extent to which they use and produce information, ideas, designs, and similar intangible services that are fueled by brainpower and innovation. Telecommunications and management, technical, and scientific services, for instance, are categorized as new economy industries. Retail trade and metal manufacturing, on the other hand, are defined as "old" economy industries (Figure 3).

Industries categorized as "new economy" provide 40 percent of Kansas City jobs. Old economy industries comprise the remaining 60 percent. The country as a whole has a similar 40/60 breakdown between "new" and "old."

Both old and new economy industries contributed significantly to job creation and loss. "New economy" industries added 65,000 jobs and lost 15,000 jobs (a net gain of 50,000 jobs). "Old economy" industries added 51,000 jobs but lost 10,000 jobs (a net gain of 41,000 jobs).

Figure 3. Kansas City Employment Growth (1998–2001)



When looking at the growth *rate*, however, new economy industries in Kansas City grew at double the rate of old economy industries—5 percent per year for new economy versus 2.7 percent per year for old economy industries.

In the same period the country as a whole experienced 3.2 percent annual growth for new economy jobs and 1.3 percent per year for old economy jobs. Kansas City outpaced the country on both types of industries.

D. Manufacturing and Non-manufacturing Industries

Manufacturing has long been a key part of the Midwestern economy. The economic health of the region is often measured by how manufacturing fares. The industry analysis above suggests that the Kansas City economy is not particularly dependent on manufacturing. However, manufacturing is still significant: It employs 93,000 people, with 30 percent of this total in metal manufacturing, 18 percent in paper manufacturing and printing, and 12 percent in transport equipment manufacturing (Figure 4).

All types of manufacturing, with the exception of three sectors, shed jobs from 1998 to 2001. The exceptions were transportation equipment, plastics and rubber, and construction materials. In fact, manufacturing industries that lost jobs lost them faster than the country as a whole. For instance, Kansas City lost metal manufacturing jobs at a rate of 2.3 percent per year, while the country lost them at a rate of 1.8 percent per year.

Figure 4. Manufacturing vs. Non-manufacturing (1998–2001)

	Kansas City			U.S.
Industry Name	**2001 Employment**	**Net number of jobs gained/lost**	**1998-2001 Annual Employment Growth Rate**	**1998-2001 Annual Employment Growth Rate**
Metal Mfg	22,194	(2,006)	-2.8%	-1.8%
Paper Mfg & Printing	16,458	(2,831)	-5.2%	-2.3%
Transport Equipment Mfg	11,157	1,157	3.7%	-2.8%
Chemicals Mfg	8,907	(1,132)	-3.9%	-1.3%
Food & Beverage Mfg	8,543	(272)	-1.0%	0.1%
Electronics & Precision Instruments Mfg	8,375	(2,129)	-7.3%	-1.4%
Plastics & Rubber Mfg	6,701	58	0.3%	-0.9%
Construction Materials Mfg	3,645	644	6.7%	1.0%
Furniture Mfg	2,499	(488)	-5.8%	0.8%
Other Mfg	4,256	(715)	-5.0%	-2.5%
All Manufacturing	**92,734**	**(7,714)**	**-2.6%**	**-1.4%**
All Non-manufacturing	**817,576**	**98,636**	**4.4%**	**2.8%**

But data at such an aggregate level can be misleading. Within metal manufacturing, for example, Kansas City lost jobs in fabricated metal products, and gained jobs in machinery and primary metals manufacturing.

Similarly, paper manufacturing and printing lost jobs at a rate of 5 percent a year, faster than the country's loss of 2 percent a year. Most of the loss, however, occurred in printing and related services. Paper manufacturing has maintained the same level, employing approximately 6,000 workers. In a ranking of all industries—both manufacturing and non-manufacturing—paper manufacturing and printing has a location quotient of 1.6, a distant second to telecommunications' 3.5.

III. Functional and Occupational Concentrations

Key Findings:

- Kansas City's economy is characterized by a concentration of knowledge-intensive occupations, such as management, engineering, and marketing.
- These occupational concentrations reflect the presence of a set of high-end business services functions, possibly supporting local and regional business headquarters.
- Kansas City is also an important logistics center, as indicated by its high concentration of transportation occupations.

While clusters and industry concentrations have long been the focus of academic research and policy practice, over the past few years increasing attention has been paid to the geographic concentration of specific functions and occupations. Evidence has been mounting that cities now tend to specialize in particular functions, such as management, production, or back office, rather than (or in addition to) specific industries such as chemical manufacturing or aerospace.[16]

This shift is due to two concurrent trends. First, the benefits of agglomeration economies in generating production efficiency and innovation may now arise not only from the proximity of firms that operate in the same industry, but also from the proximity of facilities that perform the same functions for firms in different industries. In today's knowledge-based economy, the concentration of particular skills and competencies across industries is just as important as the concentration of firms within the same industry. Second, the innovations in information technology reduce the cost of sharing, managing, and communicating information across disparate geographies, facilitating remote operations and allowing firms to separate functions that previously had to be located in the same place.

As a result of the combination of these two factors (increased benefits of concentrating functions and decreased costs of locating different parts or functions of the same business

[16] See Gilles Duranton and Diego Puga, "From Sectoral to Functional Urban Specialization," NBER Working Paper 9112 (2002), available at www.nber.org/papers/w9112, and James C. Davis and J. Vernon Henderson, "The Agglomeration of Headquarters" (Washington: The Center for Economic Studies, 2004), available at http://148.129.75.160/ces.php/abstract?paper=101688.

in different places), firms previously organized as a single unit may now tend to become multi-unit organizations. This separation usually happens along functional lines because units performing different functions tend to locate in places where those functions are best supported. Thus, cities more often have concentrations of headquarters, for example, or production facilities, or back-office facilities. The result is a shift in the employment patterns in cities, where specialization by industry sector can be replaced by specialization in economic functions, including particular sets of occupations and areas of knowledge, expertise, or skills.

Due to the increases in productivity that the agglomeration of particular functions and occupations can generate, these concentrations have the potential to become important engines of local economic growth, and deserve detailed analysis. The presence of functional concentrations is revealed by the analysis of how the workforce is distributed across occupations: It is reasonable to assume, for example, that a metropolitan area with a high concentration of management-related occupations will have a concentration of management functions as well. Similarly, places that have a concentration of factory workers are likely to be specializing in production functions.

In addition to particular functional concentrations, an analysis of occupations will also reveal concentrations in particular areas of knowledge and expertise.

Several functional specializations appear to be present in Kansas City:

- Business management and administration. Kansas City had a high concentration of managers in the late 1990s. Although the concentration of this occupation overall has been declining, some of its key component occupations—such as chief executives, operations managers, and sales and marketing managers—remain high.

- Financial, insurance, and legal support. Kansas City has high location quotients for financial and insurance workers. The location quotients for claims investigators and insurance appraisers are 1.9 and 4.4, respectively. Accountants, auditors, and financial examiners also have higher than normal concentrations, as do credit checking and collections. Even though Kansas City has lost a large number of legal workers, it continues to have a high concentration.

- Sales, marketing, and customer service support. Not only are sales and marketing management functions concentrated in Kansas City, but there are also high concentrations of their support services. The concentration of sales agents of manufactured products, including technical and scientific products, is particularly high. Telemarketing also has a higher than normal concentration.

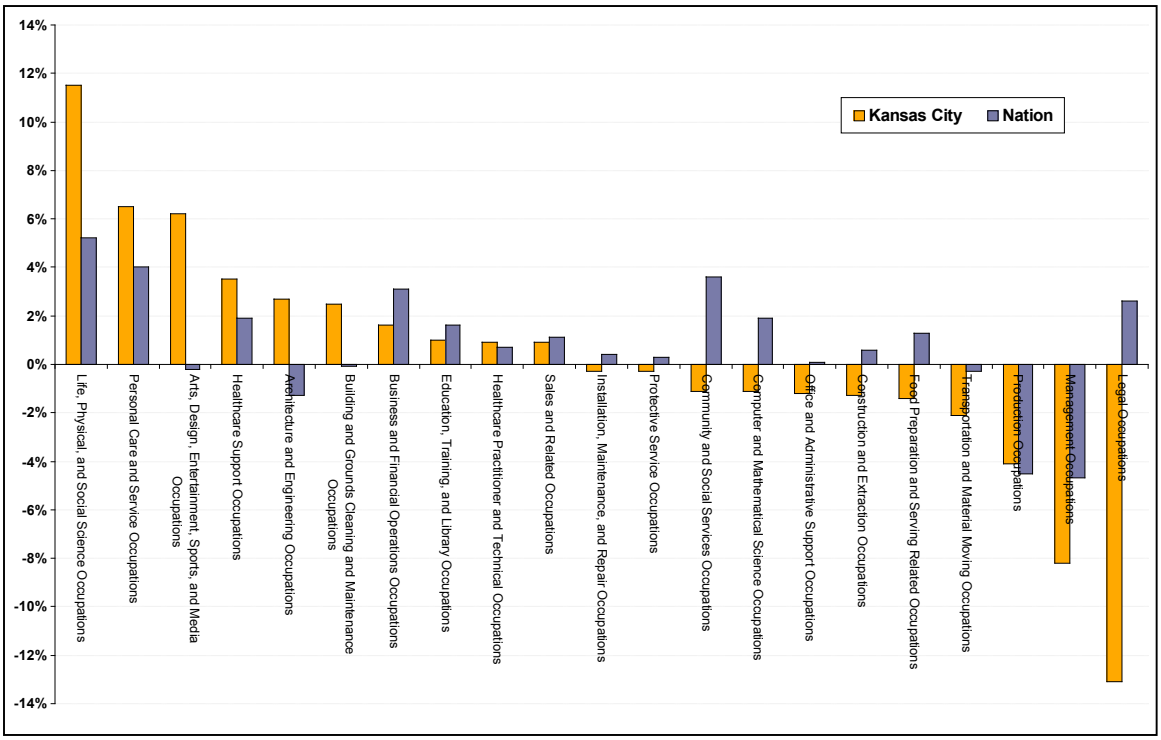
  Marketing is also large and highly concentrated, with a big presence of market research analysts, public relations professionals, and advertising sales agents. For instance, there are close to 1,700 market research analysts (a location quotient of 1.6). Even the art and entertainment occupations primarily support marketing. They include graphic designers and related occupations. Printing occupations are also highly concentrated in Kansas City, with 2,300 printing press operators (location quotient of 1.6).

Customer service support is also particularly strong in Kansas City. The region has 19,000 customer service representatives, a location quotient of 1.3.

- Computers and engineering. More than 28,000 people work in computer-related occupations. They include computer system analysts, programmers, and support service providers. There are close to 19,000 engineers in fields like civil, mechanical, and, to a lesser degree, electrical engineering. There is also a large base of engineering support technicians. The concentration of computer-related occupations has been decreasing while the concentration of engineering has been on the rise.

- Transportation and logistics. Kansas City is a transportation and logistics hub. Great volumes and value of goods pass through the region. There are close to 18,000 transport and industrial truck drivers. There are 2,500 bus, truck, and diesel engine specialists (location quotient of 1.4). Air cargo handling is also highly concentrated.

Figure 5. Employment Growth by Occupation (1999–2003)



The presence of occupational concentrations in management, financial and legal services, and marketing and sales, indicates that the local economy is characterized by a set of managerial and high-end business service functions. This is confirmed by the analysis presented in section V below, which highlights the role of Kansas City as a significant center for headquarters and business networks in the region.

There are, however, two striking losses related to these occupational concentrations that future studies should examine. Legal occupations lost jobs at a rate of 13 percent per

year from 1999 to 2003 (compared to 3 percent growth nationally). This amounts to a loss of more than 6,000, most likely high-paying, jobs. Management occupations also lost employment drastically (and at higher rates than national losses): Kansas City lost 20,000 management jobs, at a rate of 8 percent per year. This is by far the largest loss among all occupational categories, outnumbering even the loss of production occupations associated with manufacturing. While legal and management remain important concentrations in absolute numbers, the nature of and reasons for the job loss bear closer examination.

IV. Knowledge and Innovation

Key Findings:

- Kansas City has a highly educated labor force, with a higher than average percentage of adults with a college degree and a lower than average percentage of adults without a high school diploma.
- Kansas City has a high concentration of expertise in some of the occupations associated with high rates of innovation, but is normal or lags in other critical occupations.
- Kansas City has no top-level research university. While Stowers Institute is beginning to attract R&D dollars, the institutional gap is wide. Generally, private industry remains the largest funder of R&D in Kansas City, and should thus be a main focus of policy interventions aimed at enhancing innovation.
- Kansas City trails other areas in the production of new patents, possibly due in part to little investment in R&D, scarce availability of venture capital, and inadequate research infrastructure.

Economists for some time now have considered innovation the key driver of sustained, long-term economic growth. They've argued that the quantity and the quality of the goods the economy produces can only be improved and increased through innovation. Consequently, places that are successful "producers" of ideas and innovation have a leg up in expanding their economic base and generating wealth for their residents.[17]

However, the ability to produce innovative ideas per se is not enough to expand economic activity and generate growth. Ideas have to be turned into products and viable enterprises through a commercialization process that requires entrepreneurship, access to funds, and a vital business climate.[18]

[17] Paul Romer, "Two Strategies for Economic Development: Using Ideas and Producing Ideas," Proc. of the World Bank Annual Conference on Development Economics (1992).

[18] See, e.g., Joseph Cortright and Heike Mayer, "Signs of Life: The Growth of Biotechnology Centers in the U.S." (Washington: Brookings Institution, 2001).

The advent of the knowledge economy has placed an additional premium on innovation and its commercialization.[19] Advances in information technology have increased the pace at which innovation is taking place, and creative and innovative networks of people and firms play a more important role. Consequently, the role of knowledge and education has also become more prominent. Investments in information and communication technology are complementary with investment in human resources and skills.[20] As knowledge-intensive occupations play a more dominant role in the production process, the relevant competencies of the workforce change, and skilled labor inputs tend to become more crucial. Therefore, cities that have a more highly educated population generally also have a more productive and innovative workforce, can more easily leverage investment, and are better positioned to compete and thrive in the new economic environment.[21]

To assess Kansas City's capacity to innovate and commercialize innovations, our study examined four interrelated factors:[22]

- Workforce skills necessary for innovation
- Institutional infrastructure for innovation
- Research and development activity
- Venture capital funding

The findings reported in the following sections suggest that in high-level measures of innovation, Kansas City lags the nation and the Heartland region. Industry-specific data, however, paint a brighter picture. Further, there is evidence that some improvements may be expected. However, Kansas City seems to have serious shortcomings in a critical component of an innovative economy: research and development activities.

A. Workforce Skills and Patents

For workforce skills we considered two factors: (a) educational attainment by Kansas City residents; and (b) prevalence of occupations associated with innovation.

Based on 2000 Census figures, Kansas City has a high percentage of people with a BA or higher degree and a low percentage of people without high school diploma. Twenty-nine percent of the Kansas City population has a bachelor's degree or higher compared to 23 percent of the U.S. (Figure 6). Kansas City ranks 30th in college education attainment out of over 250 metropolitan areas in the country.

---

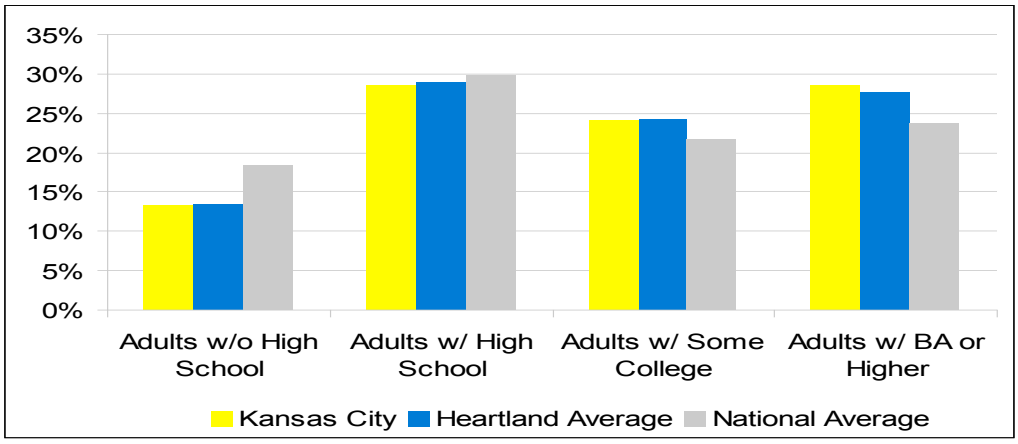
[19] Defined by the fact that knowledge has become an increasingly important factor of production, and that wealth creation increasingly depends on the combination of knowledge and technology.

[20] See, e.g., Weissbourd and Berry, "The Changing Dynamics of Urban America" and John Houghton and Peter Sheehan, "A Primer on the Knowledge Economy," (Center for Strategic Economic Studies, Victoria University, 2000).

[21] Confirming the importance of education, Weissbourd and Berry ("The Changing Dynamics of Urban America") found that the percentage of population with a BA is by far the strongest driver of income and wage growth in cities and metropolitan areas.

[22] While the importance of innovation has long been recognized, the data and capacity to measure aspects of innovation remains underdeveloped. The factors selected here are a reasonable starting point for a preliminary assessment, considering what's available, but leave much room for more in depth investigation.

Figure 6. Educational Attainment of Population 25 and older (2000)



Kansas City's college-educated population is also growing fast. In a ten-year period, it grew over 5 percentage points, from 23.4 percent in 1990 to 28.5 percent in 2000. This is faster than the growth in both the Heartland region (4.2 percentage points) and the country as a whole (only 3.7 percentage points).

Educational attainment is a useful but too broad a measure when attempting to gauge the innovative capacity of a region. A more specific indicator is the prevalence of certain skills, including quantitative, computational, management, and research. Occupational data was used to measure the presence of these skills in the Kansas City workforce. Our assumption is that individual occupations require well-defined skills and that, in the aggregate, people working in a given occupation have those requisite skills.

Kansas City has a high concentration of expertise in some of the occupations associated with high rates of innovation but is normal or lags in others. Among the most highly represented are legal occupations, computer and mathematical science occupations, and business and financial occupations (Figure 7). Kansas City also has slightly greater than normal representation of architecture and engineering, arts and entertainment, and management occupations. Among the least represented are scientists and educators.

Figure 7. Concentration of Knowledge Occupations (2003)

	Concentration relative to Nation
Legal Occupations	1.5
Computer and Mathematical Science Occupations	1.4
Business and Financial Operations Occupations	1.2
Architecture and Engineering Occupations	1.1
Arts, Design, Entertainment, Sports, and Media Occupations	1.1
Management Occupations	1.1
Healthcare Practitioner and Technical Occupations	1.0
Education, Training, and Library Occupations	0.8
Life, Physical, and Social Science Occupations	0.7

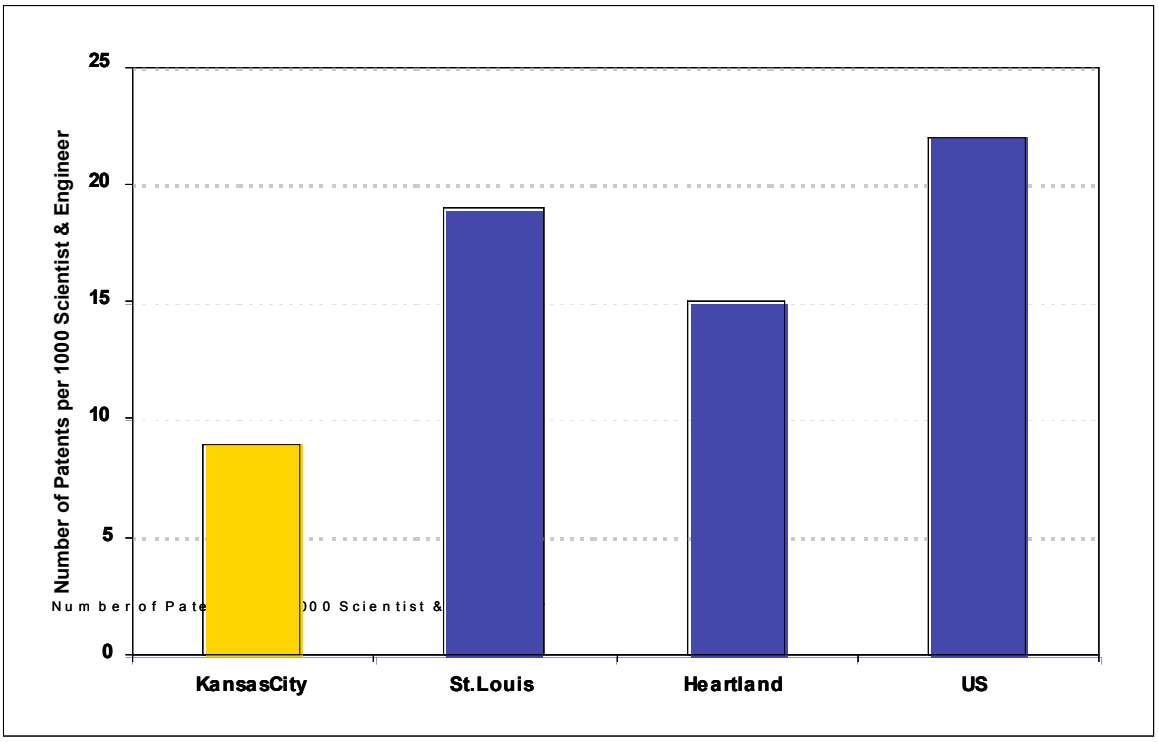
There is some evidence to suggest improvements are likely. For instance, science-related occupations grew faster in Kansas City than in both the country as a whole and the Heartland region. Kansas City also saw faster growth in design and engineering occupations. The number of information technology workers, on the other hand, decreased, as did workers in management and law.

The presence of these occupations can lead to economic growth in so far as they generate new ideas and innovations. One frequently used measure of innovation is the number of patents. While this is a crude measure, when used comparatively it can help in understanding the innovative vigor of a region, especially with respect to innovation that is geared toward commercialization.

The overview picture for patents in Kansas City is not very bright. Kansas City, on average, generates significantly fewer patents than St. Louis, for instance. In a five-year period ending in 2003, Kansas City generated 331 patents per year. St. Louis, on the other hand, generated 795 patents per year, 2.4 times more than Kansas City (with an employment base that is only 1.4 times greater than Kansas City's).

The productivity of Kansas City's knowledge workers is even more troubling: For every 1000 scientists and engineers, Kansas City generated 9 patents per year. This contrasts with 19 patents for St. Louis, 15 for the Heartland region, and 22 for the nation (Figure 8).

Figure 8. Number of Patents per 1000 Scientists & Engineers (based on 1999–2003 annual averages of patents and workers)



The picture improves when patenting data is disaggregated by industry (Figure 9). Kansas City had higher than normal concentrations in 16 of the 30 industries reported.[23] While the high concentrations of patents are at times consistent with the Kansas City's industrial makeup, in some cases they don't easily map.[24] Patent concentrations not consistent with industrial activity include food and tobacco, agriculture, textiles and apparels, and pharmaceuticals. In some of these instances, such as food and agriculture, high concentrations may indicate that patents in Kansas City may be supporting industries in the Heartland region.

Patent concentrations consistent with industrial activity within Kansas City include:

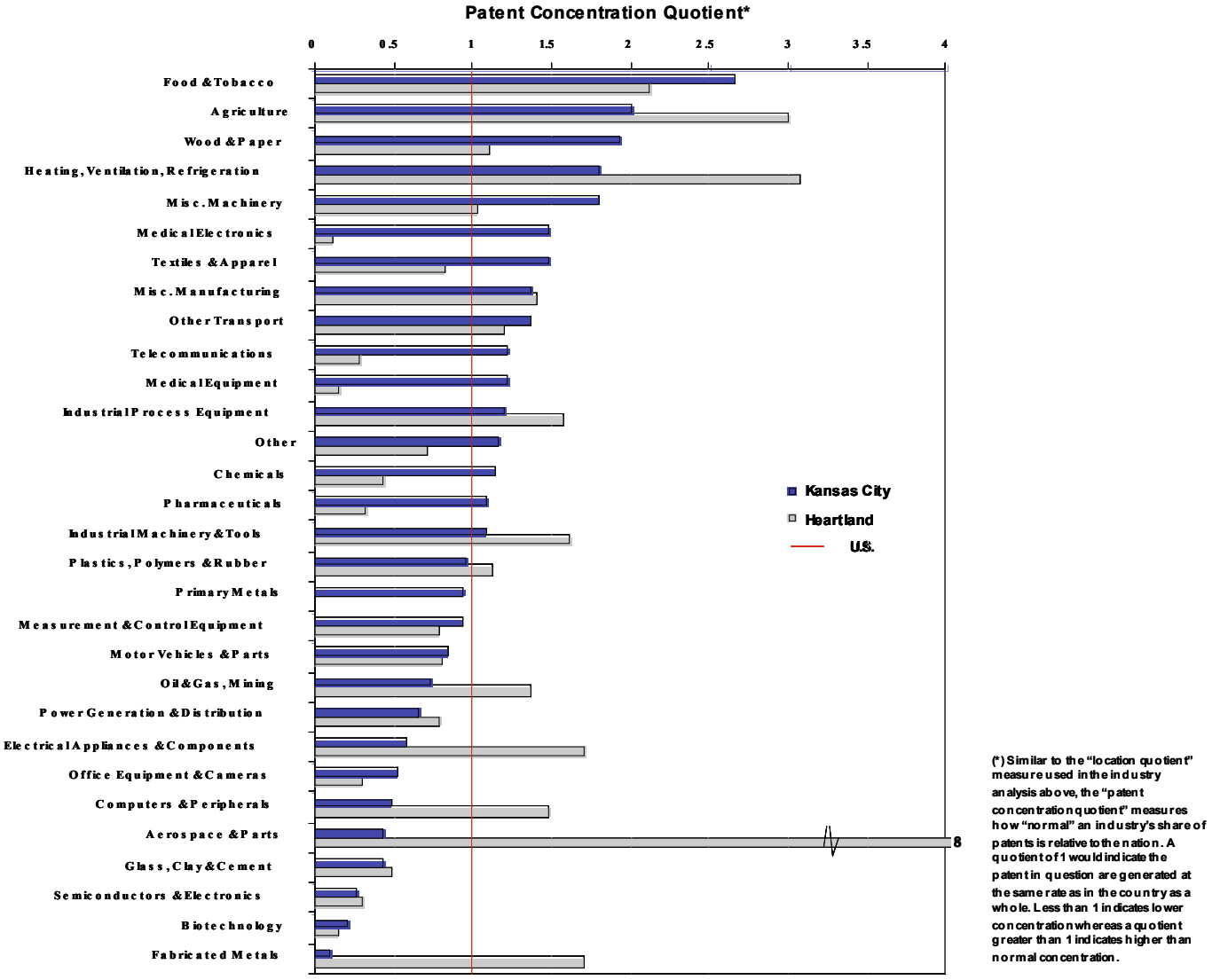
- Wood and paper patents, related to paper manufacturing,
- Heating/ventilation/refrigeration, miscellaneous machinery, and industrial process equipment patents, related to metal manufacturing
- Telecommunications patents, related to the telecommunications industry

[23] Note that the industry definitions used in the patenting data are different from the industry definitions used for the business base analysis. In addition, the reporting entities may be individuals who are not captured in the business base data, or companies and institutions that are captured differently.

[24] Patent concentrations are calculated using the same method as location quotient for employment. The only difference is that instead of the number of people employed in a given industry, the unit of analysis is number of patents in a given industry. Hence, in the case of Wood and Paper, the concentration of 2 indicates that the share of wood and paper patents in Kansas City was twice the share of those patents in the country. A concentration of 1 indicates that Kansas City has the same share. Less than 1 indicates that Kansas City has less than the country.

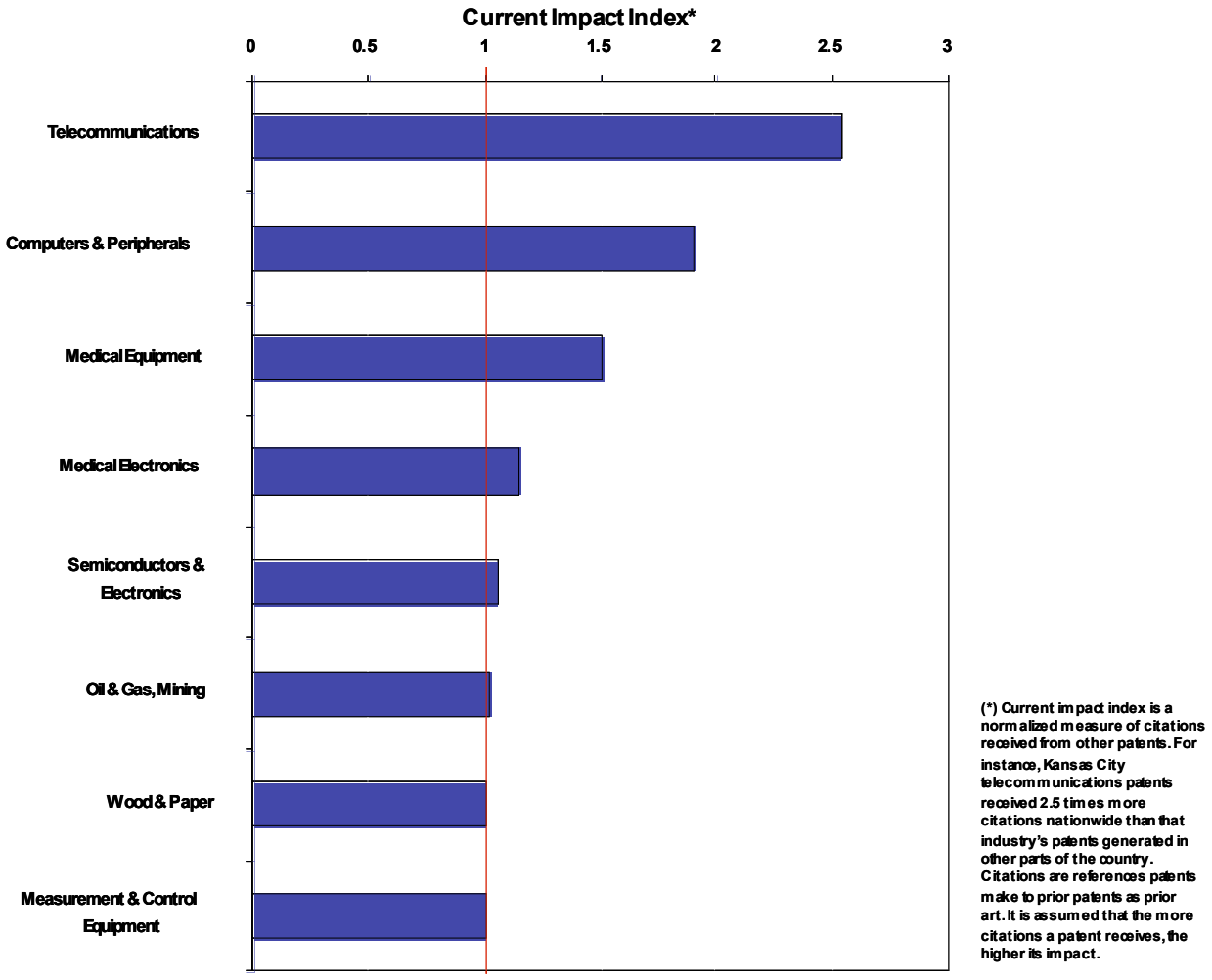
- Chemicals patents, related to the small but highly concentrated chemicals manufacturing industry
- Medical electronics and medical equipment patents which are related to the electronics and precision instruments manufacturing. This industry, however, is relatively small with a low location quotient.

Figure 9. Kansas City Concentration of Patents by Industry (average for five years ending in 2003)



Data on the impact of patents—defined as number of citations a patent receives in other patent applications—also shows positive trends. Kansas City had patents in eight industries that had higher than normal number of citations (Figure 10). The industry whose patents had the highest impact was telecommunications. This was followed by computers and peripherals and medical equipment and electronics.

Figure 10. Impact of Patents by Industry (1999–2003)



In summary, the Kansas City region has a growing workforce of scientists and engineers, which play a critical role in generating innovation. While, as a whole, these scientists and engineers are not as productive in patents as elsewhere in the Heartland or the country on average, once the data is broken down by industry, there seems to be intensive and high impact activity in telecommunications, computers and peripherals, medical equipment and instruments, and electronics.

B. Institutional Infrastructure

Many institutions—industry labs, federal labs, professional and trade organizations—play critical roles in generating and disseminating innovations. Among these, colleges and universities are particularly important.

Kansas City, however, has relatively few colleges and universities. The industry constitutes less than 1 percent (0.9 percent) of Kansas City employment. St. Louis, for

instance, has 1.3 percent of its employment in colleges and universities. The Heartland region has 1.2 percent and nationally the industry is 1.4 percent of the economy.

In terms of growth, colleges and universities in Kansas City also lagged the country and the Heartland. The industry grew at a rate of 3 percent per year both throughout the U.S. and in the Heartland. In Kansas City, virtually no growth took place.

The Kansas City metropolitan area has more than 60 colleges, universities, and professional training institutes.[25] A big portion includes professional and trade-specific schools (such as nursing, technology training, trucking, and the like). The remainder mostly consists of vast community college networks—including Metropolitan Community Colleges and Johnson County Community College—and small liberal arts or masters-granting colleges—such as William Jewel College.

According to the Carnegie Classification of Institutions of Higher Education, only one institution in Kansas City—namely, the University of Missouri, Kansas City (UMKC)—is categorized as a doctoral/research university (Figure 11). UMKC, however, ranks as a second-tier doctoral/research university, and Kansas City has no tier-one institution. In contrast, St. Louis has two, Boston has seven, and Los Angeles has six tier-one institutions.

While the Carnegie Classification avoids ranking institutions, it does classify doctoral-research universities into two types, depending on the number of doctoral degrees awarded annually.[26] To provoke discussion, the authors of this report extrapolated a two-tier doctoral university system that is in line with Carnegie's classification. Tier-one universities are the ones Carnegie calls "extensive" with 50 or more doctoral degrees awarded whereas tier-two or "intensive" institutions are ones with fewer degrees awarded.

[25] This is a rough estimate compiled by the authors from several sources including the Missouri Department of Higher Education, 2003 Kansas City Book of Lists (electronic version), National Center for Educational Statistics IPEDS online, and the Carnegie Classification of Institutions of Higher Education. See Appendix D for a listing of institutions included in the Carnegie Classification.

[26] During the period studied, institutions classified as "extensive" awarded 50 or more doctoral degrees a year across at least 15 disciplines where as those classified as "intensive" awarded at least ten doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall. For more details see *www.carnegiefoundation.org/Classification/.*

Figure 11. Classification of Higher Education Institutions in Kansas City, Select MSAs, and the Nation (2004)*

Type of Institution	Kansas City MSA (KS-MO)	Saint Louis MSA (MO pt)	Boston MSA (MA)	LA-Long Beach MSA (CA)	National
Doctoral/Research Universities—Extensive**	**0**	**2**	**7**	**6**	**151**
Doctoral/Research Universities—Intensive**	**1**	**1**	**2**	**2**	**110**
Master's Colleges and Universities	6	2	11	20	610
Baccalaureate Colleges	3	1	8	10	552
Associate's Colleges	10	9	20	60	1726
Specialized Institutions & Others***	13	11	31	39	793
TOTAL in Carnegie Database	33	26	79	137	3942

Notes:
(*) While the list was published in 2000, it has since been revised several times. The latest revision, reflected in this table, was in October 2004. The Carnegie Foundation expects to conduct a thorough reassessment of the classification in 2005.
(**) According to the Carnegie Classification, these institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. During the period studied, institutions classified as "extensive" awarded 50 or more doctoral degrees per year across at least 15 disciplines where as those classified as "intensive" awarded at least ten doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall.
(***) These institutions offer degrees that range from bachelor's to doctorate, and typically award a majority of degrees in a single field. The list includes only institutions that are listed as separate campuses in the *Higher Education Directory*. Specializations include theology, medical schools, health professions, engineering and technology, business, law, arts and music, maritime and military academies, etc. The others category included in this row includes Tribal Colleges and Universities.

Quantity is often an irrelevant indicator of quality. In case of doctoral degrees awarded, however, the two are closely linked. Production of doctoral students is directly proportional to intensity of research activity at an institution. It is related to the capacity of faculty to support research and expand knowledge in their respective fields.

UMKC, while having sizable undergraduate and professional degree programs, pales in comparison to a tier-one or "extensive" university like Washington University in Saint Louis. Both institutions have about the same number of students. Washington University has a slightly higher proportion of graduate students (Figure 12), amounting to 800 graduate students more at Washington University. Yet UMKC awarded 62 doctoral degrees in academic year 2002/2003 whereas Washington University awarded 233 doctorates. More than half or 120 of these degrees were in biological, physical, and computational sciences and engineering—fields critical to innovation within many of today's high-growth economies.

Figure 12. Enrollment and Doctoral Degrees Awarded in Academic Year 2002/2003

		UMKC	Wash U in St. Louis
Enrollment, Graduate & Undergraduate (2003)		14,226	13,020
Percent Graduate Student		36%	45%
Total Doctoral Degrees Awarded*		62	233
Distribution of Doctoral Degrees Awarded by Academic Field	Biological, Physical, Computational Engineering and Sciences	3	120
	Arts and Humanities	12	50
	Social Sciences	11	37
	Multi/Interdisciplinary Studies	36	15
	Business and Law	0	11

Notes:
(*) Data on degrees awarded will vary from year to year. But as the Carnegie 2000 Classification and its subsequent revisions suggest, very few shifts occur between categories within a four-year period.

Figure 13. Number of Doctoral Degrees Awarded within Specific Fields of Biological, Physical, Computational Engineering and Sciences* (Academic Year 2002/2003)

Number of Doctoral Degrees Awarded		Specific Doctoral Fields within Biological, Physical, Computational Engineering, and Sciences*
UMKC	Wash U	
	27	Cell/Cellular and Molecular Biology
2	14	Health Professions and Related Clinical Sciences
	13	Immunology
	13	Neuroscience*
	10	Chemistry, General
	6	Biochemistry
	6	Chemical Engineering
	5	Computer and Information Sciences and Support Services
	5	Physics, General
	4	Molecular Genetics
	3	Botany/Plant Biology
	3	Ecology, Evolution, Systematics and Population Biology, Other
	3	Electrical, Electronics and Communications Engineering
	3	Mechanical Engineering
	3	Microbiological Sciences and Immunology, Other
	3	Systems Engineering
	2	Biology/Biological Sciences, General
	2	Biomedical/Medical Engineering
	2	Geology/Earth Science, General
	2	Molecular Biophysics
	1	Engineering, Other
	1	Materials Science
1	1	Mathematics and Statistics
	1	Structural Engineering

Note:
(*) IPEDS of the National Center for Education Statistics classifies Neuroscience within the category of "Multi/Interdisciplinary Studies." The authors have included it here to show a fuller picture of sciences being studied at Washington University. The "Multi/Interdisciplinary" degrees awarded at UMKC were not identified by field of study and were categorized as "General."

Breaking down the specific doctoral fields within engineering and sciences further highlights the gap Kansas City has to bridge. Of the 24 engineering and science fields listed in Figure 13, UMKC offered PhD's only in two fields. Even then, the numbers were very small. As a reminder, St. Louis has two of these tier-one institutions, Boston has seven of them, and LA has six. They all have at least one or two tier-two universities.

While important, colleges and universities are only a part of the institutional infrastructure that can foster high rates of innovation. Research institutes, trade and professional organizations can also be critical to the generation and transfer of new and innovative ideas among firms. The sharing of knowledge and the informal networking these organizations foster can in turn speed up the process of innovation. Section V below discusses these organizations in Kansas City and the role they play in the Heartland economy.

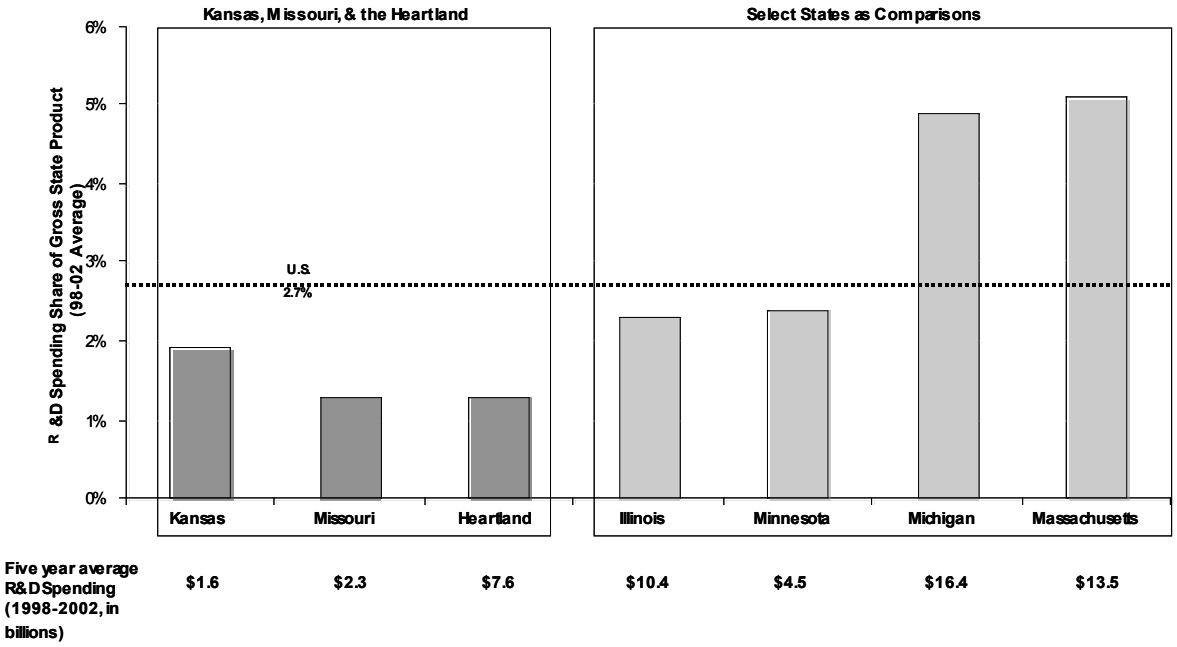
To be sure, there are historical, economic, and demographic reasons for concentration of such institutions in a few cities in the country. But if Kansas City is to compete by innovation and reap the economic benefits of such an approach, it must focus on finding the niche in which it can innovate and compete effectively. The industrial, occupational, and regional analysis in this report offer some suggestions. What seems clear, however, is that lack of a strong institutional infrastructure for research and innovation may pose an obstacle to Kansas City's medium- and long-term competitiveness.

C. Research and Development Activity

Another determinant of innovation is expenditures on research and development (R&D). Unfortunately, data on R&D expenditure is available only at the state level. As a proxy for Kansas City, we looked at the R&D spending in Missouri and Kansas, the states that the Kansas City metropolitan area straddles. As such, the numbers represent an amount much greater than is spent in Kansas City proper. Missouri numbers, for instance, also include amounts spent in St. Louis (Missouri part), a major R&D center. The Kansas numbers, on the other hand, include Wichita, which has a very large aerospace industry.

The data suggests that Kansas City invests very little in R&D. Combined, Missouri and Kansas spent $3.9 billion a year on R&D from all funding sources (industry, federal and state government, nonprofits, etc.). This is 1.5 percent of the combined gross state products (Figure 14). The average for all states is 2.7 percent. R&D-intensive states, such as Massachusetts and Michigan, spend an average of 5 percent of their gross state products each year.

Figure 14. R&D Spending, Total & Share of Gross State Product (Average of 1998–2002)

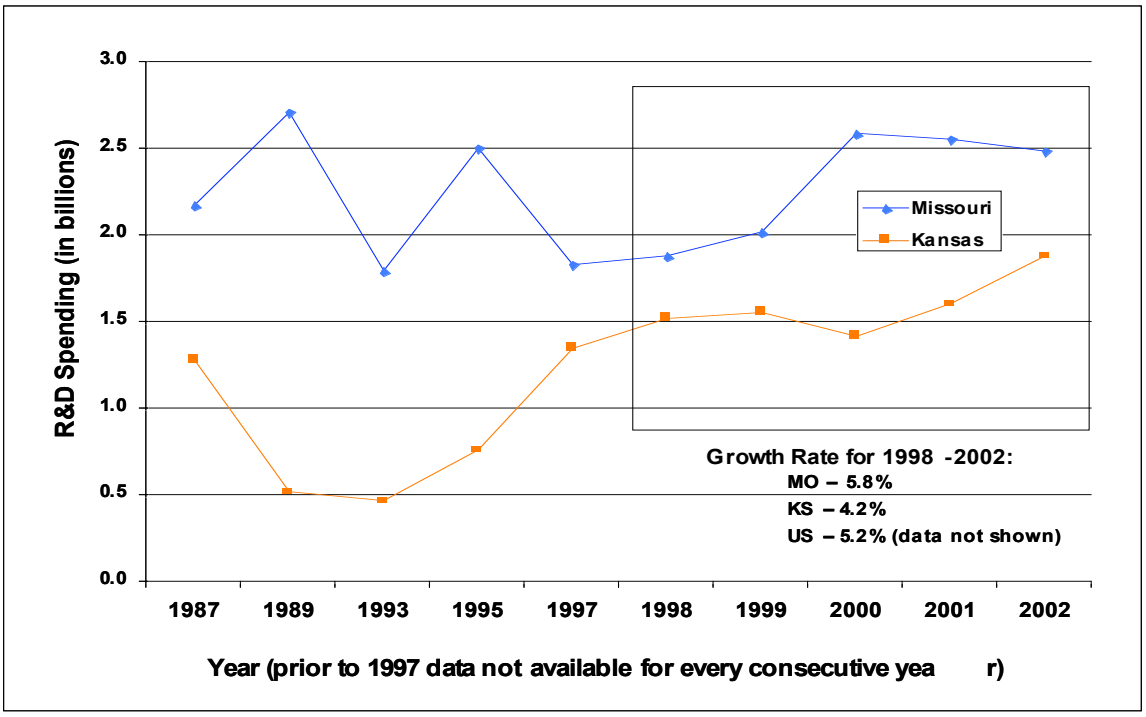


Moreover, neither state is growing its R&D spending fast enough to catch up any time soon. Kansas in fact has lost some ground. Between 1998 and 2002, Kansas lagged the U.S. growth rate by a full percentage point—growing at a rate of 4.2 percent per year compared to the U.S. average of 5.2 percent (Figure 15).

Missouri showed more promise. Its increase of 5.8 percent a year was slightly above the U.S. average. At this rate, however, Missouri wouldn't reach the R&D spending levels of R&D-intensive states like Massachusetts, Michigan, and Maryland until the year 2050! In contrast to Missouri's 1.3 percent of gross state product (GSP), these states have an average of 5 percent of their GSP's spent on R&D.

To reach funding levels achieved by R&D-intensive states within a decade, Missouri would have to triple its spending growth from its current rate of 5.8 percent to 18 percent a year. Kansas would also have to triple its growth rate of 4.2 percent so that within a decade it can achieve a level of funding comparable to R&D-intensive states.

Figure 15. Changes in R&D Investments (1987–2002)

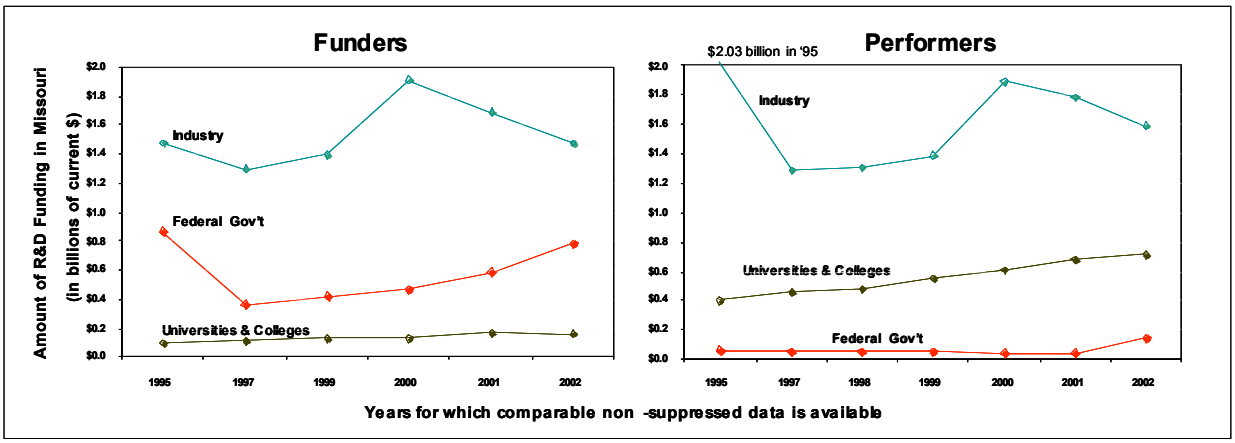


While Kansas City lacks a sizable base of research universities and institutes to absorb larger amounts of R&D funding, the low levels of R&D activities cannot be entirely explained by this. In Missouri universities and research institutes are a relatively small part of the spending formula. In 2002, they performed $700 million, or 29 percent, of all the R&D activities in Missouri (Figure 16).

The lion's share of the funding and performance of R&D in that state, as in other parts of the country, is carried out by private industry. In 2002, private industry spent $1.6 billion or 64 percent of the $2.5 billion of R&D activity in Missouri.

Kansas City's academic and research institutions, including the recently created Stowers Institute for Medical Research, can help increase the flow of R&D dollars to Kansas City. However, the levers of public policy and civic initiatives should equally, if not more intensely, focus on private industry's investment in R&D.

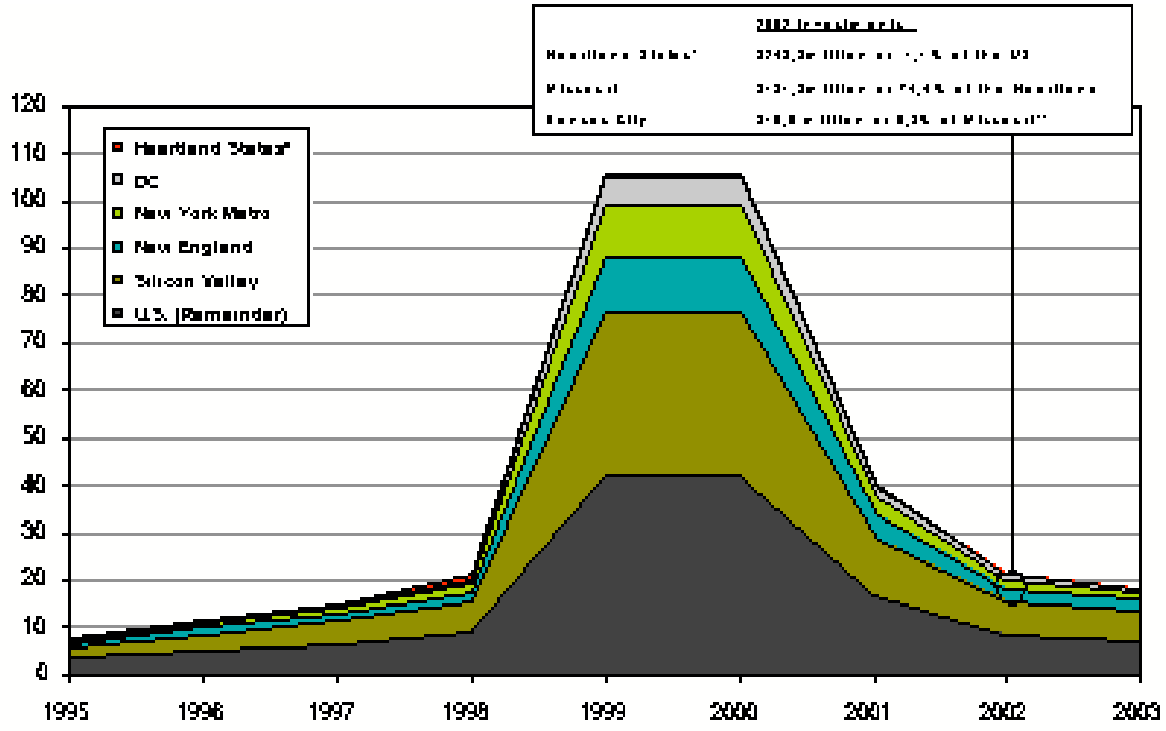
Figure 16. R&D Funders and Performers in Missouri (1995-2002)



D. Venture Capital Funding

Similar to the R&D funding data, venture capital investment data is not readily available at the metropolitan level. We've used a combination of state-level and Kansas City specific data to converge on a comparative investment picture.

Figure 17. Venture Capital Investment in the U.S. and Heartland (1996–2003); Focus on Missouri and Kansas City (2002)



Note(s): (*) Venture capital data is not available at the level of metropolitan statistical areas. To estimate the Heartland share, the total sum of the investments in all the Heartland states were used. The Heartland states include Arkansas, Iowa, Kansas, Missouri, Nebraska, and Oklahoma. (**) Most of the venture capital investments into Kansas City went to the Missouri side. Moreover, the state of Kansas received close to $7 million in 2002 investments, a sum too small to impact the overall analysis.

Venture capital investments, essential to commercializing innovation, are very scarce in Kansas City and the Heartland region as a whole. In 2002, the six states of the Heartland region received just over one percent of total venture capital investments in the country (Figure 17). While Missouri received a big portion of the Heartland investments —74 percent of the Heartland total—Kansas City was not a major target. Longitudinal data also indicates that the Heartland region did not benefit much from the venture capital boom of 1998 to 2000.

Based on these observations, we can conclude that, despite being well positioned to generate innovation, Kansas City trails other areas, possibly due in part to little investment in R&D, scarce availability of venture capital, and a weak institutional infrastructure. While Kansas City has experienced fast employment growth and kept wages high, medium- and long-term competitiveness of the region may be compromised if deficiencies continue.

V. Regional Connectivity

This section turns to a different, and in many respects newer, type of analysis, centered on the geographic dimension of economic activity. While in the past the field of economic geography has received little attention, there is now increased appreciation among economists and practitioners of the importance of the distribution of economic activity across space, and increased interest in the opportunities that arise from the connections between city, metropolitan, and regional economies.

A. Theoretical background

Before presenting the findings on regional connectivity, it is helpful to address three questions: Why should the focus be on the region, rather than on Kansas City alone? What do we mean by region (i.e. how can we identify a meaningful unit of analysis)? And what are the economic opportunities that arise from regional connections? The answers to these questions provide the backdrop for the findings presented in section V.B.

1. The Importance of Geography

Kansas City's economy does not coincide with political boundaries. The economic assets and activities of the city and metropolitan area are embedded in broader economic markets. Goods and services produced in Kansas City are traded elsewhere, while the inputs used by Kansas City's firms similarly come from other places.

The varied market places in which Kansas City's inputs and products are traded create a set of relationships that tie Kansas City's economy to other metropolitan areas and to the larger national and global economies. These economic ties encompass different geographies for different activities and services. For example, specific housing markets, labor markets, and business-to-business markets operate over quite different areas.[27]

These relationships are particularly important when we try to understand how to strengthen Kansas City's assets, as they provide the economic context in which these assets are deployed. Moreover, as shall become more apparent from the analysis below, cities within regions often have the opportunity to play specific economic roles for the hinterlands and within the regional economy. Understanding the geography of varied economic activities helps identify and leverage these opportunities.

2. What is an Economic Region?

For economic development purposes, it is particularly useful to focus the analysis of economic geography on the region. As discussed above, agglomeration or concentrations of related economic activity are critical to prosperity: Connected networks of people and firms are an essential ingredient of today's business environment, and the synergies that arise from these connections often occur on a regional scale. At the same time, the rise of

[27] In further stages of work, as specific economic activities are further analyzed, it will be possible and productive to identify particular geographic markets associated with particular activities.

global markets makes national boundaries less relevant and reorganizes the geography of the world economy around regional centers of production.[28] The region is emerging as a key unit of economic analysis because it is large enough to compete in global markets, but small enough to benefit from network and agglomeration economies.

However, despite the amount of work that has been done on regional economies, "region" remains a loose term. Its definitions vary widely, and for the most part depend on the object and purpose of the analysis. In the context of the global economy, Southeast Asia can be considered a region, characterized by common markets and nations with similar economic characteristics. Within the United States, the Census Bureau defines regions as four major groups of states: the Northeast, the Midwest, the West, and the South. When people talk about regions like the Heartland, or the Great Lakes region, they usually refer to groups of states and metropolitan areas linked by specific economic or political ties; finally, much of the regionalist debate in the field of economic development focuses on regions defined as single metropolitan areas, composed of a central city and its suburbs.

At a basic conceptual level, a region is a set of smaller units (often defined by political boundaries: cities, counties, states, etc.) that are contiguous in space and are grouped together based on a set of defining features. The criteria used to select these features vary depending on the object of the analysis (hence the diversity of possible regions): A meteorologist studying weather patterns might define a homogenous region based on its climatic characteristics, while a researcher focusing on infrastructure efficiency might define a region based on the connections between nodes in a power or transportation grid. A region can thus be composed of units that share one or more features, as in the case of the Sun Belt (where the unifying factor is the weather), or be defined based on the integration of functions and activities across its sub-units.

This criterion, referred to as "functional integration," requires that the units that form a region be not necessarily similar, but integrated and codependent. Indicators of functional integration are movements of goods and services, labor and money flows, the frequency of phone calls, or other measures of transactions among areas. The region in this case is composed by areas that are economically interdependent and interact with one another more than with areas outside of the region.

Given the purposes of this study and its focus on economics, we are interested in a region defined by economic relationships and functional integration. This means that the regional boundaries are necessarily somewhat flexible, as different markets will tie different places together. For instance, a region defined by functional integration in processing agricultural products might be very different from a region defined by functional integration in business services, even if both regions have the same center. The purpose here is not to define exact regional boundaries, but rather to begin to get a sense of the regional connections between Kansas City and the surrounding metropolitan areas, and of the economic opportunities that these connections create.

---

[28] See Paul Knox and John Agnew, *The Geography of the World Economy* (New York: Edward Arnold, 1998).

3. Regional Opportunities

Economic development interventions often begin with the realization that there is a disconnect between economic and political units: Neighborhood, city, and even MSA boundaries do not conform to market boundaries. For this reason, market-based development at the neighborhood level needs to take into account the economy of the city and the metropolitan area, and development interventions at the city level need to take into account the relationship between central city and suburbs. While the metropolitan area, unlike the neighborhood and the city, is large enough to make sense as an economic unit, looking beyond the metropolitan boundaries and focusing on the regional level can reveal additional opportunities.

These opportunities can be broadly grouped into two categories: "hub functions" and "market linkages."

The first type of regional opportunity accrues to those metropolitan areas that, due to their size and characteristics, perform key hub functions for their surrounding areas. These urban areas are sometimes referred to as "regional metropolises."[29] A regional metropolis provides a critical mass of key functions and services to its hinterland and to other metropolitan areas within the region, and houses important industries that are core to the economy of the region. For example, a regional metropolis might have a higher concentration of key business services that support local headquarters as well as corporations located in the rest of the region. A regional metropolis generally would also be an important infrastructural node for transportation, logistics, and telecommunication. It would likely serve as a business and networking center, housing headquarters, conventions, research centers, and business associations. Finally, a regional metropolis might be characterized by the fact that it houses important cultural institutions and attracts visitors and residents from other metropolitan areas. All of these functions are an important source of revenue and contribute to the health of the local economy.

The second type of regional opportunity directly flows from the earlier observation that the key assets of a metropolitan economy need to be understood in the context of their market place. Different markets will tie Kansas City, for example, to different places, and some of these ties will be more important than others, depending on the industry or function that economic development interventions are focusing on. For instance, if the industry targeted for intervention is transportation and warehousing, there might be important connections with Wichita, while if there is an interest in strengthening the telecommunication industry, ties with Lincoln or Omaha might be more important. These connections can reveal some of the reasons behind the performance of specific industries and inform targeted interventions, and they can help develop strategic partnerships with businesses and leadership groups in other metropolitan areas. While this is a promising area of investigation, this preliminary examination can only scratch the surface of these issues.[30]

---

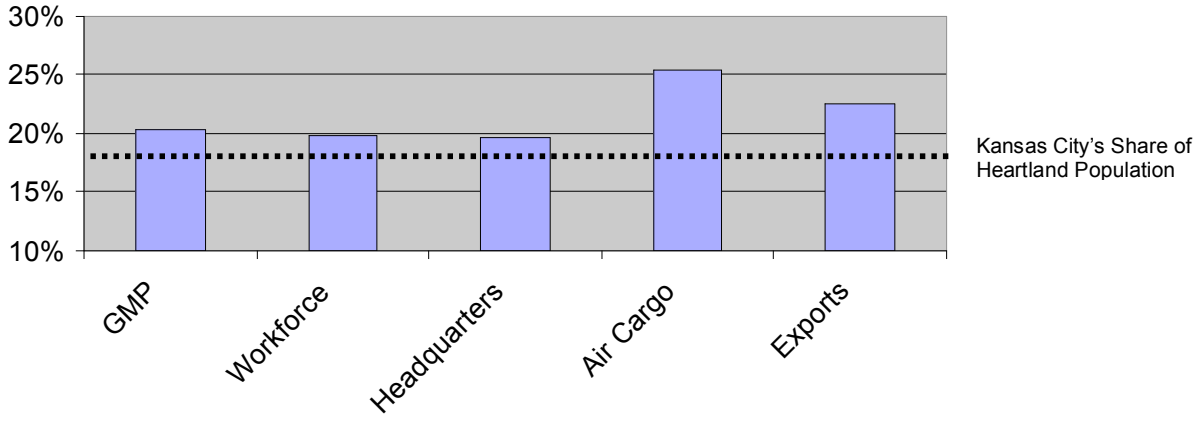
[29] See, e.g., Otis Dudley Duncan et al., *Metropolis and Region* (Baltimore: The Johns Hopkins Press, 1960).
[30] As discussed with respect to next steps, below, more formal, in-depth analysis would be needed to positively specify the most promising regional economic linkages of this type.

The rest of this section will examine Kansas City's role in the region, starting with an analysis of its position within the region with respect to the hub functions outlined above, and then investigating the linkages that connect its economy to the other metropolitan areas in the Heartland.

B. Kansas City as a "Regional Metropolis"

Kansas City is an important economic engine for the Heartland as a whole, housing a disproportionate percentage of its key assets. It is the second largest metropolitan area in the region and, while its population constitutes roughly 18 percent of the Heartland, it represents, by varied measures, over 20 percent of the regional economy.

Figure 18. Kansas City's Share of Heartland's Economy



Due to its size and position, Kansas City has many of the characteristics of a regional metropolis: It is a business networking center; it performs important hub functions with respect to transportation and logistics; and it is an important cultural center, providing amenities to, and attracting visitors from, the surrounding region.

1. Business

Key Findings:

- Kansas City is the preferred location for mid-size companies' headquarters.
- The firms that have headquarters in Kansas City are concentrated in knowledge-intensive industries.
- Kansas City is an important business networking center for the region.

As a regional metropolis, Kansas City serves as a business and networking center for the Heartland, housing important functions and structures such as headquarters, convention centers, and business organizations.[31] Kansas City and St. Louis have by far the greatest

[31] Analysis of point-level business data, combined with employment patterns by industry and occupation, was undertaken to assess Kansas City's role in the Heartland with respect to this dimension. Data on

share of the headquarters located in the region, accounting for a combined 45 percent of all of the headquarters in the Heartland. However, St. Louis disproportionately houses the headquarters of the largest companies in the region (defined as corporations or partnerships with over 5,000 employees): 31.6 percent of the businesses in this category are located in St. Louis, while only 13.5 percent are located in Kansas City, and 10.5 percent in Des Moines.

Figure 19. Headquarters of Corporation/Partnerships with Over 5,000 Employees (2004)

MSA Name	# of Headquarters	% Total
St. Louis, MO-IL	42	31.6
Kansas City, MO-KS	18	13.5
Des Moines, IA	14	10.5
Omaha, NE-IA	13	9.8
Oklahoma City, OK	12	9.0
Wichita, KS	8	6.0
Little Rock, AR	7	5.3
Tulsa, OK	7	5.3
Springfield, MO	5	3.8
Lincoln, NE	4	3.0
Topeka, KS	3	2.3
Lawrence, KS	0	0
Total	133	100.0

On the other hand, Kansas City dominates with respect to smaller companies (250 to 5000 employees). Though barely half the population of St. Louis, Kansas City hosts 20 percent of these headquarters in the region, compared to 25 percent for St. Louis.

Figure 20. Headquarters of Corporations/Partnerships with 250–5,000 Employees (2004)

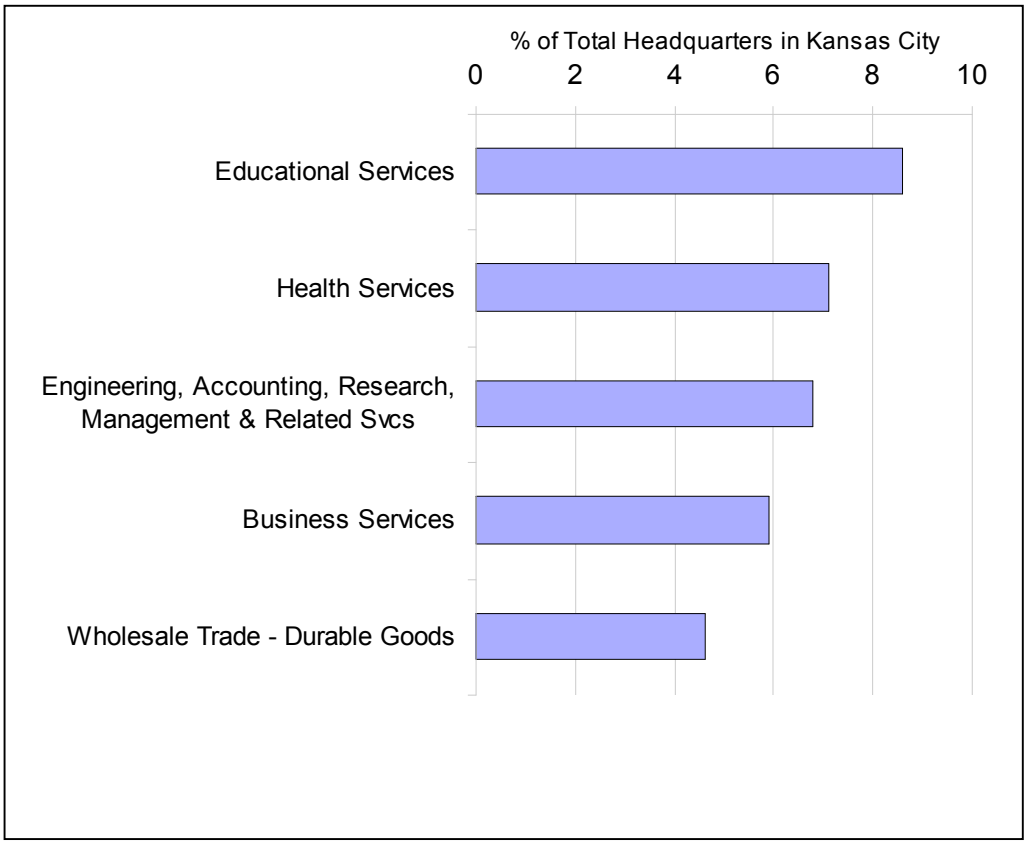
MSA Name	# of Headquarters	% Total
St. Louis, MO-IL	520	25.6
Kansas City, MO-KS	409	20.1
Oklahoma City, OK	196	9.6
Omaha, NE-IA	169	8.3
Tulsa, OK	162	8.0
Des Moines, IA	144	7.1
Wichita, KS	139	6.8
Little Rock, AR	111	5.5
Lincoln, NE	64	3.1
Springfield, MO	61	3.0
Topeka, KS	45	2.2
Lawrence, KS	15	0.7
Total	2,035	100.0

---

headquarters was obtained from Dun and Bradstreet, while the analysis of employment patterns used County Business Patterns and Occupation Employment Survey data.

Examining the composition of these headquarters by broad industry groups reveals that Kansas City's headquarters are concentrated in knowledge intensive industries such as educational services, health services, engineering, accounting, research, management and related services, and business services.

Figure 21. Kansas City's Headquarters by Industry (2004)



Given the high concentration of headquarters, it is not surprising that Kansas City also serves as an important business networking center in the region. The role of Kansas City in this respect was measured by looking at the concentration of business organizations in the largest metropolitan areas in the region.

Within the Heartland, Kansas City houses 22.4 percent of the total regional employment in business, professional, labor, and political organizations.[32] St. Louis has the largest share, with 25.2 percent, and Oklahoma City is third, with 11 percent.[33] Among the five largest cities in the region, Kansas City has the highest concentration of business, professional, labor, and political organizations.

[32] Based on 2001 County Business Patterns data on employment by industry.
[33] These organizations employ 0.47 percent of Kansas City's workforce, which is slightly above the regional average of 0.42 percent (the Heartland location quotient for Kansas City in this category is 1.1).

Kansas City also has the highest concentration of meeting and convention planners (location quotient of 1.2), and is second in absolute numbers only to St. Louis (400 workers in this category compared to 480 in St. Louis).[34]

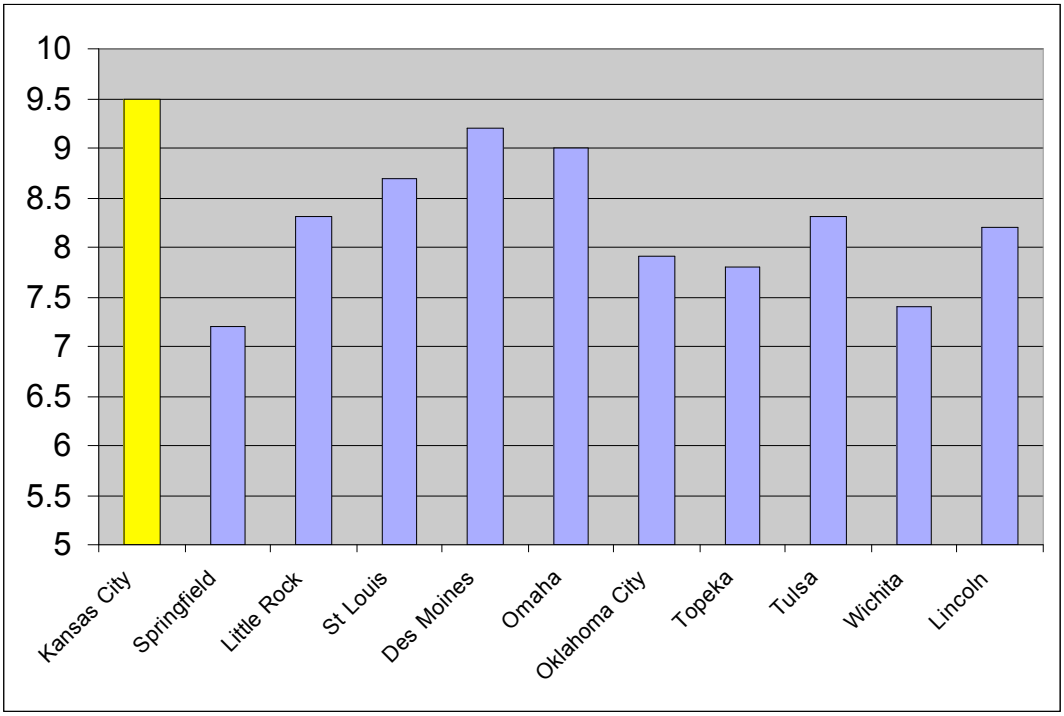
The comparative analysis of broad occupational concentrations in the Heartland metropolitan areas confirms the role of Kansas City as an important business center for the region: 9.5 percent of the Kansas City workforce is employed in management occupations, the largest share in the Heartland and 1 percentage point above the national and regional average.[35] As noted above, Kansas City also has a high concentration of chief executives, which at 0.5 percent is second in the region only to St. Louis (0.6 percent).[36]

Figure 22. Employment in Business Organizations (2001)

MSA Name	Total Employment in Business, Professional, Labor, and Political Organizations	Share of Heartland's Employment in These Categories (%)	Heartland Location Quotient
St. Louis	4,717	23.9	0.9
Kansas City	4,190	21.2	1.1
Oklahoma City	2,063	10.4	1.1
Des Moines	1,872	9.5	1.6
Little Rock	1,644	8.3	1.3
Tulsa	1,206	6.1	0.7
Omaha	1,116	5.6	0.7
Wichita	881	4.5	0.8
Lincoln	860	4.4	1.5
Topeka	720	3.6	2.1
Springfield	294	1.5	0.4
Lawrence	174	0.9	1.1

[34] Source: Bureau of Labor Statistics, Occupational Employment Statistics (2003).
[35] Source: 2000 Census.
[36] Source: Bureau of Labor Statistics, Occupational Employment Statistics (2003).

Figure 23. Share of Employment in Management Occupations (2000)

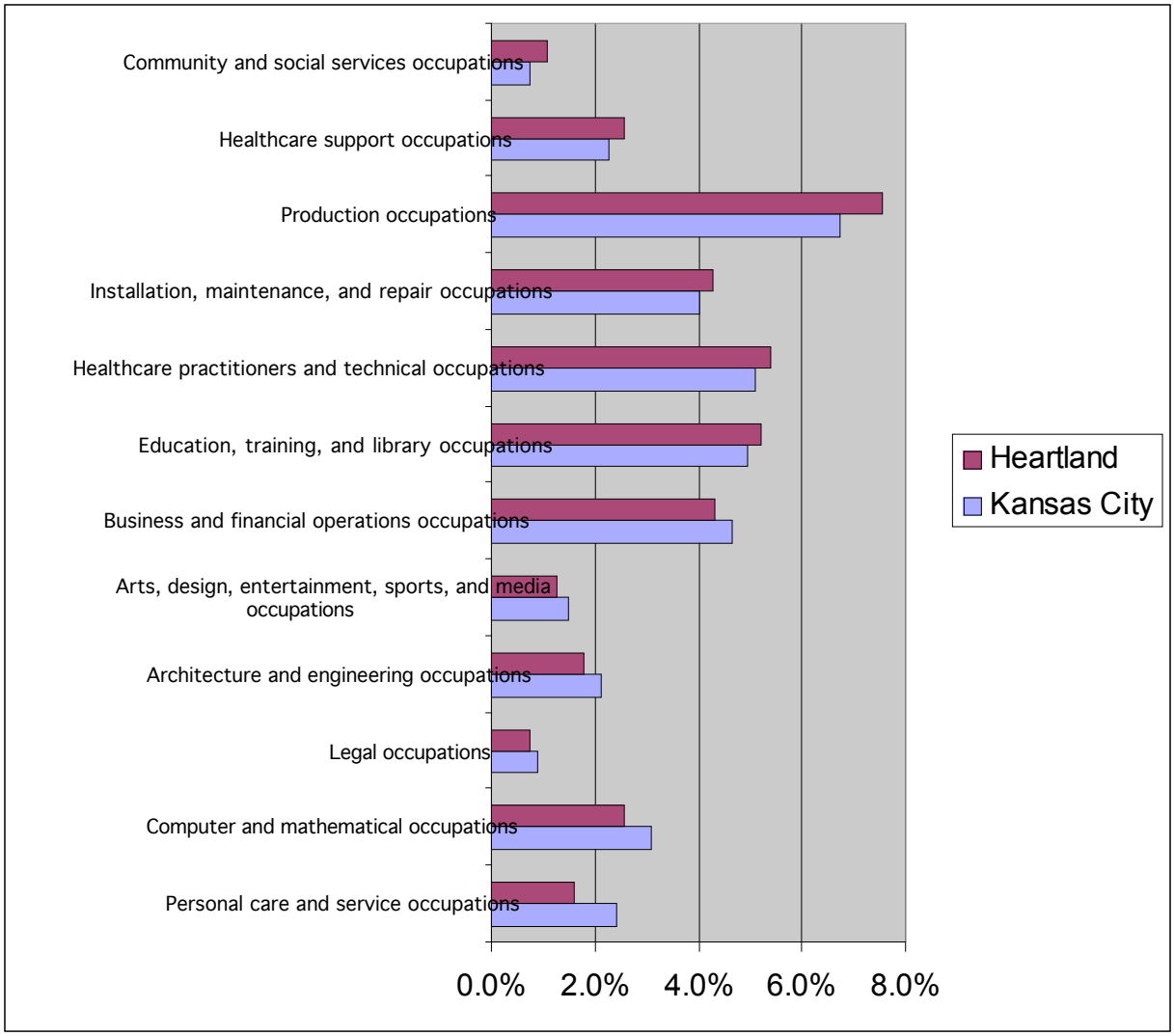


Compared to the rest of the region, Kansas City has a higher concentration of professional occupations, particularly management and business and financial operations occupations. At the same time, Kansas City has a lower percentage of production occupations and household services. Its concentration of sales and office and administrative support occupations are approximately the same as the regional average.

The chart below depicts the broad occupational categories in which Kansas City's share of employment is either below or above the regional average:[37]

[37]Based on the 2003 Occupational Employment Statistics provided by the Bureau of Labor Statistics.

Figure 24. Employment Share by Occupation (2003)



Looking in more detail at the occupations that are more highly concentrated in Kansas City compared to the rest of the region, we find that Kansas City plays an important role in the Heartland with respect to several of the functions highlighted in Section III.

Consistent with the presence of a professional services cluster, Kansas City is a regional center for market research and advertising.[38] The region is also a center for a set of clerical and office support occupations.[39] Kansas City also houses a disproportionate share of accountants, insurance underwriters, job analysts, appraisers, and cost estimators.

Consistent with the occupational concentrations mentioned in section III, Kansas City also has a leading role as a high tech/engineering center in the region, with a high

[38] Occupations with high location quotients in this group are market research analysts, advertising sales agents, advertising and promotions managers, public relations specialists, and graphic designers.
[39] These include first line supervisors/managers of office and administrative support workers; stock clerks and order fillers; file clerks; receptionists and information clerks; billing and posting clerks; order clerks; switchboards operators; telephone operators; and data entry keyers.

concentration of engineers and computer analysts and programmers.[40] Other scientific occupations highly concentrated in Kansas City include chemists, biological technicians, medical scientists, and atmospheric and space scientists, suggesting the presence of research functions with respect to these fields.

2. Logistics

Key Findings:

- Kansas City's position at the center of a six-state area makes it an important transportation node.
- Kansas City's airport handles a disproportionate share of the air cargo traffic going through the region.
- The transportation industry in Kansas City is a key component of the local and regional economy.

Given its infrastructure and location, it is not surprising that Kansas City is a major transportation hub for the Heartland. Most of the major East-West and North-South highways and railroads in the region go through Kansas City. As discussed earlier, the transportation and warehousing industry is a major component of Kansas City's economy. This role can be further confirmed and explored through three other elements: comparative analysis of airport traffic for passengers and cargo; shipments between Kansas City and other metropolitan areas; and comparative analysis of transportation-related occupations.

A comparative analysis of the flow of cargo in the main airports within the region reveals that Kansas City handles a disproportionate amount of the air cargo going through the Heartland. The table below reports the tons of cargo that went through each airport in 2003 and how each ranks among the largest 146 airports in the country.[41]

Figure 25. Cargo Traffic by Airport (2003)

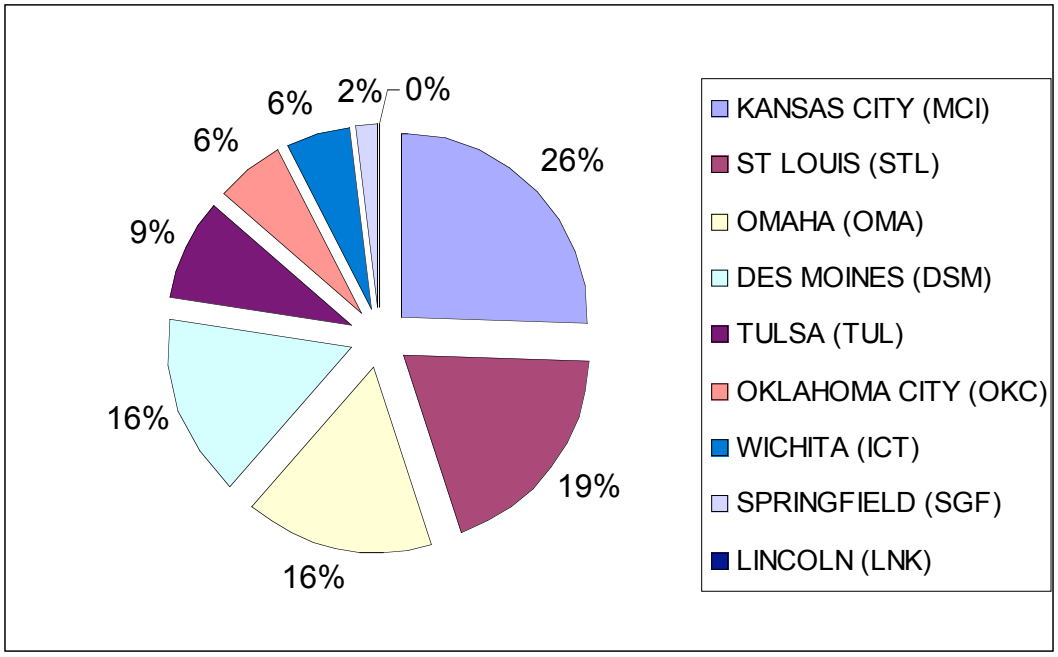
Airport (Code)	Cargo (Tons)	National Rank
KANSAS CITY, MO (MCI)	138,537	37
ST. LOUIS, MO (STL)	105,693	46
OMAHA, NE (OMA)	89,037	52
DES MOINES, IA (DSM)	88,581	53
TULSA, OK (TUL)	48,340	68
OKLAHOMA CITY, OK (OKC)	32,265	79
WICHITA, KS (ICT)	30,639	81
SPRINGFIELD, MO (SGF)	10,362	105
LINCOLN, NE (LNK)	10	146
TOPEKA, KS (FOE)	N/A	N/A
LITTLE ROCK, AR	N/A	N/A
LAWRENCE, KS	N/A	N/A

[40] In particular, occupations with high location quotients compared to the Heartland include civil and mechanical engineers, sales engineers, chemical engineers, environmental engineers, operating engineers, and health and safety engineers, as well as computer system analysts, programmers, computer support specialists, and software engineers.

[41] Source: 2003 ACI North America Airport Traffic Report

These numbers, illustrated in the chart below, show that Kansas City handles the largest share of the air cargo going through the region, and is the main regional hub with respect to this function.

Figure 26. Heartland Cargo Traffic by Airport (2003)



A quick comparison of the aggregate figures for shipments to and from the three largest MSAs in the region (St. Louis, Kansas City, and Oklahoma City), measuring the flow of goods by all means of transportation, reveals that Kansas City is second behind St. Louis but far ahead of Oklahoma City.[42]

Figure 27. Kansas City Shipments by Origin and Destination, Weight

MSA Name	Shipments in Thousands of Tons		
	To	From	Total
St. Louis	112,749	108,910	221,659
Kansas City	69,153	59,906	129,059
Oklahoma City	28,099	28,236	56,335

Figure 28. Kansas City Shipments by Origin and Destination, Value

MSA Name	Value of Shipments in Millions of $		
	To	From	Total
St. Louis	73,197	71,196	144,393
Kansas City	57,970	56,091	114,061
Oklahoma City	23,233	23,305	46,538

[42] See section V.C below for details on the dataset used for this part of the analysis.

While there is a significant gap between St. Louis and Kansas City shipments in terms of weight, the gap narrows when we compare the aggregate value of the shipments to and from each city. This could mean that St. Louis handles more raw materials, while Kansas City is the preferred hub for finished goods.[43] Unfortunately, this dataset does not show the total amount of goods that transit through Kansas City, since it focuses solely on points of origin and final destinations.

In order to supplement this information, it is possible to analyze the role of Kansas City with respect to logistics by comparing its share of earnings in transportation industries and its share of employment in transportation-related occupations to that of other metropolitan areas in the Heartland.

Kansas City has the highest earnings in transportation industry among all of the cities in the Heartland, both in absolute terms and as a percentage of total earnings:[44]

Figure 29. Transportation Earnings by City (2000)

MSA Name	Earnings in Transportation and Public Utilities ($1,000s)	Transportation and Public Utilities as % of Total Earnings
Kansas City, MO-KS	5,539,975	12.6
St. Louis, MO-IL	4,612,464	7.8
Tulsa, OK	2,126,805	11.9
Little Rock-North Little Rock, AR	1,248,880	10.2
Oklahoma City, OK	1,227,930	5.9
Des Moines, IA	652,282	5.5
Wichita, KS	551,386	4.7
Springfield, MO	498,239	8.3
Lincoln, NE	487,519	8.9
Topeka, KS	342,378	8.9
Omaha, NE-IA	N/A	N/A

These figures, based on earnings, are consistent with the analysis of employment by industry presented above. The transportation industry is the ninth largest employer in Kansas City, constituting 4 percent of its workforce.[45] Moreover, Kansas City has the second largest workforce employed in transportation and warehousing in the region: 22.8 percent of the people employed in transportation and warehousing in the Heartland work in Kansas City.

[43] As mentioned below, the difference between weight and value of the shipments is an indicator of the type of commodity that is being shipped.

[44] This information is derived from the 2000 Regional Economic Information System (REIS) data compiled by the Bureau of Economic Analysis. Since REIS data is sometimes suppressed for confidentiality reasons, it is possible that some of these numbers underestimate actual earnings, particularly in the case of Des Moines. Moreover, since this category includes utilities as well as transportation, we must be careful in interpreting these results. At the same time, though, employment data confirms the primary role of Kansas City in the region with respect to transportation.

[45] Employment data comes from 2001 County Business Patterns.

Among the other Heartland metropolitan areas, only St. Louis has more people employed in this industry (40,300 compared to 36,800 in Kansas City), though this represents a lower concentration and a lower location quotient with respect to the Heartland (0.9 compared to 1.1 in Kansas City). While four other metropolitan areas in the region have a higher location quotient in transportation and warehousing (Lincoln, Little Rock, Omaha, and Springfield), the transportation workforce in Kansas City is almost as large as that of these four cities combined.

3. Amenities

Key Findings:

- Kansas City is an important cultural center within the Heartland, with high concentrations of museums and art galleries.
- Kansas City attracts a high number of out of town visitors.
- Kansas City acts as a "population magnet," attracting residents from the other metropolitan areas in the Heartland.

In addition to being a business and transportation hub for the region, Kansas City is also an important cultural center in the Heartland. Kansas City ranks 49 out of 154 MSAs for number of museums and art galleries, and it ranks 42 out of 250 in the Places Rated Almanac's Art Score.[46] Within the region, Kansas City is second for total number of museums and art galleries behind St. Louis, but has a higher concentration of museums and art galleries than St. Louis (0.99 per 100,000 people compared to 0.85 in St. Louis).

Figure 30. Museums (1997)

MSA Name	Museums (#)	Rank (Out of 154)
St. Louis, MO--IL MSA	22	30
Kansas City, MO--KS MSA	17	49
Oklahoma City, OK MSA	11	77
Wichita, KS MSA	10	85
Tulsa, OK MSA	9	93
Omaha, NE--IA MSA	8	99
Des Moines, IA MSA	6	111
Little Rock--North Little Rock, AR MSA	5	123
Lincoln, NE MSA	N/A	N/A
Springfield, MO MSA	N/A	N/A
Topeka, KS	N/A	N/A
Lawrence, KS	N/A	N/A

[46] The Art Score is a measure computed for the Places Rated Almanac based on the number of cultural institutions such as museums, fine arts and public radio stations, public television stations, universities offering a degree in the arts, symphony orchestras, theaters, dance companies, and public libraries. See David Savageau, Places Rated Almanac, Macmillan (New York, NY, 1999).

Consistent with its role as a cultural and business center, Kansas City attracts a large number of out of town visitors, as shown by its high number and concentration of hotels and motels. Kansas City ranks 52nd out of 250 MSAs for number of hotels, and it is second in the region behind St. Louis. While St. Louis has a higher number of hotels, Kansas City has a higher concentration, with 12.07 hotels and motels per 100,000 people compared to 9.46 in St. Louis.

Figure 31. Hotels and Motels (1997)

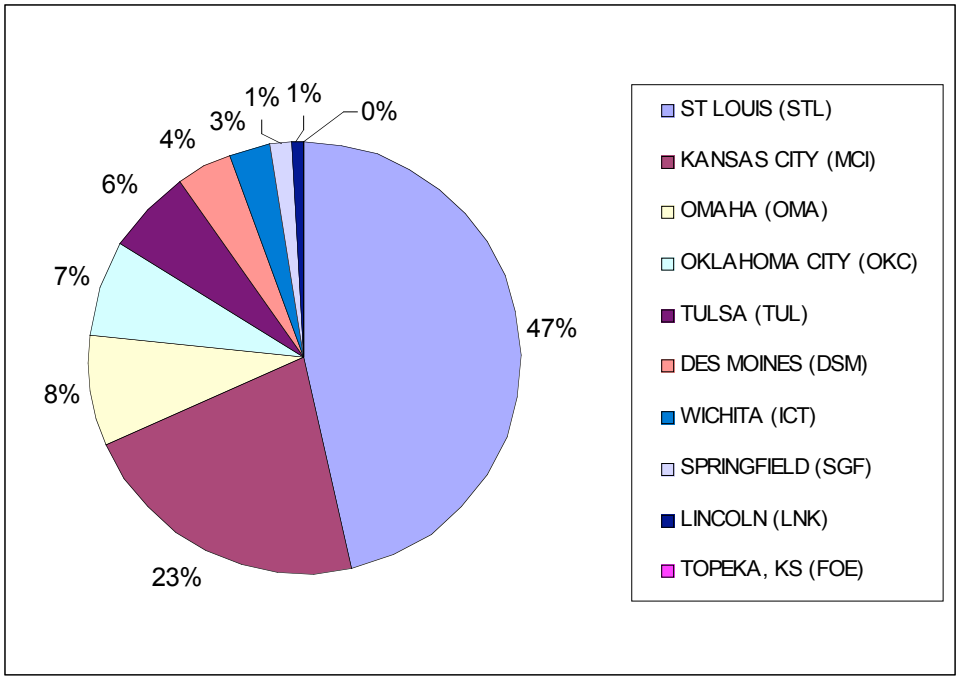
MSA Name	Hotels and Motels (#)	Rank (Out of 250)
St. Louis, MO--IL MSA	244	41
Kansas City, MO--KS MSA	208	52
Oklahoma City, OK MSA	132	79
Tulsa, OK MSA	93	105
Little Rock--North Little Rock, AR MSA	90	107
Omaha, NE--IA MSA	76	124
Des Moines, IA MSA	75	125
Wichita, KS MSA	73	129
Springfield, MO MSA	58	150
Lincoln, NE MSA	40	195
Topeka, KS	N/A	N/A
Lawrence, KS	N/A	N/A

The hotel and lodging industry is the 20th largest employer in KC, and represents a significant cluster in the region, with a location quotient of 1.2. Despite a lower total number of establishments, Kansas City's hotels and motels employ almost the same number of people (12,072) as St. Louis'(12,311).[47] This could indicate that Kansas City hotels handle on average more guests than the hotels in St. Louis.

The passenger traffic through Kansas City's airport is another indicator of the number of visitors going through the metropolitan area. Kansas City International Airport handles almost 10 million passengers per year, equal to 23 percent of the passenger traffic in the region. These figures are second in the region only to Lambert-St. Louis, which seems to be in a category of its own, handling over 20 million people per year.[48]

[47] Employment figures are based on 2001 County Business Patterns data on employment by industry.
[48] Source: 2003 ACI North America Traffic Report.

Figure 32. Heartland Passenger Traffic by Airport (2003)



Finally, Kansas City's prominent role within the region is highlighted by the fact that it acts as a "population magnet," attracting people from the other metropolitan areas in the Heartland, including St. Louis. A recent report by MARC shows that Kansas City attracts population from all of the major cities in the region, with the exception of Little Rock and Tulsa. In fact, all of these metropolitan areas are among the top 15 for net migration to Kansas City, as illustrated below:[49]

Figure 33. Top Net Migration Metropolitan Areas, 1993–2000

MSA Name	Net In-Migration to Kansas City
Los Angeles-Riverside-Orange County	5,072
Wichita	**3,792**
Omaha	**2,316**
New York-Northern New Jersey-Long Island	2,230
Topeka	**2,228**
Chicago-Gary-Kenosha	1,983
Lawrence	**1,588**
St. Joseph	1,442
St. Louis	**1,437**
Lincoln	**1,191**
Des Moines	**1,089**
Columbia	1,030
Oklahoma City	**823**
San Diego	785
Springfield	**588**

[49] Source: MARC, "Migration in the Kansas City Area," March 2002

The findings on business, transportation, and cultural functions presented in this section reveal that Kansas City does in fact play many of the roles that characterize a regional metropolis, and is an important hub for a variety of activities within the Heartland. The leading role that Kansas City plays within its region is an important component of its economic performance. The next section will explore the second aspect of connectivity—the economic linkages that arise from the existence of common regional markets for particular industries.

C. Economic Linkages

This section provides an initial scan of economic linkages between Kansas City and the regional economy. While much more targeted research would be needed to specify particular linkages and estimate their impact on Kansas City's economy, the observations reported here allow us to formulate some hypotheses with respect to promising economic connections between Kansas City and the surrounding metropolitan areas. From here we can begin identifying development opportunities flowing from these connections.

1. Flow of Goods

Key Findings:

- Based on shipment patterns, Kansas City's economy is oriented primarily towards the Heartland.
- The flow of goods between Kansas City and St. Louis confirms strong connections between the economies of these two metropolitan areas.
- The flow of goods between Kansas City and the other metropolitan areas in the region (Tulsa and Oklahoma City in particular) appears to be primarily in raw materials.
- Kansas City has important economic ties with metropolitan areas outside of the Heartland, including Chicago, Detroit, and Los Angeles.

The flow of goods between metropolitan areas is a powerful indicator of economic connections. Metropolitan areas that have closer economic ties will likely be characterized by a greater movement of goods between them, as firms ship raw materials and finished products from one place to another.[50]

[50] The data source used for this component of the analysis is the 1997 Commodity Flow Survey, collected by the Bureau of Transportation Statistics. The survey collects data from a sample of 100,000 domestic establishments randomly selected from a universe of about 800,000 establishments engaged in mining, manufacturing, wholesale, warehouses of multi-establishment companies, and some selected activities in retail and service. Each selected establishment reported information such as weight, value, and mode of transport for a sample of about 25 outbound shipments for a one-week period in each of four calendar quarters in 1997. Unfortunately the data is available below the state level only for the 50 largest metropolitan statistical areas and for the remainder of the states in which they are located. This means that, in the Heartland, data at the MSA level is available only for Kansas City, St. Louis, and Oklahoma City. Shipments to and from the other metro areas we are interested in are included in the figures for "Remainder of Kansas," "Remainder of Missouri," "Remainder of Oklahoma" and for the states of Nebraska, Iowa, and Arkansas. "Remainder of Kansas" refers to the state of Kansas minus Kansas City, "Remainder of Missouri" refers to the state of Missouri minus Kansas City and St. Louis, "Remainder of Oklahoma" refers to the state of Oklahoma minus Oklahoma City, etc.

Ideally, we would want to know not only which places have a greater exchange of goods with Kansas City, but also what types of goods are being shipped between Kansas City and other places. While the data does not reveal what commodities are being shipped to particular places, it is possible to make some inferences based on the likelihood that there is an inverse relationship between the weight of a shipment and its value: It appears that the heaviest commodities also tend to have a lower value, since they are often raw materials like metals and coal. Vice versa, commodities that have lower weight tend to have higher values, since they are often finished products such as electronics.

Based on these observations, places that are high in the value of the shipments they send and receive, but low in weight, are likely to be sending or receiving shipments of finished products, while places that send or receive shipments with low value but high weight are likely to be sending or receiving commodities like stone, metals, or coal. For instance, the state of Michigan is the destination of only 0.3 percent of the total weight of Kansas City shipments, but this makes up over 2 percent of the total value, suggesting that Kansas City is shipping finished products to Michigan. In contrast, shipments to Kansas City from Wyoming make up almost 5 percent of the total weight, but only 0.1 percent of the total value, suggesting that Kansas City is receiving raw materials from Wyoming.

Shipment data indicates that there are strong ties between Kansas City and the rest of the Heartland. Overall, 73 percent of the volume of shipments (measured by weight) to and from Kansas City are destined to or originate within the Heartland. In terms of value, the percentage of shipments within the Heartland is lower (42 percent) but still significant. In particular, the states of Missouri, Kansas, Iowa, and Nebraska have a significant exchange of goods with Kansas City both in terms of weight and in terms of value. The states of Oklahoma and Arkansas, on the other hand, are high in weight but low in value, suggesting that the flow of goods between Kansas City and these two states is composed primarily of raw materials.

Figure 34. Shipments Volume in Thousands of Tons, Top 10 States (1997)

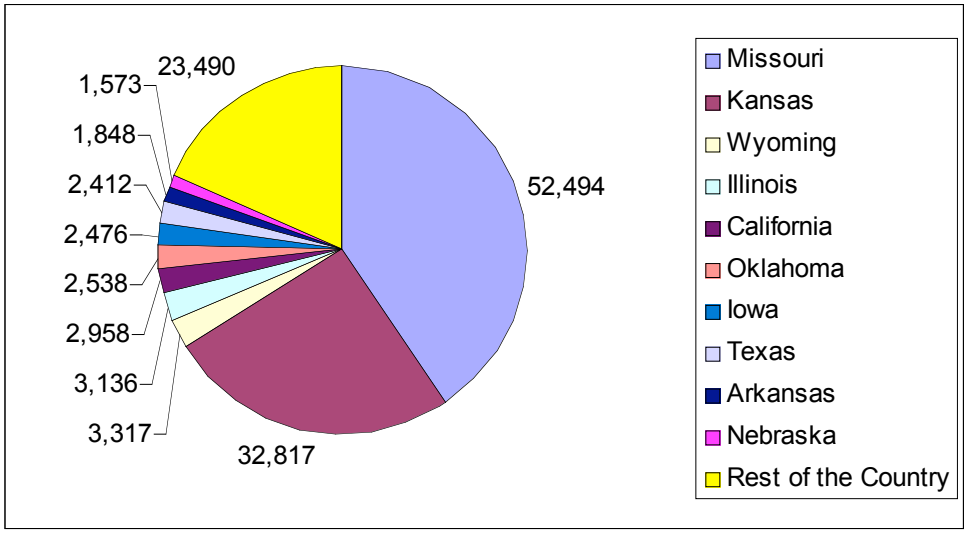
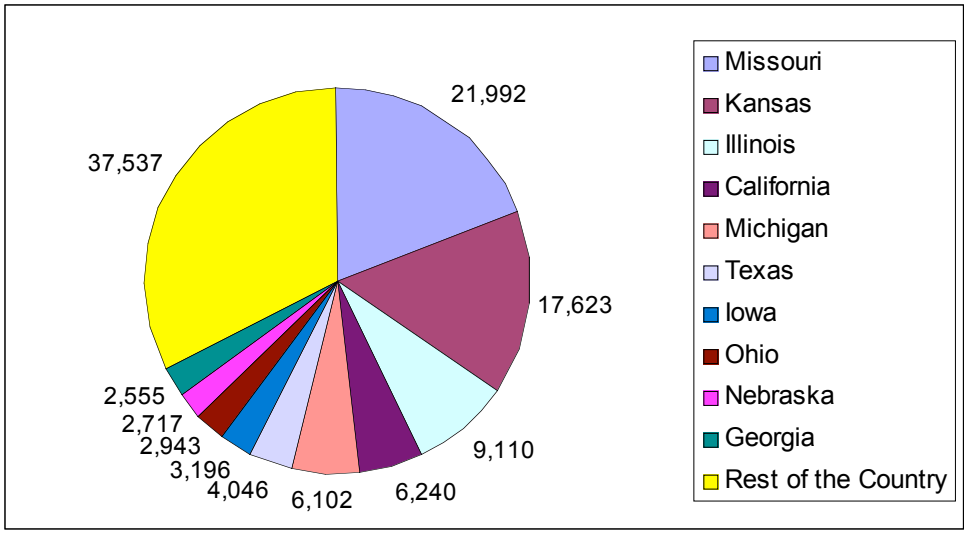


Figure 35. Shipments Value in Millions of Dollars, Top 10 States (1997)



Below the state level, a large share of Heartland shipments remains within the Kansas City metropolitan area boundaries. Fifty percent of the weight and 21 percent of the value of all shipments to and from Kansas City does not leave the metropolitan area. Other areas within the Heartland that are strongly connected to Kansas City (i.e. are high both in terms of weight and in terms of value) are the remainder of Kansas (including Topeka and Wichita), the remainder of Missouri (including Springfield), and St. Louis. Places in Oklahoma (including Tulsa) and in Arkansas (including Little Rock) send and receive a significant share of shipments to and from Kansas City in terms of weight but not in terms of value. For instance, shipments between Kansas City and the state of Oklahoma (not including Oklahoma City) account for 1.8 percent of the total weight of shipments, but only 0.6 percent of their value.

Figure 36. Kansas City Shipments (Weight)

Area	**Tons Shipped (in thousands)**	**Percentage of total Tons shipped**
Remainder of Missouri	9790	7.59%
Remainder of Kansas	9529	7.38%
Remainder of Oklahoma	2307	1.79%
Chicago-Gary-Kenosha, IL-IN-WI CMSA	1922	1.49%
Remainder of California	1306	1.01%
St. Louis, MO-IL MSA (MO part)	1132	0.88%
Remainder of Louisiana	1078	0.84%
Remainder of Texas	1068	0.83%
Detroit-Ann Arbor-Flint, MI CMSA	1000	0.77%
Remainder of North Carolina	919	0.71%

Figure 37. Kansas City Shipments (Value)

Area	Value (in millions of $)	Percent of total value
Chicago-Gary-Kenosha, IL-IN-WI CMSA (IL part)	7,843	6.88%
Remainder of Kansas	7,105	6.23%
Remainder of Missouri	5,205	4.56%
Detroit-Ann Arbor-Flint, MI CMSA	4,814	4.22%
St. Louis, MO-IL MSA (MO part)	2,020	1.77%
Atlanta, GA MSA	1,973	1.73%
Dallas-Fort Worth, TX CMSA	1,893	1.66%
Los Angeles-Riverside-Orange County, CA CMSA	1,881	1.65%
Remainder of Wisconsin	1,555	1.36%
Remainder of Indiana	1,328	1.16%

Beyond the Heartland, Kansas City has strong ties with the states of Illinois, California, and Texas. There also appears to be a significant flow of raw materials between Kansas City and Wyoming, and a flow of finished goods between Kansas City and Michigan.

The strongest connection with places outside of the Heartland is with the Chicago region, which receives the largest share of Kansas City's shipments value. In terms of weight, the flow of goods between Kansas City and Chicago is greater than the flow of goods between Kansas City and the entire states of Arkansas and Nebraska. The firm connectivity data (discussed below) also points to a connection between Kansas City and Chicago, suggesting that the economies of these two metropolitan areas are closely intertwined. Detroit and Los Angeles are also strongly connected to Kansas City. The value of the shipments to and from these areas is significantly higher than their weight, suggesting that the flow of goods between Kansas City and Chicago, Detroit, and Los Angeles is primarily composed of finished goods.

2. Input-Output Linkages

Key Findings:

- Linkages between industries in Kansas City and industries in other Heartland metropolitan areas suggest the presence of integrated regional clusters and economic connections in particular industry sectors.
- The telecommunication industry in Kansas City likely acquires electronic components from Lincoln, Springfield, Omaha, and Oklahoma City.
- The paper manufacturing and printing cluster in Kansas City likely acquires inputs from wood products manufacturing industries located in Little Rock and Wichita.

Every five years, the Bureau of Economic Analysis publishes benchmark Input-output tables that show how industries provide input to and use output from each other to produce gross domestic product. These tables can be used to show the connections and buyer-supplier relationships that link different industries. By combining these tables with

the information on industry concentrations in each city provided by the industry concentration analysis, it is possible to hypothesize specific buyer-supplier relationships between industries in different metropolitan areas across the Heartland.[51]

For example, the input-output table tells us that industry B provides important inputs to industry A. If Kansas City has a disproportionate concentration of industry A, and St. Louis has a disproportionate concentration of industry B, we can hypothesize that industry A in Kansas City acquires its inputs from industry B in St. Louis. While this type of analysis is extremely tentative, it can suggest interesting connections and allow the formulation of more informed hypotheses on the connectivity issue, by pointing out possible connections between industries across metropolitan areas.[52] These preliminary observations can then be examined in detail for particular linkages to identify economic development opportunities.

Input-output data reveals that the telecommunications cluster, one of the largest clusters in Kansas City, is closely connected to the electronic and precision instruments manufacturing cluster, and to the semiconductor and electronic components manufacturing industry in particular. This cluster is concentrated primarily in Lincoln and Tulsa, which have high location quotients relative to the rest of the Heartland and of the nation. This suggests that Kansas City is connected to these cities through buyer-supplier relationships among these clusters.

Wood products manufacturing industries provide key inputs to the paper manufacturing cluster located in Kansas City. Since woods product manufacturing is concentrated in Little Rock and Wichita, paper manufacturing firms in Kansas City are likely to acquire their inputs from these two metropolitan areas.

The linkage between Kansas City and Wichita also extends to the transportation industry, since the transportation and warehousing cluster in Kansas City is likely to acquire inputs from the transportation equipment manufacturing industry concentrated in Wichita.

---

[51] The table used for this analysis is the industry-by-industry total requirements benchmark table from 1997, the latest year for which this table is available. The table shows the production that is required, directly and indirectly, by each industry from all other industries to deliver a dollar worth of product to the final user. In order to formulate hypotheses regarding possible linkages among metropolitan areas we went through a two-step process. First, we identified the industries that provide key inputs to the clusters in Kansas City. Second, we looked at where these industries are concentrated within the Heartland. A similar process was used to identify the locations of the industries that are more likely to acquire inputs from Kansas City firms.

[52] This analysis can also reveal interesting connections between industry clusters within the same metropolitan area. For instance, input output data reveal that two of the main clusters in Kansas City (Paper Manufacturing and Printing and Chemicals Manufacturing) might be closely connected: Chemicals manufacturing provides many inputs to paper manufacturing and printing, and at the same time the converted paper products industry (part of the paper manufacturing and printing cluster) is one of the main input providers to the chemicals manufacturing cluster. The connection between these two clusters is also indicated by the fact that both clusters had negative employment growth over the past few years.

Figure 38. Input-Output Linkages (2001)[53]

Kansas City Cluster			Major Inputs		Input Location	
Cluster	% Empl.	HLQ	Industry	Multiplier	City	HLQ
Telecommunication	3.8%	1.9	Electronic and precision instruments manufacturing	0.026	Lincoln	2.3
					Springfield	2.2
Paper Manufacturing	1.8%	1.4	Wood Products Manufacturing	0.11	Little Rock	3.3
					Wichita	2.1
Transportation and Warehousing	4.1%	1.1	Transportation Equipment Manufacturing	0.144	Wichita	7.9

Similar linkages exist when Kansas City industries provide key inputs to clusters in other metropolitan areas. For instance, metal manufacturing, one of the major clusters in St. Louis, is closely connected to wholesale, transportation, and telecommunication, which are three of Kansas City's most important clusters. At the same time, wholesale trade, which is one of the main clusters in Kansas City, is a key input for a number of other industries concentrated in several Heartland metropolitan areas.[54]

These linkages indicate a degree of interdependence between Kansas City and the surrounding metropolitan areas, since the performance of Kansas City's economy could be affected by changes in the industry base in Springfield, Lincoln, or Wichita. More importantly, these connections suggest possible lines of intervention at the regional level, based on the analysis of integrated industry clusters across the Heartland.[55]

3. Firm Connectivity

Key Findings:

- In the business services sector, Kansas City has strong connections with St. Louis.
- The ties with large metropolitan areas outside of the region (Chicago in particular) are stronger than the ties with other metropolitan areas within the Heartland.
- Firms in banking and financial services and law have particularly strong regional connections.

A different type of economic linkage arises not from the relationships between different firms, as in the case of input-output linkages, but from exchanges within the same firm. When firms locate their offices in different places they create a linkage between those places. Both local economies will be affected by the fate of the same firms, and when multiple firms consistently locate in the same places, the effects might be significant. More importantly, though, the linkage between the two places will be created by the flow

[53] HLQ in the table below refers to Heartland Location Quotient.

[54] The shipment data analyzed above also indicates important connections between Kansas City and California (Los Angeles area in particular) and between Kansas City and the Chicago region. Input-output analysis, combined with cluster data, could reveal what types of economic connections link these areas.

[55] While this type of analysis can help formulate more informed hypotheses, it is not refined enough to provide definitive answers. As explained in more detailed in Section VI, the collection of original data in the form of a business survey would be the most effective way to identify actual connections.

of people and information that connect the offices of the same firm. This is particularly true in the case of knowledge-intensive firms providing business services such as accounting, marketing, legal services, and management services.

The analysis of the location patterns of business services firms is interesting for two other reasons. First, these firms tend to follow their customers, locating branches where other firms are located. The location of business services firms across metropolitan areas can thus reveal connections that go beyond this industry sector. Second, business services is interesting as a sector in and of itself, as this is one of the main clusters in Kansas City. This analysis can reveal what markets are served by Kansas City firms.[56]

Among the Heartland metropolitan areas, St. Louis has by far the strongest connection to Kansas City along this dimension, ranking third in the overall number of branches of firms that are located both in St. Louis and in Kansas City. Oklahoma City also shows a strong connection, considering that it ranks very close to much larger markets like New York or Detroit. Other Heartland cities that are connected to Kansas City are Springfield, Omaha, Wichita, and Tulsa. With the exception of St. Louis and Oklahoma City, though, regional connections in general are not particularly strong. Business services firms that locate in Kansas City tend to locate primarily in other large metropolitan areas outside of the region. This suggests that Kansas City (along with St. Louis and Oklahoma City) serves the surrounding metropolitan areas with respect to these functions. The table below shows the top metropolitan areas based on firm connectivity:

Figure 39. Branches of Business Services Firms also Located in Kansas City (2004)

Metro Area	Number of Branches
Chicago, IL	91
Washington, DC-MD-VA-WV	72
St. Louis, MO-IL	68
Atlanta, GA	49
Los Angeles-Long Beach, CA	43
Dallas, TX	42
Boston, MA-NH	38
Philadelphia, PA-NJ	37
New York, NY	35
Detroit, MI	34
Oklahoma City, OK	33

[56] Borrowing from an idea developed by Robert Lang in "U.S. Cities in the World City Network" (Washington: Brookings Institution, forthcoming), this analysis was conducted by examining the location of branches and headquarters of business services firms that operate in Kansas City. In particular, the project looked at the top firms (based on total number of employees) in Kansas City in accounting, legal services, marketing and advertising, banking and financial services, insurance, computer and software services, and management, marketing, and engineering consulting. For each firm, we looked at where their other offices are located outside of Kansas City, based on 2004 Dun and Bradstreet Marketplace Data. We then compiled a matrix with a metropolitan area in each row and a business services firm in each column, and the number of offices for that firm in that metropolitan area at the intersection of the two. The row totals give us a rough measure of connectivity between Kansas City and all of the other metropolitan areas. This exercise was done for two sets of firms: firms that are headquartered in Kansas City, and firms that have branches in Kansas City. The results for the two sets were not significantly different.

Regional connections between Kansas City and other metropolitan areas in the Heartland are stronger in specific sectors. In the banking and financial services sector, for example, there is a strong connection with St. Louis, Oklahoma City, and Omaha. In the legal services sector regional connections are particularly strong, considering that five Heartland metropolitan areas are among the top ten based on the total number of law firm branches:

Figure 40. Branches of Legal Firms also Located in Kansas City (2004)

Metro Area	Total Number of Branches
St. Louis, MO-IL	13
Washington, DC-MD-VA-WV	5
Orange County, CA	3
Phoenix-Mesa, AZ	3
Springfield, MO	3
Wichita, KS	3
Little Rock-North Little Rock, AR	2
New Orleans, LA	2
Omaha, NE-IA	2
Anchorage, AK	1

D. Summary

Overall, based on this initial analysis, the Heartland does indeed appear to be a fairly cohesive economic region, defined by the functional connections among its varied components (see section V.A.2, above). Not only is the Kansas City economy closely interconnected with the regional economy, but Kansas City does appear to play the role of a regional metropolis, acting as a hub for transportation, business services, and cultural amenities. The metropolitan area is an important node for road and rail infrastructure; the Kansas City airport is the main center in the Heartland for air cargo traffic; and the transportation and warehousing industry in Kansas City in general handles a disproportionate amount of the commodities flowing through the region. Kansas City is also an important regional node in the flow of people, attracting visitors and population from the surrounding metropolitan areas.

The Kansas City metropolitan area is also a crucial node for business in the region. Kansas City houses a disproportionate number of headquarters for mid-size companies, and is an important networking center given its high concentration of business organizations. These functions are supported by a concentration of business services industries and occupations that serve the local and regional market, with strong ties to St. Louis and Oklahoma City in particular.

The roles that Kansas City plays within the Heartland and its economic connections to the region are an important feature of the local economy and its performance. These connections can be leveraged and built upon, and Kansas City can strengthen its economy by strengthening its role in the region. The next section will explore these opportunities in more detail.

VI. Strategic Implications

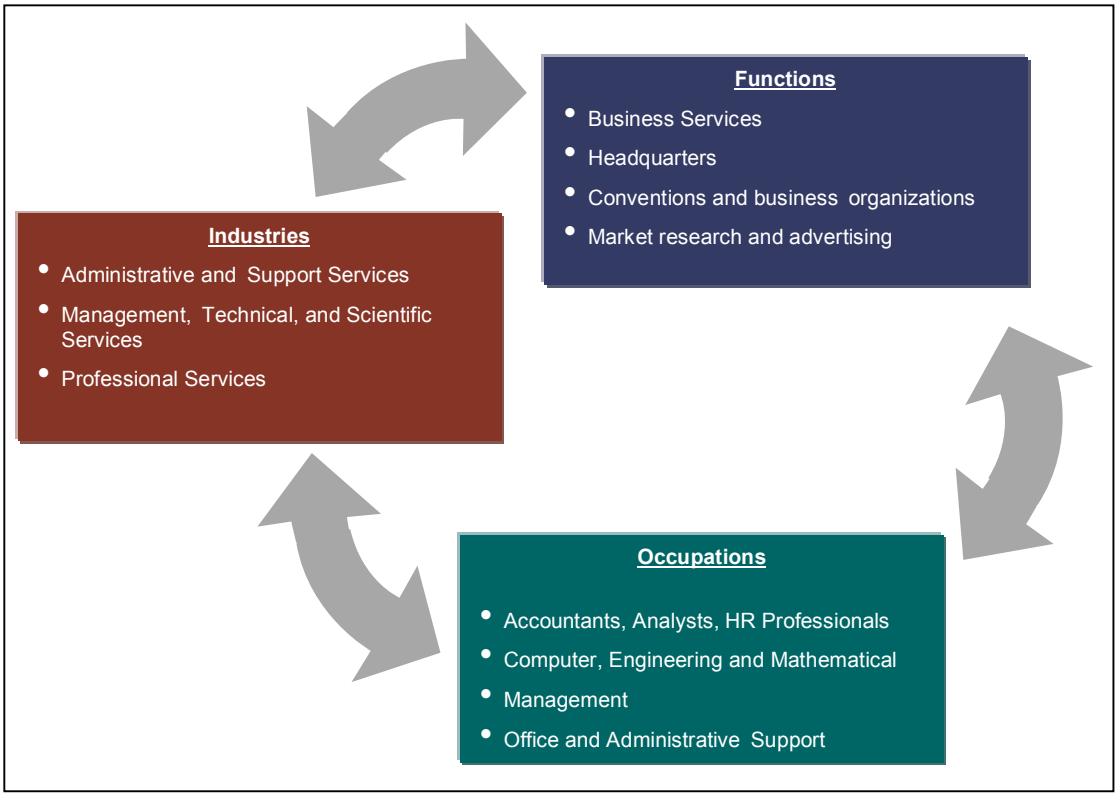
As described at the outset, this preliminary assessment of Kansas City's economy was designed to focus on three critical factors for economic development: the current assets of the local economy, the leading drivers of economic growth, and the relationship of the local economy to the regional economy. The report examined in particular four strategic areas that get at these current strengths, key drivers, and regional connections: industry composition, occupational and functional concentrations, knowledge and innovation, and regional connectivity. These areas are closely interconnected, and economic development opportunities often arise at their nexus or intersection: successful economies are increasingly characterized by knowledge-intensive industries, functions and occupations, connected to regional markets and networks.

From this perspective, Kansas City has substantial core strengths and areas of opportunity. Among the main assets of Kansas City's local economy is a highly educated workforce, employed in key economic functions such as business services, and in information management occupations like market analysis, engineering, and software design. Kansas City also has strong industries that are growing locally and nationally, and that fit well with its role in the regional economy: Key Kansas City industry clusters like telecommunications, wholesale trade, and finance and insurance serve many of the industries located in the Heartland, while Kansas City firms provide important management, technical, legal and scientific services to local and regional businesses. At the same time, though, Kansas City has been losing jobs in important occupation categories such as management and legal.

Overall, the data presented here reveal a promising overlap of industries, functions, and occupations around high-end, information-intensive business services. Kansas City has a concentration of industries such as administrative services, professional services, and management, technical, and scientific services, supported by occupational concentrations such as accountants, analysts, human resources professionals, executives, and software engineers.[57] These industry and occupational concentrations in turn support and complement critical functions such as headquarters, business organizations, and market research and advertising.

[57] As noted in section II, management, technical and scientific services was the third fastest growing "new economy" industry. The bulk of the growth for this industry came from management consulting followed by computer systems design and related services.

Figure 41. Kansas City's Opportunity



This is particularly significant given Kansas City's role as key business center in the Heartland. The regional connectivity analysis in section V revealed that Kansas City houses a disproportionate share of mid-size companies' headquarters in the region and is positioned as an important networking center thanks to its concentration of business and professional organizations. This means that the market for the business services concentration in Kansas City reaches beyond the metropolitan area and includes the whole region.

Kansas City also plays other important roles within the Heartland, offering opportunities for economic growth: Kansas City is a regional metropolis that serves as a transportation node for the goods flowing through the region, and is an important cultural center attracting visitors and population from other metropolitan areas. Kansas City's economy is strongly connected to the region, and the connectivity analysis indicates strong economic ties between Kansas City, St. Louis, and Oklahoma City in particular.

Based on the characteristics of its local economy, Kansas City could be poised to play an important role in the region with respect to innovation as well. The combination of high levels of education and the presence of strong knowledge and business networks indicate an economic environment that could generate innovation and stimulate growth. However, the analysis presented in Section III reveals that Kansas City is lagging in this respect, trailing other metropolitan areas in the region both in terms of patents and venture capital investment.

Given the importance of innovation in today's economy, this lack of innovative capacity poses a serious threat to the continued growth of the Kansas City economy. The absence

of major universities and research institutions, combined with the scarcity of venture capital investments, results in very little R&D activity and even lower levels of commercialization of knowledge. If Kansas City aspires to strengthen its position as a leading center in the Heartland it needs to address this issue and improve its performance with respect to research and innovation.

A. Kansas City: The Place to Do Business

This report is meant to offer only a very preliminary assessment of Kansas City's economy. Substantial additional information and interaction with Kansas City firms is necessary to elaborate a detailed economic development strategy. Nevertheless, it may be useful to draw out one possible development "vision" that strongly emerges from existing concentrations and regional connections, and leverages the unique strengths of the local economy to improve Kansas City's performance.

In order to act upon its overlapping concentrations of industries, functions, and occupations around business services, Kansas City could aspire to create a new, very high-end, cluster around innovative technologies and practices to improve business efficiency, focusing, for example, on services such as information management.[58] It could become the place where professionals and entrepreneurs want to gather to generate new innovations, practices, and enterprises to improve business operational performance, and where businesses want to locate to take advantage of this concentration of expertise and services.

Several coordinated initiatives might move Kansas City along this path. By creating networking opportunities along the lines of Chicago's "First Tuesday" network for IT firms, business leaders could come together and share challenges and best practices. A network of this sort could also facilitate investment in innovative research around efficient business processes and information management.

On a larger scale, a new Business Services Institute could be established. Both networking and innovation would be facilitated as the institute sponsored research initiatives on business processes and infrastructure and facilitated the exchange of ideas and information between researchers and practitioners. The strong connections between this institution and the business community would ensure that the research is guided by real business needs, and ultimately facilitates the application and commercialization of the new knowledge. Such a Business Services Institute would also be a focused, strategic way of enhancing Kansas City's innovation and knowledge activities. Ultimately, this type of initiative would foster innovation, leverage venture capital, and attract young professionals in the field, improving the innovative capacity of the local economy. Moreover, it would be something unique to Kansas City that fits well with its existing economic concentrations as well as with its position in the region.

By building on its educated workforce, its concentrations in business services, and its role as both a headquarter location for smaller companies and a business networking center, Kansas City is well positioned to become the place to do business in the Heartland. A highly networked and focused specialization in business services, supported by research

[58] Two of the fastest growing firms in Kansas City focus on information management, one working on statement processing for mutual funds and the other producing healthcare management software.

and innovation around business efficiency, would translate over time into making Kansas City the place with the best business environment for all types of firms, from entrepreneurship and start up to mid-size companies.[59] This would entail focusing on support services, infrastructure, and knowledge functions that are already a key feature of the local economy. Kansas City could establish itself as an innovative and important business service center for the Heartland and beyond.

B. Next Steps

The idea of Kansas City as a key business services center is just one of many possible, complementary, visions. While the findings presented in this report can help identify such promising areas of intervention, more targeted analysis is necessary to confirm and specify the development opportunity. A few possible next steps are outlined below.

Functional concentrations should be analyzed in more detail, particularly with respect to the intersection between specific functions and industries. It would be important to know whether Kansas City already houses the most desirable, knowledge-intensive functions within its core industries or whether there is room for improvement. It is possible, for example, to have knowledge-intensive industries, but to only have the low-knowledge functions of those industries (e.g. play the warehousing role in the aerospace industry). This information would determine whether Kansas City should seek to attract different functions within the industries it already has, or whether it should pursue a different industry mix.[60]

Additional research is also needed in the area of regional connectivity, since economic linkages among metropolitan areas are extremely difficult to measure. Original data collection would be particularly effective in uncovering specific connections and business relationships across different metropolitan areas in the Heartland. For instance, a fairly simple survey of business owners and CEOs in the Kansas City area could reveal where key inputs come from and what markets are served by Kansas City industries. This additional research could expose the strength and importance of specific connections, and opportunities to build upon them. Are the connections among firms in different metropolitan areas based on trade, information exchange, networking? Which connections are particularly important to the economic performance of Kansas City firms? How can these connections best be expanded and strengthened?

As an alternative to, or in conjunction with, a survey of local businesses, several other steps are possible to further examine the connections illustrated above. First, it would be helpful to go below the cluster level and look at the connections between the individual industries within each cluster. Second, in addition to the input-output and industry concentration information, it would be useful to examine growth trends in employment and earnings, in order to positively identify correlations across industries in different metropolitan areas. This information could be incorporated into a gravity model that

---

[59] As firms are increasingly outsourcing business services functions, the presence of a concentration of industries providing these services would make Kansas City an attractive location for a number of firms across industry sectors.

[60] This type of analysis could be done by examining extensive Public Use Micro-Sample data from the Census Bureau, which reveals not only the presence of occupational and industry concentrations, but also how occupations are distributed across industries in particular places.

would allow us not only to much more specifically identify connections, but also to quantify the "strength" of the linkages that tie together specific industries and places.

The most important next step, however, is to further engage Kansas City business and civic leaders in the examination and of these issues, and in their ultimate implementation. Only the active engagement of the business community can fill out and ground the recommendations, translating this research and development effort into successful new initiatives and ventures, resulting in major economic development outcomes for the Kansas City region.

VII. Conclusion

The picture that emerges from this report shows Kansas City as a strong regional metropolis, characterized by good overall economic performance and important economic connections to the surrounding metropolitan areas. Kansas City's economy has been growing thanks in part to its leading industries (telecommunication, wholesale, business services) and to its highly educated workforce. Despite these positive trends, though, Kansas City is lagging with respect to innovation, and losing ground in important occupational concentrations such as legal and managerial.

Kansas City's opportunity for continued success lies at the intersection of its key industries and functions, core competencies, and regional connections. The report surfaced in particular a strong nexus around high-end business services industries, functions, and occupations, which could be leveraged to improve Kansas City's performance with respect to innovation and economic growth. By building on the key industry sectors and knowledge functions that are already an important feature of the local economy, Kansas City is well positioned to strengthen its role as a regional metropolis for the Heartland and to become a leading place to do business in the national economy.

APPENDIX A. Kansas City Industries Ranked by National Location Quotient (LQ)

	Industry Name	LQ -- Nation	LQ -- Heartland	2001 Emp	98-01 CAGR
Higher than normal	1. Telecommunications	**3.5**	**1.9**	33,915 *	15.9%
	2. Paper Mfg & Printing	**1.6**	**1.4**	16,458	-5.2%
	3. Wholesale Trade	**1.5**	**1.4**	69,566 *	9.0%
	4. Rental & Leasing	**1.3**	**1.1**	6,675	8.3%
	5. Transportation and Warehousing	**1.3**	**1.1**	36,811 *	-0.6%
	6. Finance and Insurance	**1.2**	**1.0**	59,747 *	1.8%
	7. Management, Technical, Scientific Services	**1.2**	**1.3**	23,366 *	12.3%
	8. Real Estate	**1.2**	**1.2**	12,727	9.9%
	9. Civic & Religious Organizations	**1.2**	**1.0**	20,721 *	6.2%
	10. Professional Services	**1.2**	**1.2**	47,233 *	2.3%
	11. Waste Management & Remediation Services	**1.2**	**1.2**	2,766	3.4%
	12. Chemicals Mfg	**1.2**	**1.3**	8,907	-3.9%
	13. Construction Services	**1.1**	**1.1**	57,364 *	4.9%
	14. Primary & Secondary Education	**1.1**	**1.1**	6,228	8.4%
Normal	15. Food and Drinking Establishments	**1.0**	**1.0**	66,626 *	5.8%
	16. Utilities	**1.0**	**1.0**	4,966	4.5%
	17. Retail Trade	**1.0**	**1.0**	112,165 *	0.6%
	18. Business Support Services	**1.0**	**1.0**	67,707 *	32.4%
	19. Personal Services	**1.0**	**0.9**	19,726 *	-1.2%
	20. Publishing & Media	**1.0**	**1.0**	16,142	1.5%
Less than normal	21. Arts, Entertainment, and Recreation	**0.9**	**0.9**	12,839	2.0%
	22. Management of Enterprises	**0.9**	**0.8**	20,729 *	-3.6%
	23. Social Assistance	**0.9**	**0.8**	14,420	4.4%
	24. Construction Materials Mfg	**0.9**	**1.0**	3,645	6.7%
	25. Hotels & Lodging	**0.9**	**1.2**	12,072	-2.1%
	26. Plastics & Rubber Mfg	**0.9**	**0.9**	6,701	0.3%
	27. Health Care	**0.8**	**0.9**	81,448 *	-3.9%
	28. Transport Equipment Mfg	**0.8**	**0.6**	11,157	3.7%
	29. Metal Mfg	**0.8**	**0.8**	22,194 *	-2.8%
	30. Colleges & Universities	**0.7**	**0.8**	8,398	0.1%
	31. Food & Beverage Mfg	**0.7**	**0.7**	8,543	-1.0%
	32. Furniture Mfg	**0.5**	**0.8**	2,499	-5.8%
	33. Electronics & Precision Instruments Mfg	**0.4**	**0.8**	8,375	-7.3%

Notes:
(*) Asterisks used to identify industries with greater than 20,000 employment. Personal Services is rounded up to be 20,000.

APPENDIX B. Kansas City Occupations Ranked by National Location Quotient (LQ)

'03 LQ Status		Occupational Category	2003 Employment	2003 LQ-- National	1999 LQ-- National	Direction of LQ Change
Higher than normal	1.	Computer and Mathematical Science Occupations	28,630	1.4	1.5	↑
	2.	Arts, Design, Entertainment, Sports, and Media Occupations	13,940	1.2	0.9	↑
	3.	Business and Financial Operations Occupations	43,240	1.2	1.2	=
	4.	Legal Occupations	8,350	1.2	2.3	↓
	5.	Architecture and Engineering Occupations	19,800	1.1	0.9	↑
	6.	Office and Administrative Support Occupations	176,680	1.1	1.1	=
	7.	Sales and Related Occupations	105,100	1.1	1.0	↑
	8.	Healthcare Practitioner and Technical Occupations	47,300	1.1	1.0	↑
Normal	9.	Personal Care and Service Occupations	22,650	1.0	0.9	↑
	10.	Management Occupations	50,310	1.0	1.2	↓
	11.	Food Preparation and Serving Related Occupations	75,900	1.0	1.1	↓
	12.	Construction and Extraction Occupations	44,380	1.0	1.0	=
	13.	Installation, Maintenance, and Repair Occupations	37,340	1.0	1.0	=
Less than normal	14.	Transportation and Material Moving Occupations	64,850	0.9	1.0	↓
	15.	Building and Grounds Cleaning and Maintenance Occupations	28,960	0.9	0.8	↑
	16.	Healthcare Support Occupations	21,120	0.9	0.8	↑
	17.	Life, Physical, and Social Science Occupations	7,090	0.9	0.7	↑
	18.	Protective Service Occupations	18,400	0.8	0.8	=
	19.	Production Occupations	62,600	0.8	0.8	=
	20.	Education, Training, and Library Occupations	46,070	0.8	0.8	=
	21.	Community and Social Services Occupations	6,980	0.6	0.7	↓
	22.	Farming, Fishing, and Forestry Occupations	640	0.2	0.2	=

Appendix C. Industry Categories

Cluster Name	1997 NAICS	Description
Agriculture, Forestry, Fishing and Hunting	111	Crop Production
Agriculture, Forestry, Fishing and Hunting	112	Animal Production
Agriculture, Forestry, Fishing and Hunting	113	Forestry and Logging
Agriculture, Forestry, Fishing and Hunting	114	Fishing, Hunting and Trapping
Agriculture, Forestry, Fishing and Hunting	115	Support Activities for Agriculture and Forestry
Arts, Entertainment, and Recreation	711	Performing Arts, Spectator Sports, and Related Industries
Arts, Entertainment, and Recreation	712	Museums, Historical Sites, and Similar Institutions
Arts, Entertainment, and Recreation	713	Amusement, Gambling, and Recreation Industries
Business Support Services	561	Administrative and Support Services
Business Support Services	5142	Data Processing Services
Chemicals Mfg	324	Petroleum and Coal Products Manufacturing
Chemicals Mfg	325	Chemical Manufacturing
Civic & Religious Organizations	8131	Religious Organizations
Civic & Religious Organizations	8132	Grantmaking and Giving Services
Civic & Religious Organizations	8133	Social Advocacy Organizations
Civic & Religious Organizations	8134	Civic and Social Organizations
Colleges & Universities	6112	Junior Colleges
Colleges & Universities	6113	Colleges, Universities, and Professional Schools
Colleges & Universities	6114	Business Schools and Computer and Management Training
Colleges & Universities	6115	Technical and Trade Schools
Construction Materials Mfg	327	Nonmetallic Mineral Product Manufacturing
Construction Services	233	Building, Developing, and General Contracting
Construction Services	234	Heavy Construction
Construction Services	235	Special Trade Contractors
Electronics & Percision Instruments Mfg	334	Computer and Electronic Product Manufacturing
Electronics & Percision Instruments Mfg	335	Electrical Equipment, Appliance, and Component Manufacturing
Electronics & Percision Instruments Mfg	3391	Medical Equipment and Supplies Manufacturing
Finance and Insurance	521	Monetary Authorities - Central Bank
Finance and Insurance	522	Credit Intermediation and Related Activities
Finance and Insurance	523	Securities, Commodity Contracts, and Other Financial Investments & Related Ac
Finance and Insurance	524	Insurance Carriers and Related Activities
Finance and Insurance	525	Funds, Trusts, and Other Financial Vehicles
Food & Beverage Mfg	311	Food Manufacturing
Food & Beverage Mfg	312	Beverage and Tobacco Product Manufacturing
Food and Drinking Establishments	722	Food Services and Drinking Places
Furniture Mfg	337	Furniture and Related Product Manufacturing
Health Care	621	Ambulatory Health Care Services
Health Care	622	Hospitals
Health Care	623	Nursing and Residential Care Facilities
Hotels & Lodging	721	Accommodation
Leather Goods Mfg	316	Leather and Allied Product Manufacturing
Management of Enterprises	551	Management of Companies and Enterprises
Management, Technical, Scientific Services	5415	Computer Systems Design and Related Services
Management, Technical, Scientific Services	5416	Management, Scientific, and Technical Consulting Services
Management, Technical, Scientific Services	5417	Scientific Research and Development Services
Metal Mfg	331	Primary Metal Manufacturing
Metal Mfg	332	Fabricated Metal Product Manufacturing
Metal Mfg	333	Machinery Manufacturing
Mining	211	Oil and Gas Extraction
Mining	212	Mining (except Oil and Gas)
Mining	213	Support Activities for Mining
Other Mfg	3399	Other Miscellaneous Manufacturing
Other Schools	6116	Other Schools and Instruction
Other Schools	6117	Educational Support Services
Paper Mfg & Printing	322	Paper Manufacturing
Paper Mfg & Printing	323	Printing and Related Support Activities

Personal Services	811	Repair and Maintenance
Personal Services	812	Personal and Laundry Services
Plastics & Rubber Mfg	326	Plastics and Rubber Products Manufacturing
Primary & Secondary Education	6111	Elementary and Secondary Schools
Professional Services	5411	Legal Services
Professional Services	5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services
Professional Services	5413	Architectural, Engineering, and Related Services
Professional Services	5418	Advertising and Related Services
Professional Services	5419	Other Professional, Scientific, and Technical Services
Professional Services	8139	Business, Professional, Labor, Political, and Similar Organizations
Publishing & Media	511	Publishing Industries
Publishing & Media	512	Motion Picture and Sound Recording Industries
Publishing & Media	5131	Radio and Television Broadcasting
Publishing & Media	5132	Cable Networks and Program Distribution
Publishing & Media	5141	Information Services
Real Estate	531	Real Estate
Rental & Leasing	532	Rental and Leasing Services
Rental & Leasing	533	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)
Retail Trade	441	Motor Vehicle and Parts Dealers
Retail Trade	442	Furniture and Home Furnishings Stores
Retail Trade	443	Electronics and Appliance Stores
Retail Trade	444	Building Material and Garden Equipment and Supplies Dealers
Retail Trade	445	Food and Beverage Stores
Retail Trade	446	Health and Personal Care Stores
Retail Trade	447	Gasoline Stations
Retail Trade	448	Clothing and Clothing Accessories Stores
Retail Trade	451	Sporting Goods, Hobby, Book, and Music Stores
Retail Trade	452	General Merchandise Stores
Retail Trade	453	Miscellaneous Store Retailers
Retail Trade	454	Nonstore Retailers
Social Assistance	624	Social Assistance
Telecommunications	5133	Telecommunications
Textile & Apparel Mfg	313	Textile Mills
Textile & Apparel Mfg	314	Textile Product Mills
Textile & Apparel Mfg	315	Apparel Manufacturing
Transport Equipment Mfg	336	Transportation Equipment Manufacturing
Transportation and Warehousing	481	Air Transportation
Transportation and Warehousing	482	Rail Transportation
Transportation and Warehousing	483	Water Transportation
Transportation and Warehousing	484	Truck Transportation
Transportation and Warehousing	485	Transit and Ground Passenger Transportation
Transportation and Warehousing	486	Pipeline Transportation
Transportation and Warehousing	487	Scenic and Sightseeing Transportation
Transportation and Warehousing	488	Support Activities for Transportation
Transportation and Warehousing	491	Postal Service
Transportation and Warehousing	492	Couriers and Messengers
Transportation and Warehousing	493	Warehousing and Storage
Utilities	221	Utilities
Waste Management & Remediation Services	562	Waste Management and Remediation Services
Wholesale Trade	421	Wholesale Trade, Durable Goods
Wholesale Trade	422	Wholesale Trade, Nondurable Goods
Wood Products Mfg	321	Wood Product Manufacturing

AeA definition:

High Technology	333295	Semiconductor Machinery
High Technology	333314	Optical Instrument & Lens
High Technology	333315	Photographic & Photocopying Equipment
High Technology	334111	Electronic Computers
High Technology	334112	Computer Storage Devices

High Technology	334113	Computer Terminals
High Technology	334119	Other Computer Peripheral Equipment
High Technology	33421	Telephone Apparatus
High Technology	33422	Radio & TV Broadcasting & Wireless Communications Equipment
High Technology	33429	Other Communications Equipment
High Technology	3344	Semiconductor and Other Electronic Component Manufacturing
High Technology	334510	Electromedical & Electrotherapeutic Apparatus
High Technology	334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical Systems ar
High Technology	334512	Automatic Environmental Controls
High Technology	334513	Industrial Process Control Instruments
High Technology	334514	Totalizing Fluid Meter & Counting Devices
High Technology	334515	Electricity Measuring & Testing Equipment
High Technology	334516	Analytical Laboratory Instruments
High Technology	334517	Irradiation Apparatus
High Technology	334519	Other Measuring & Controlling Instruments
High Technology	335921	Fiber Optic Cables
High Technology	51121	Software Publishers
High Technology	51322	Cable and Other Program Distribution
High Technology	51331	Wired Telecommunications Carriers
High Technology	51332	Wireless Telecommunications Carriers (except Satellite)
High Technology	51333	Telecommunications Resellers
High Technology	51334	Satellite Telecommunications
High Technology	51339	Other Telecommunications
High Technology	54133	Engineering Services
High Technology	54138	Testing Laboratories
High Technology	5415	Computer Systems Design and Related Services
High Technology	54171	Research & Development in the Physical, Engineering, & Life Sciences"
High Technology	61142	Computer Training

California Department of Commerce Definition

Biotechnology		
Biotechnology	325998	Misc. chem'l products and preparation manu.
Biotechnology	331311	Alumina refining
Biotechnology	325131	Inorganic dye & pigment manufacture
Biotechnology	325412	Pharmaceutical preparation manufacture
Biotechnology	32514	Pharmaceutical prep.
Biotechnology	325413	In vitro diagnostic substances
Biotechnology	325414	Biological products, except diagnostic
Biotechnology	32511	Petrochemical manufacture
Biotechnology	325188	Other basic inorganic manufacture
Biotechnology	325193	Ethanol manufacture
Biotechnology	32512	Industrial gas manufacture
Biotechnology	325199	Other basic organic chemicals
Biotechnology	334516	Analytical lab instrument manufacture
Biotechnology	54171	R&D in physical, engineering & life sciences
Biotechnology	54194	Veterinary services
Biotechnology	54138	Testing laboratories

Appendix D. Carnegie Foundation Classification of Kansas City Colleges & Universities

Name	City	State	Ownership	Type
Avila College	Kansas City	MO	Private, not-for-profit	Master's Colleges and Universities I
Calvary Bible College and Theological Seminary	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Theological seminaries and other specialized faith-related institutions
Central Baptist Theological Seminary	Kansas City	KS	Private, not-for-profit	Specialized Institutions—Theological seminaries and other specialized faith-related institutions
Cleveland Chiropractic College of Kansas City	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Other separate health profession schools
DeVry Institute of Technology	Kansas City	MO	Private, for-profit	Baccalaureate Colleges—General
Donnelly College	Kansas City	KS	Private, not-for-profit	Associate's Colleges
Eden Theological Seminary	Webster Groves	MO	Private, not-for-profit	Specialized Institutions—Theological seminaries and other specialized faith-related institutions
Electronics Institute	Kansas City	MO	Private, for-profit	Associate's Colleges
ITT Technical Institute	Earth City	MO	Private, for-profit	Specialized Institutions—Schools of engineering and technology
Johnson County Community College	Overland Park	KS	Public	Associate's Colleges
Kansas City Art Institute	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Schools of art, music, and design
Kansas City Kansas Community College	Kansas City	KS	Public	Associate's Colleges
Linn State Technical College	Linn	MO	Public	Associate's Colleges
Longview Community College	Lee's Summit	MO	Public	Associate's Colleges
Maple Woods Community College	Kansas City	MO	Public	Associate's Colleges
MidAmerica Nazarene University	Olathe	KS	Private, not-for-profit	Master's Colleges and Universities II
Midwestern Baptist Theological Seminary	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Theological seminaries and other specialized faith-related institutions
Nazarene Theological Seminary	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Theological seminaries and other specialized faith-related institutions
Ottawa University	Ottawa	KS	Private, not-for-profit	Baccalaureate Colleges—General
Park College	Parkville	MO	Private, not-for-profit	Master's Colleges and Universities I
Penn Valley Community College	Kansas City	MO	Public	Associate's Colleges
Research College of Nursing	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Other separate health profession schools
Rockhurst University	Kansas City	MO	Private, not-for-profit	Master's Colleges and Universities I
Saint Luke's College	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Other separate health profession schools
Saint Mary College	Leavenworth	KS	Private, not-for-profit	Master's Colleges and Universities I
Saint Paul School of Theology	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Theological seminaries and other specialized faith-related institutions
Sanford-Brown College (No. Kansas City)	No. Kansas City	MO	Private, for-profit	Associate's Colleges
University of Health Sciences, The	Kansas City	MO	Private, not-for-profit	Specialized Institutions—Medical schools and medical centers
University of Kansas Medical Center	Kansas City	KS	Public	Specialized Institutions—Medical schools and medical centers
University of Missouri - Kansas City	Kansas City	MO	Public	Doctoral/Research Universities—Intensive
Vatterott College (Independence)	Independence	MO	Private, for-profit	Associate's Colleges
Webster University	Webster Groves	MO	Private, not-for-profit	Master's Colleges and Universities I
William Jewell College	Liberty	MO	Private, not-for-profit	Baccalaureate Colleges—Liberal Arts

Appendix E. Data Sources

Data Element	Source
Figures 1, 2, 3, and 4	
Employment Share and Employment Growth by Industry	Census Bureau, County Business Patterns, 1998 - 2001 (authors' calculations)
Figure 5	
Employment Growth by Occupation	Bureau of Labor Statistics, Occupational Employment Statistics, 2003
Figure 6	
Educational Attainment of Adult Population	Census Bureau, Census 2000 (authors' calculations)
Figure 7	
Concentration of Knowledge Occupations	Bureau of Labor Statistics, Occupational Employment Statistics, 2003 (authors' calculations)
Figure 8	
Number of Patents	CHI Research, 1999-2003
Number of Scientists and Engineers	Bureau of Labor Statistics, Occupational Employment Statistics, 2003
Figure 9	
Concentration of Patents by Industry	CHI Research, 1999-2003 (authors' calculations)
Figure 10	
Impact of Patents by Industry	CHI Research, 1999-2003 (authors' calculations)
Figure 11	
Classification of Higher Education Institutions in Kansas City, Select MSAs, and the Nation	Carnegie Foundation, Carnegie Classification of Institutions of Higher Education, 2004 revision (authors' tabulations)
Figure 12	
Enrollment and Doctoral Degrees Awarded in Academic Year 2002/2003	National Center for Education Statistics, Integrated Postsecondary Data System (IPEDS), 2003 (authors' tabulations)
Figure 13	
Number of Doctoral Degrees Awarded within Specific Fields of Biological, Physical, Computational Engineering and Sciences* (Academic Year 2002/2003)	National Center for Education Statistics, Integrated Postsecondary Data System (IPEDS), 2003 (authors' tabulations)

Figure 14

R&D Spending	National Science Foundation, 2000
Gross State Product	Bureau of Economic Analysis, 2000

Figure 15

R&D Investment Growth 1993-2000	National Science Foundation, 1993-2000 (authors' calculations)

Figure 16.

R&D funding and performing in Missouri, (1995-2002)	National Science Foundation, 1995-2002 (authors' calculations)

Figure 17

Venture Capital Investment	Pricewaterhouse Coopers, MoneyTree Survey, 1996-2003 (authors' calculations)

Figure 18

[. Population	Census Bureau, Census 2000
Gross Metropolitan Product	William Testa, Thomas Klier, and Alexei Zelenev of the Federal Reserve Bank of Chicago, 2003; based on data from the U.S. Bureau of Economic Analysis
Workforce	Census Bureau, County Business Patterns, 2001
Headquarters	Dun & Bradstreet Marketplace Database, 2004
Air Cargo	ACI North America Airport Traffic Report, 2003
Exports	Census Bureau, Exporter Location Series, 1999

Figure 19 and 20	
Number of Headquarters	Dun & Bradstreet Marketplace Database, 2004
Figure 21	
Headquarters by Industry	Dun & Bradstreet Marketplace Database, 2004 (authors' calculation)
Figure 22	
Employment in Business, Professional, and Labor Organizations	Census Bureau, County Business Patterns, 2001
Figure 23	
Employment in Management Occupations	Census Bureau, Census 2000
Figure 24	
Employment by Occupation	Bureau of Labor Statistics, Occupational Employment Statistics, 2003
Figure 25 and 26	
Cargo Traffic by Airport	ACI North America Airport Traffic Report, 2003
Figure 27 and 28	
Shipments to and from Kansas City, value and weight	Bureau of Transportation Statistics, Commodity Flow Survey, 1997 (authors' calculations)
Figure 29	
Earnings in Transportation and Public Utilities	Bureau of Economic Analysis, Regional Economic Information System (REIS) 2000
Figure 30	
Museums, Number and Rank	Census Bureau, Economic Census, 1997
Figure 31	
Hotels and Motels, Number and Rank	Census Bureau, Economic Census, 1997
Figure 32	
Passenger Traffic by Airport	ACI North America Airport Traffic Report, 2003
Figure 33	
Net Migration to Kansas City, 1993-2000	MARC, "Migration in the Kansas City Area," 2002, available at <www.marc.org>
Figures 34, 35, 36, and 37	
Aggregate Shipments to and from Kansas City, weight and value	Bureau of Transportation Statistics, Commodity Flow Survey, 1997 (authors' calculations)

Figure 38

Percentage Employment	County Business Patterns, 2001
Location Quotients	County Business Patterns, 2001 (authors' calculations)
Multipliers	Bureau of Economic Analysis, Input-Output Accounts, Industry by Industry Total Requirements Benchmark Table, 1997

Figures 39 and 40

Business Service Firms Branches	Dun & Bradstreet Marketplace database, 2004 (authors' calculations)